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Veille scientifique
Maladies tropicales négligées

Semaine 11
13 au 19 mars 2023

Dengue, chikungunya et maladie à virus Zika

Predicting 3D structures and stabilities for complex RNA pseudoknots in ion solutions.

Wang X, Tan YL, Yu S, Shi YZ, Tan ZJ.
15-03-2023
Biophys J.
https://pubmed.ncbi.nlm.nih.gov/36924021/

RNA pseudoknots are a kind of important tertiary motif, and the structures and stabilities of pseudoknots are generally critical to the biological functions of RNAs with the motifs. In this work, we have carefully refined our previously developed coarse-grained model with salt effect through involving a new coarse-grained force field and a replica-exchange Monte Carlo algorithm, and employed the model to predict structures and stabilities of complex RNA pseudoknots in ion solutions beyond minimal H-type pseudoknots. Compared with available experimental data, the newly refined model can successfully predict 3D structures from sequences for the complex RNA pseudoknots including SARS-CoV-2 programming-1 ribosomal frameshifting element and Zika virus xrRNA, and can reliably predict the thermal stabilities of RNA pseudoknots with various sequences and lengths over broad ranges of monovalent/divalent salts. In addition, for complex pseudoknots including SARS-CoV-2 frameshifting element, our analyses show that their thermally unfolding pathways are mainly dependent on the relative stabilities of unfolded intermediate states, in analogy to those of minimal H-type pseudoknots.

The Clinical and Laboratory Profiles of Immunocompetent Patients With Short-Duration Fever With Neutropenia in a Tertiary Care Hospital in Pune, India.

Nimmagadda N, Khillare KM, Satpathy PK, Gowda BS, Narayana V, Gopal P, Tripathy S, Athavale PV.
09-02-2023
Cureus.
https://pubmed.ncbi.nlm.nih.gov/36923173/

A Rare Case of Acute Pancreatitis as Dengue Complication.

Nguyen THT, Nguyen HQ.
06-03-2023
Case Rep Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36922964/

A 31-year-old male was admitted to the hospital because of fever for 2 days. He also had chills, headaches, muscle aches, fatigue, and diarrhea. His vital signs were stable. Dengue virus nonstructural protein 1 (NS1) antigen was positive. Laboratory tests were significant for thrombocytopenia of 67.000/mm^3 and high hematocrit of 45%. On the fifth day of the onset of fever, he experienced sudden epigastric pain. Laboratory results showed elevated serum amylase and lipase. Noncontrast abdominal CT findings were consistent with acute pancreatitis, Balthazar grade D. The patient was managed with supportive care and bowel rest. Two days later, his condition became stable, and he was discharged without complications.

The emergence of an imported variant of dengue virus serotype 2 in the Jazan region, southwestern Saudi Arabia.

Dafalla O, Abdulhaq AA, Almutairi H, Noureldin E, Ghzwani J, Mashi O, Shrwani KJ, Hobani Y, Sufyani O, Ayed R, Alamri A, Al-Mekhlafi HM, Eisa ZM.
15-03-2023
Trop Dis Travel Med Vaccines.
https://pubmed.ncbi.nlm.nih.gov/36922890/

The sex pheromone heptacosane enhances the mating competitiveness of sterile Aedes aegypti males.

Wang LM, Li N, Zhang M, Tang Q, Lu HZ, Zhou QY, Niu JX, Xiao L, Peng ZY, Zhang C, Liu M, Wang DQ, Deng SQ.
15-03-2023
Parasit Vectors.
https://pubmed.ncbi.nlm.nih.gov/36922826/

Blocking NS3-NS4B interaction inhibits dengue virus in non-human primates.

Goethals O, Kaptein SJF, Kesteleyn B, Bonfanti JF, Van Wesenbeeck L, Bardiot D, Verschoor EJ, Verstrepen BE, Fagrouch Z, Putnak JR, Kiemel D, Ackaert O, Straetemans R, Lachau-Durand S, Geluykens P, Crabbe M, Thys K, Stoops B, Lenz O, Tambuyzer L, De Meyer S, Dallmeier K, McCracken MK, Gromowski GD, Rutvisuttinunt W, Jarman RG, Karasavvas N, Touret F, Querat G, de Lamballerie X, Chatel-Chaix L, Milligan GN, Beasley DWC, Bourne N, Barrett ADT, Marchand A, Jonckers THM, Raboisson P, Simmen K, Chaltin P, Bartenschlager R, Bogers WM, Neyts J, Van Loock M.
15-03-2023
Nature.
https://pubmed.ncbi.nlm.nih.gov/36922586/

Toward a global virus genomic surveillance network.

Hill V, Githinji G, Vogels CBF, Bento AI, Chaguza C, Carrington CVF, Grubaugh ND.
06-03-2023
Cell Host Microbe.
https://pubmed.ncbi.nlm.nih.gov/36921604/

The COVID-19 pandemic galvanized the field of virus genomic surveillance, demonstrating its utility for public health. Now, we must harness the momentum that led to increased infrastructure, training, and political will to build a sustainable global genomic surveillance network for other epidemic and endemic viruses. We suggest a generalizable modular sequencing framework wherein users can easily switch between virus targets to maximize cost-effectiveness and maintain readiness for new threats. We also highlight challenges associated with genomic surveillance and when global inequalities persist. We

propose solutions to mitigate some of these issues, including training and multilateral partnerships. Exploring alternatives to clinical sequencing can also reduce the cost of surveillance programs. Finally, we discuss how establishing genomic surveillance would aid control programs and potentially provide a warning system for outbreaks, using a global respiratory virus (RSV), an arbovirus (dengue virus), and a regional zoonotic virus (Lassa virus) as examples.

Differential Expression Patterns of Indoleamine 2,3-Dioxygenase 1 and Other Tryptophan and Arginine Catabolic Pathway Genes in Dengue Correlate with Clinical Severity-Pilot Study Results.

Jose S, Jerome R, Krishnan A, Jagan OA, Li D, Menon V.
15-03-2023
Viral Immunol.
https://pubmed.ncbi.nlm.nih.gov/36921291/

The kynurenine pathway of tryptophan catabolism can modulate inflammatory responses inducing immunotolerance or immunosuppressive effects. Indoleamine 2,3-dioxygenase (IDO) is the rate-limiting enzyme in this pathway. Early aberrant inflammation is implicated in severe dengue, and herein we investigate and characterize the expression of IDO pathway genes in severe dengue patients. We use a SyBR green-based qPCR to evaluate the leukocyte expression levels of *IDO1*, *IDO2*, *AhR*, *TGF-β*, *ARG1*, *IFNγ*, and *IFNα* in a dengue patient cohort (n = 51). Twenty-two cases were identified as severe dengue using the WHO case classification (2009) criteria. Principal component analysis (PCA) was employed to examine the relationships of gene expression profiles with disease severity and laboratory markers of clinical severity. We find that two principal components describe most of the variance (65.3%) in the expression patterns of the cohort. Reduced expression of *IDO1*, *TGF-β*, and *AhR*, represented by low Component 2 scores, was significantly associated with disease severity, thrombocytopenia, and leukopenia. Higher expression levels of *IDO2*, *IFNγ*, and *IFNα* positively correlated with Component 1 scores, and were significantly associated with elevated ALT (p = 0.018) and AST (p = 0.017) enzymes. Our results suggest that profiling the baseline expression patterns of the IDO pathway genes may aid in the identification of dengue patients most at risk of severe disease.

Demographic characteristics, clinical symptoms, biochemical markers and probability of occurrence of severe dengue: A multicenter hospital-based study in Bangladesh.

Yang J, Mosabbir AA, Raheem E, Hu W, Hossain MS.
15-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36921001/

B-cell epitope discovery: The first protein flexibility-based algorithm-Zika virus conserved epitope demonstration.

Biner DW, Grosch JS, Ortoleva PJ.
15-03-2023
PLoS One.
https://pubmed.ncbi.nlm.nih.gov/36920995/

Pseudotyped Virus for Flaviviridae.

Zhang L, Wang X, Ming A, Tan W.
2023
Adv Exp Med Biol.
https://pubmed.ncbi.nlm.nih.gov/36920705/

Members of Flaviviridae are enveloped single positive-stranded RNA viruses including hepacivirus, pestivirus, pegivirus, and mosquito-transmitted flavivirus, which are important pathogens of infectious diseases and pose serious threats to human health. Pseudotyped virus is an artificially constructed virus-like particle, which could infect host cells similar to a live virus but cannot produce infectious progeny virus. Therefore, pseudotyped virus has the advantages of a wide host range, high transfection efficiency, low biosafety risk, and accurate and objective quantification. It has been widely used in biological characteristics, drug screening, detection methods, and vaccine evaluation of Flaviviridae viruses like hepatitis C virus, Japanese encephalitis virus, dengue virus, and Zika virus.

Pseudotyped Viruses for the Alphavirus Chikungunya Virus.

Wu J, Huang W, Wang Y.
2023
Adv Exp Med Biol.
https://pubmed.ncbi.nlm.nih.gov/36920704/

Members of the genus Alphavirus are mostly mosquito-borne pathogens that cause disease in their vertebrate hosts. Chikungunya virus (CHIKV), which is one member of the genus Alphavirus [1], has been a major health problem in endemic areas since its re-emergence in 2006. CHIKV is transmitted to mammalian hosts by the Aedes mosquito, causing persistent debilitating symptoms in many cases. At present, there is no specific treatment or vaccine. Experiments involving live CHIKV need to be performed in BSL-3 facilities, which limits vaccine and drug research. The emergence of pseudotyped virus technology offered the potential for the development of a safe and effective evaluation method. In this chapter, we review the construction and application of pseudotyped CHIKVs, the findings from which have enhanced our understanding of CHIKV. This will, in turn, enable the exploration of promising therapeutic strategies in animal models, with the ultimate aim of developing effective treatments and vaccines against CHIKV and other related viruses.

The chaperone BiP promotes dengue virus replication and mosquito vitellogenesis in Aedes aegypti.

Yeh CT, Weng SC, Tsao PN, Shiao SH.
13-03-2023
Insect Biochem Mol Biol.
https://pubmed.ncbi.nlm.nih.gov/36921733/

Pharmacological Elevation of Cellular Dihydrosphingomyelin Provides a Novel Antiviral Strategy against West Nile Virus Infection.

Jiménez de Oya N, San-Félix A, Casasampere M, Blázquez AB, Mingo-Casas P, Escribano-Romero E, Calvo-Pinilla E, Poderoso T, Casas J, Saiz JC, Pérez-Pérez MJ, Martín-Acebes MA.
15-03-2023
Antimicrob Agents Chemother.
https://pubmed.ncbi.nlm.nih.gov/36920206/

Lessons learnt from the applying the Centers for Disease Control and Prevention (CDC) evaluation framework to the measles incident management system response, USA, 2020-2021.

Jacenko S, Blough S, Grant G, Tohme R, McFarland J, Hatcher C, Goodson JL, Papania M, Pella DG, Li X, Yee SL.
Mar-2023
BMJ Glob Health.
https://pubmed.ncbi.nlm.nih.gov/36918218/

The functionality and performance of public health programmes at all levels of government play a critical role in preventing, detecting, mitigating and responding to public health threats, including infectious disease outbreaks. Multiple and concurrent outbreaks in recent years, such as COVID-19, Ebola and Zika, have highlighted the importance of documenting lessons learnt from public health responses of national and global agencies. In February 2020, the US Centers for Disease Control and Prevention (CDC) Center for Global Health (CGH) activated the Measles Incident Management System (MIMS) to accelerate the ability to detect, mitigate and respond to measles outbreaks globally and advance progress towards regional measles elimination goals. The activation was triggered by a global resurgence in reported measles cases during 2018-2019 and supported emergency response activities conducted by partner organisations and countries. MIMS leadership decided early in the response to form an evaluation team to design and implement an evaluation approach for producing real-time data to document progress of response activities and inform timely decision-making. In this manuscript, we describe how establishing an evaluation unit within MIMS, and engaging MIMS leadership and subject matter experts in the evaluation activities, was critical to monitor progress and document lessons learnt to inform decision making. We also explain the CDC's Framework for Evaluation in Public Health Practice applied to evaluate the dynamic events throughout the MIMS response. Evaluators supporting emergency response should use a flexible framework that can be adaptable in dynamic contexts and document response activities in real-time.

Clinical and Laboratory Characteristics of Hemophagocytic Lymphohistiocytosis in Children With Severe Dengue During the 2019-2020 Outbreak in Southern Colombia.

Restrepo Arias VC, Salgado García DM, Merchán-Galvis AM, Narváez CF.
03-03-2023
Pediatr Infect Dis J.
https://pubmed.ncbi.nlm.nih.gov/36916863/

A live dengue virus vaccine carrying a chimeric envelope glycoprotein elicits dual DENV2-DENV4 serotype-specific immunity.

Young E, Yount B, Pantoja P, Henein S, Meganck RM, McBride J, Munt JE, Baric TJ, Zhu D, Scobey T, Dong S, Tse LV, Martinez MI, Burgos AG, Graham RL, White L, DeSilva A, Sariol CA, Baric RS.
13-03-2023
Nat Commun.
https://pubmed.ncbi.nlm.nih.gov/36914616/

The four dengue virus serotypes co-circulate globally and cause significant human disease. Dengue vaccine development is challenging because some virus-specific antibodies are protective, while others are implicated in enhanced viral replication and more severe disease. Current dengue tetravalent vaccines contain four live attenuated serotypes formulated to theoretically induce balanced protective immunity. Among the number of vaccine candidates in clinical trials, only Dengvaxia is licensed for use in DENV seropositive individuals. To simplify live-virus vaccine design, we identify co-evolutionary constraints inherent in flavivirus virion assembly and design chimeric viruses to replace domain II (EDII) of the DENV2 envelope (E) glycoprotein with EDII from DENV4. The chimeric DENV2/4EDII virus replicates efficiently in vitro and in vivo. In male macaques, a single inoculation of DENV2/4EDII induces type-specific neutralizing antibodies to both DENV2 and DENV4, thereby providing a strategy to simplify DENV vaccine design by utilizing a single bivalent E glycoprotein immunogen for two DENV serotypes.

Ethyl palmitate, an anti-chikungunya virus principle from Sauropus androgynus, a medicinal plant used to alleviate fever in ethnomedicine.

Sagna A, Nair RVR, Hulyalkar N, Rajasekharan S, Nair VTG, Sivakumar KC, Suja SR, Baby S, Sreekumar E.
11-03-2023
J Ethnopharmacol.
https://pubmed.ncbi.nlm.nih.gov/36914036/

Ethnopharmacological relevance: Sauropus androgynus is a medicinal shrub used for the treatment of fever in ethnomedical traditions in various Southeast Asian countries. Aim of the study: This study was aimed to identify antiviral principles from S. androgynus against Chikungunya virus (CHIKV), a major mosquito-borne pathogen that re-emerged in the last decade, and to unravel their mechanism of action. Materials and methods: Hydroalcoholic extract of S. androgynus leaves was screened for anti-CHIKV activity using cytopathic effect (CPE) reduction assay. The extract was subjected to activity guided isolation and the resultant pure molecule was characterized by GC-MS, Co-GC and Co-HPTLC. The

isolated molecule was further evaluated for its effect by plaque reduction assay, Western blot and immunofluorescence assays. In silico docking with CHIKV envelope proteins and molecular dynamics simulation (MD) analyses were used to elucidate its possible mechanism of action. **Results:** S. androgynus hydroalcoholic extract showed promising anti-CHIKV activity and its active component, obtained by activity guided isolation, was identified as ethyl palmitate (EP), a fatty acid ester. At 1 µg/mL, EP led to 100% inhibition of CPE and a significant 3 $\log_{10}$ reduction in CHIKV replication in Vero cells at 48 h post-infection. EP was highly potent with an EC_{50} of 0.0019 µg/mL (0.0068 µM) and a very high selectivity index. EP treatment significantly reduced viral protein expression, and time of addition studies revealed that it acts at the stage of viral entry. A strong binding to the viral envelope protein E1 homotrimer during entry, thus preventing viral fusion, was identified as a possible mechanism by which EP imparts its antiviral effect.

Conclusions: S. androgynus contains EP as a potent antiviral principle against CHIKV. This justifies the use of the plant against febrile infections, possibly caused by viruses, in various ethnomedical systems. Our results also prompt more studies on fatty acids and their derivatives against viral diseases.

Structural basis and dynamics of Chikungunya alphavirus RNA capping by nsP1 capping pores.

Jones R, Hons M, Rabah N, Zamarreño N, Arranz R, Reguera J.
21-03-2023
Proc Natl Acad Sci U S A.
https://pubmed.ncbi.nlm.nih.gov/36913573/

Medicinal Plants with Anti-dengue and Immunomodulatory Activity.

Juan-Pablo BP, David PE, Mónica SR, Ashutosh S, Daniel NA, Dealmy DG, Rubén GG, Sergio-Everardo VG, Agustina RM, María-Del-Carmen VM, Alejandro-David HH, Irais CM.
2023
Curr Pharm Biotechnol.
https://pubmed.ncbi.nlm.nih.gov/35619300/

Systematic Review of the Serotonergic System in the Pathophysiology of Severe Dengue: The Theory of Thrombocytopenia and Vascular Extravasation.

Corzo-Gómez J, Picazo O, Castellanos-Pérez M, Briones-Aranda A.
2023
Mini Rev Med Chem.
https://pubmed.ncbi.nlm.nih.gov/35726421/

Background: Severe dengue is characterized by thrombocytopenia, hemorrhaging, and/or capillary extravasation and may be linked to a reduced plasma concentration of serotonin (5-hydroxytriptamine, or 5-HT). **Objective:** The aim of the current contribution was to conduct a systematic bibliographic review of reports on the role of the peripheral serotonergic system in the pathophysiology of severe dengue. **Methods:** A bibliographic review was carried out of in vivo/in vitro models, clinical trials, and case series studies from 2010-2019. The selective criteria were the use of treatments with serotonin reuptake inhibitors and/or agonists/antagonists of 5-HT receptors and their impact on inflammation, coagulation, and endothelium. Moreover, cross-sectional and cohort studies on the relationship between intraplatelet and plasma 5-HT levels in patients with dengue were also included. The risk of bias in the selected reports was examined with domain-based assessment utilizing Cochrane-type criteria. The main results are summarized in Tables and Figures. **Results:** Based on descriptions of the effect of serotonergic drugs on 5-HT levels and the findings of clinical trials of dengue treatment, most receptors of the peripheral serotonergic system, and especially 5-HT2A, seem to participate in regulating serum 5-HT during severe dengue. Therefore, the peripheral serotonergic system probably contributes to thrombocytopenia and capillary extravasation. **Conclusion:** Regarding dengue, 5-HT may be a key parameter for predicting severity, and an understanding of 5-HT-related mechanisms could possibly facilitate the development of new therapies. These proposals require further research due to the limited number of publications on the role of serotonergic receptors at the peripheral level.

NLRC5 restricts dengue virus infection by promoting the autophagic degradation of viral NS3 through E3 ligase CUL2 (cullin 2).

Hao J, Li J, Zhang Z, Yang Y, Zhou Q, Wu T, Chen T, Wu Z, Zhang P, Cui J, Li YP.
Apr-2023
Autophagy.
https://pubmed.ncbi.nlm.nih.gov/36126167/

Nanovaccines to combat virus-related diseases.

Wu F, Qin M, Wang H, Sun X.
Mar-2023
Wiley Interdiscip Rev Nanomed Nanobiotechnol.
https://pubmed.ncbi.nlm.nih.gov/36184873/

The invention and application of vaccines have made tremendous contributions to fight against pandemics for human beings. However, current vaccines still have shortcomings such as insufficient cellular immunity, the lack of cross-protection, and the risk of antibody-dependent enhancement (ADE). Thus, the prevention and control of pandemic viruses including Ebola Virus, human immunodeficiency virus (HIV), Influenza A viruses, Zika, and current SARS-CoV-2 are still extremely challenging. Nanoparticles with unique physical, chemical, and biological properties, hold promising potentials for the development of ideal vaccines against these viral infections. Moreover, the approval of the first nanoparticle-based mRNA vaccine BNT162b has established historic milestones that greatly inspired the

clinical translation of nanovaccines. Given the safety and extensive application of subunit vaccines, and the rapid rise of mRNA vaccines, this review mainly focuses on these two vaccine strategies and provides an overview of the nanoparticle-based vaccine delivery platforms to tackle the current and next global health challenges. This article is categorized under: Therapeutic Approaches and Drug Discovery > Nanomedicine for Infectious Disease Therapeutic Approaches and Drug Discovery > Emerging Technologies.

Adjusting for misclassification of an exposure in an individual participant data meta-analysis.

de Jong VMT, Campbell H, Maxwell L, Jaenisch T, Gustafson P, Debray TPA.
Mar-2023
Res Synth Methods.
https://pubmed.ncbi.nlm.nih.gov/36200133/

The Impact of COVID-19 Pandemic and Social Distancing on Motor Function and Growth of Children with Congenital Zika Syndrome: A Prospective Cohort Study.

Gama GL, Salvino AS, Tavares JS, Gregorio JGR, Moreira KMA, Amorim MMR, Melo A.
Feb-2023
Dev Neurorehabil.
https://pubmed.ncbi.nlm.nih.gov/36463499/

Dengue fever ophthalmic manifestations: A review and update.

Lucena-Neto FD, Falcão LFM, Moraes ECDS, David JPF, Vieira-Junior AS, Silva CC, de Sousa JR, Duarte MIS, Vasconcelos PFDC, Quaresma JAS.
Mar-2023
Rev Med Virol.
https://pubmed.ncbi.nlm.nih.gov/36658757/

Dengue fever, the most common arbovirus disease, affects an estimated 390 million people annually. Dengue virus (DENV) is an RNA virus of the Flaviviridae family with four different serotypes. Dengue haemorrhagic fever is the deadliest form of dengue infection and is characterised by thrombocytopaenia, hypotension, and the possibility of multi-system organ failure. The mechanism hypothesised for DENV viral replication is intrinsic antibody-dependent enhancement, which refers to Fcγ receptor-mediated viral amplification. This hypothesis suggests that the internalisation of DENV through the Fcγ receptor inhibits antiviral genes by suppressing type-1 interferon-mediated antiviral responses. DENV NS1 antibodies can promote the release of various inflammatory mediators in the nuclear transcription factor pathway (NF-κB-dependent), including monocyte chemoattractant protein (MCP)-1, interleukin (IL)-6, and IL-8. As a result, MCP-1 increases ICAM-1 expression and facilitates leukocyte transmigration. In addition, anti-DENV NS1 antibodies induce endothelial cell apoptosis via a nitric oxide-regulated pathway. A chain reaction involving pre-existing DENV heterotypic antibodies and innate immune cells causes dysfunction in complement system activity and contributes to the action of autoantibodies and anti-endothelial cells, resulting in endothelial cell dysfunction, blood-retinal barrier breakdown, haemorrhage, and plasma leakage. A spectrum of ocular diseases associated with DENV infection, ranging from haemorrhagic to inflammatory manifestations, has been reported in the literature. Although rare, ophthalmic manifestations can occur in both the anterior and posterior segments and are usually associated with thrombocytopenia. The most common ocular complication is haemorrhage. However, ophthalmic complications, such as anterior uveitis and vasculitis, suggest an immune-mediated pathogenesis.

Dengue determinants: Necessities and challenges for universal dengue vaccine development.

Hussain Z, Rani S, Ma F, Li W, Shen W, Gao T, Wang J, Pei R.
Mar-2023
Rev Med Virol.
https://pubmed.ncbi.nlm.nih.gov/36683235/

Electrochemical biosensor detection on respiratory and flaviviruses.

Ang PC, Perumal V, Ibrahim MNM, Adnan R, Mohd Azman DK, Gopinath SCB, Raja PB.
Mar-2023
Appl Microbiol Biotechnol.
https://pubmed.ncbi.nlm.nih.gov/36719432/

Extracellular vesicles from Zika virus-infected cells display viral E protein that binds ZIKV-neutralizing antibodies to prevent infection enhancement.

Zhao F, Xu Y, Liu N, Lv D, Chen Y, Liu Z, Jin X, Xiao M, Lavillette D, Zhong J, Bartenschlager R, Long G.
15-03-2023
EMBO J.
https://pubmed.ncbi.nlm.nih.gov/36734074/

Mosquito-borne flaviviruses including Zika virus (ZIKV) represent a public health problem in some parts of the world. Although ZIKV infection is predominantly asymptomatic or associated with mild symptoms, it can lead to neurological complications. ZIKV infection can also cause antibody-dependent enhancement (ADE) of infection with similar viruses, warranting further studies of virion assembly and the function of envelope (E) protein-specific antibodies. Although extracellular vesicles (EVs) from flavivirus-infected cells have been reported to transmit infection, this interpretation is challenged by difficulties in separating EVs from flavivirions due to their similar biochemical composition and biophysical properties. In the present study, a rigorous EV-virion separation method combining sequential ultracentrifugation and affinity capture was developed to study EVs from ZIKV-infected cells. We find that these EVs do not transmit infection, but EVs display abundant E proteins which have an antigenic landscape similar to that of virions carrying E. ZIKV E-coated EVs attenuate antibody-dependent enhancement mediated by ZIKV E-

specific and DENV-cross-reactive antibodies in both cell culture and mouse models. We thus report an alternative route for Flavivirus E protein secretion. These results suggest that modulation of E protein release via virions and EVs may present a new approach to regulating flavivirus-host interactions.

Zika virus leads to olfactory disorders in mice by targeting olfactory ensheathing cells.

Zhou J, Guan MY, Li RT, Qi YN, Yang G, Deng YQ, Li XF, Li L, Yang X, Liu JF, Qin CF.
Mar-2023
EBioMedicine.
https://pubmed.ncbi.nlm.nih.gov/36739631/

Background: Zika virus (ZIKV) is an emerging arbovirus of the genus flavivirus that is associated with congenital Zika syndrome (CZS) in newborns. A wide range of clinical symptoms including intellectual disability, speech delay, coordination or movement problems, and hearing and vision loss, have been well documented in children with CZS. However, whether ZIKV can invade the olfactory system and lead to post-viral olfactory dysfunction (PVOD) remains unknown. Methods: We investigated the susceptibility and biological responses of the olfactory system to ZIKV infection using mouse models and human olfactory organoids derived from patient olfactory mucosa. Findings: We demonstrate that neonatal mice infected with ZIKV suffer from transient olfactory dysfunction when they reach to puberty. Moreover, ZIKV mainly targets olfactory ensheathing cells (OECs) and exhibits broad cellular tropism colocalizing with small populations of mature/immature olfactory sensory neurons (mOSNs/iOSNs), sustentacular cells and horizontal basal cells in the olfactory mucosa (OM) of immunodeficient AG6 mice. ZIKV infection induces strong antiviral immune responses in both the olfactory mucosa and olfactory bulb tissues, resulting in the upregulation of proinflammatory cytokines/chemokines and genes related to the antiviral response. Histopathology and transcriptomic analysis showed typical tissue damage in the olfactory system. Finally, by using an air-liquid culture system, we showed that ZIKV mainly targets sustentacular cells and OECs and support robust ZIKV replication. Interpretation: Our results demonstrate that olfactory system represents as significant target for ZIKV infection, and that PVOD may be neglected in CZS patients.

The clinical utility of CD163 in viral diseases.

Yap YJ, Wong PF, AbuBakar S, Sam SS, Shunmugarajoo A, Soh YH, Misbah S, Ab Rahman AK.
15-02-2023
Clin Chim Acta.
https://pubmed.ncbi.nlm.nih.gov/36740088/

Vector-Borne and Zoonotic Diseases in the Eastern Mediterranean Region: A Systematic Review.

Fazaludeen Koya S, Abdalla SM, Kodama C, Keita M, Abubakar A.
Mar-2023
J Epidemiol Glob Health.
https://pubmed.ncbi.nlm.nih.gov/36757670/

Background and objective: World Health Organization Eastern Mediterranean Region (WHO EMR) has 40% people in the world in need of humanitarian assistance. This systematic review explores selected vector-borne and zoonotic diseases (VBZDs) of importance to EMR in terms of disease burden across countries and periods, disaggregated across sex, age groups, education levels, income status, and rural/urban areas, related vector or animal source reduction measures, and public health, social and economic impacts and related interventions. Methods: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and reviewed articles in PubMed, Embase, and WHO Global Index Medicus published between 1st of January 2011 and 27th of June 2022. Thirteen VBZDs with at least one reported outbreak in the last five years in the region or prioritized as per previous analysis at the WHO global and regional level and based on expert consultations, were included as part of the analysis. Results: The review included 295 studies-55% on leishmaniasis and dengue combined, and 75% studies from Pakistan, Kingdom of Saudi Arabia, and Iran combined. Hospital-based and nationally representative studies constituted 60% and 10% respectively. Males were predominantly affected in most diseases; children reported high burden of Leishmaniasis, whereas elderly had a higher burden of Dengue Fever and Middle East Respiratory Syndrome. Although very few studies reported on socioeconomic differences in burden, the ones that reported showed higher burden of diseases among the disadvantaged socioeconomic groups such as the poor and the less educated. More than 80% studies reported an increase in burden over the years. Conclusion: The literature is scanty for most of the diseases reviewed and the number of studies from countries with humanitarian challenges is very low. The need for more nationally representative, population-based studies calls for prioritizing research investments.

An innovative insecticidal approach based on plant protease inhibitor and Bt protoxins inhibits trypsin-like activity in zebrafish.

Gonçalves ÍFS, Gomes CS, Almeida Filho LCP, Souza JADCR, Rocha BAM, de Souza PFN, de Freitas Júnior ACV, Carvalho AFU, Farias D.
May-2023
Comp Biochem Physiol C Toxicol Pharmacol.
https://pubmed.ncbi.nlm.nih.gov/36813018/

The Leucaena leucocephala trypsin inhibitor (LTI) + Bacillus thuringiensis (Bt) protoxins mix has been proposed as a novel larvicide agent in order to control the vector mosquito of dengue virus, Aedes aegypti, in their aquatic breeding sites. However, use of this insecticide formulation has raised concerns about its impacts on aquatic biota. In this context, this work aimed to assess the effects of LTI and Bt protoxins, separately or in combination, in zebrafish, in regard to the evaluation of toxicity at early life stages and to the presence of LTI

inhibitory effects on intestinal proteases of this fish. Results showed that LTI and Bt concentrations (250 mg/L, and 0.13 mg/L, respectively), and LTI + Bt mix (250 mg/L + 0.13 mg/L) - 10 times superior to those with insecticidal action - did not cause death nor did it induce morphological changes during embryonic and larval development (3 to 144 h post-fertilization) of zebrafish. Molecular docking analyses highlighted a possible interaction between LTI and zebrafish trypsin, especially through hydrophobic interactions. In concentrations near to those with larvicidal action, LTI (0.1 mg/mL) was able to inhibit in vitro intestinal extracts of trypsin in female and male fish by 83 % and 85 %, respectively, while LTI + Bt mix promoted trypsin inhibition of 69 % in female and 65 % in male ones. These data show that the larvicidal mix can potentially promote deleterious effects to nutrition and survival in non-target aquatic organisms, especially those with trypsin-like dependent protein digestion.

Age distribution of dengue cases in southern Vietnam from 2000 to 2015.

Taurel AF, Luong CQ, Nguyen TTT, Do KQ, Diep TH, Nguyen TV, Cao MT, Hoang TND, Huynh PT, Huynh TKL, Le MH, Nealon J, Moureau A.
24-02-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36827445/

Background: Dengue is the most common vector-borne viral infection. In recent times, an increase in the age of cases with clinical dengue has been reported in the national surveillance system and published literature of Vietnam. This change not only alter the risk of transmission and disease burden in different populations but also will impact for prevention and control strategies. A retrospective study was conducted from 2000 to 2015 in 19 provinces of southern Vietnam to describe the changes in age distribution of dengue cases and circulating serotypes. Methodology/principal findings: The study is a time trend analysis of the data aggregated from the database of dengue surveillance system. The database consisted of clinically diagnosed and laboratory-confirmed cases of dengue in southern Vietnam from 2000 to 2015. In the study period, the mean age of dengue cases increased from 12.2 ± 8.8 years old (y/o) to 16.8 ± 13.3 y/o between 2000 and 2015. Majority of severe cases were observed in the age group of 5-9 y/o and 10-14 y/o. Overall, the mortality and case fatality rates (CFR) were lowest during 2010 to 2015, and all four serotypes of dengue were observed. Conclusions/significance: With the exception of severe form, the age distribution of clinical cases of dengue appears to be shifting towards older age groups. An increase in the mean age of clinical cases of dengue has been observed in southern Vietnam over the past decade, and the highest incidence was observed in age group of 5-14 y/o. All serotypes of dengue were in circulation.

Serum biomarkers and anti-flavivirus antibodies at presentation as indicators of severe dengue.

Bernal C, Ping S, Rojas A, Caballero O, Stittleburg V, de Guillén Y, Langjahr P, Pinsky BA, Von-Horoch M, Luraschi P, Cabral S, Sánchez MC, Torres A, Cardozo F, Waggoner JJ.
27-02-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36848385/

The alphavirus nonstructural protein 2 NTPase induces a host translational shut-off through phosphorylation of eEF2 via cAMP-PKA-eEF2K signaling.

Treffers EE, Tas A, Scholte FEM, de Ru AH, Snijder EJ, van Veelen PA, van Hemert MJ.
27-02-2023
PLoS Pathog.
https://pubmed.ncbi.nlm.nih.gov/36848386/

Evaluation of an Immunoglobulin E Capture Enzyme-Linked Immunosorbent Assay for the Early Diagnosis of Dengue.

Machain-Williams C, Reyes-Solis GC, Blitvich BJ, Laredo-Tiscareño V, Dzul-Rosado AR, Kim S, AbuBakar S.
Mar-2023
Viral Immunol.
https://pubmed.ncbi.nlm.nih.gov/36862827/

Dengue virus (DENV) is the etiological agent of dengue, the most important mosquito-transmitted viral disease of humans worldwide. Enzyme-linked immunosorbent assays (ELISAs) designed to detect DENV IgM are commonly used for dengue diagnosis. However, DENV IgM is not reliably detected until ≥4 days after illness onset. Reverse transcription-polymerase chain reaction (RT-PCR) can diagnose early dengue but requires specialized equipment, reagents, and trained personnel. Additional diagnostic tools are needed. Limited work has been performed to determine whether IgE-based assays can be used for the early detection of vector-borne viral diseases, including dengue. In this study, we determined the efficacy of a DENV IgE capture ELISA for the detection of early dengue. Sera were collected within the first 4 days of illness onset from 117 patients with laboratory-confirmed dengue, as determined by DENV-specific RT-PCR. The serotypes responsible for the infections were DENV-1 and DENV-2 (57 and 60 patients, respectively). Sera were also collected from 113 dengue-negative individuals with febrile illness of undetermined etiology and 30 healthy controls. The capture ELISA detected DENV IgE in 97 (82.9%) confirmed dengue patients and none of the healthy controls. There was a high false positivity rate (22.1%) among the febrile non-dengue patients. In conclusion, we provide evidence that IgE capture assays have the potential to be explored for early diagnosis of dengue, but further research is necessary to address the possible false positivity rate among patients with other febrile illnesses.

Flavivirus nonstructural proteins and replication complexes as antiviral drug targets.

van den Elsen K, Chew BLA, Ho JS, Luo D.
Apr-2023
Curr Opin Virol.
https://pubmed.ncbi.nlm.nih.gov/36870091/

Immunogenicity and safety of concomitant and sequential administration of yellow fever YF-17D vaccine and tetravalent dengue vaccine candidate TAK-003: A phase 3 randomized, controlled study.

Tricou V, Essink B, Ervin JE, Turner M, Escudero I, Rauscher M, Brose M, Lefevre I, Borkowski A, Wallace D.
08-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36888687/

Background: Yellow fever (YF) vaccination is often mandatory for travelers to YF-endemic areas. The areas with risk of YF partially overlap with those of dengue, for which there is currently no recommended vaccine available for dengue-naïve individuals. This phase 3 study assessed the immunogenicity and safety of concomitant and sequential administration of YF (YF-17D) and tetravalent dengue (TAK-003) vaccines in healthy adults aged 18-60 years living in areas of the US non-endemic for either virus. Methods: Participants were randomized 1:1:1 to receive the following vaccinations at Months 0, 3, and 6, respectively: YF-17D+placebo, TAK-003, and TAK-003 (Group 1); TAK-003+placebo, TAK-003, and YF-17D (Group 2); or YF-17D+TAK-003, TAK-003, and placebo (Group 3). The primary objective was to demonstrate non-inferiority (upper bound of 95% confidence interval [UB95%CI] of difference <5%) of YF seroprotection rate one month following concomitant administration of YF-17D and TAK-003 (Group 3) compared with YF-17D plus placebo (Group 1). The secondary objectives included demonstration of non-inferiority of YF and dengue geometric mean titers (GMTs) (UB95%CI for GMT ratio <2.0), and safety. Results: 900 adults were randomized. YF seroprotection rates one month post-YF-17D (Month 1) were 99.5% and 99.1% in Group 1 and 3, respectively, and non-inferiority was demonstrated (UB95%CI = 2.69% i.e. <5%). Non-inferiority was also demonstrated for GMTs against YF one month post-YF-17D, and against DENV-2, -3, and -4 (UB95%CI <2), but not DENV-1 (UB95%CI: 2.22), one month post-second TAK-003 vaccination. Adverse event rates following TAK-003 were consistent with previous results, and no important safety risks were identified. Conclusions: In this study, YF-17D vaccine and TAK-003 were immunogenic and well tolerated when sequentially or concomitantly administered. The non-inferiority of immune responses to YF-17D and TAK-003 was demonstrated for concomitant administration of the 2 vaccines compared to separate vaccination, except against DENV-1 but with GMTs similar to those observed in other TAK-003 trials.

Study of karyotype and constitutive heterochromatin of Mansonia spp. (Diptera: Culicidae) in the area surrounding the Jirau Hydroelectric Dam, Rondônia, Brazil.

Rafael MS, Meireles SDF, Ferreira VDC, Tadei WP, Roque RA.
06-03-2023
Rev Soc Bras Med Trop.
https://pubmed.ncbi.nlm.nih.gov/36888782/

Background: Mansonia mosquitoes transmit arboviruses to humans. This study describes the karyotypes and C-banding of Mansonia humeralis, Mansonia titillans, Mansonia pseudotitillans, and Mansonia indubitans. Methods: From the 202 larvae, the brain ganglia were dissected (n=120) for the preparation of slides. Twenty slides with well-distended chromosomes for each species (10 for karyotyping and 10 for C-banding) were selected for further study. Results: The haploid genome and the average lengths of the chromosomal arms differed in relation to the centromere between species, and intraspecific differences also occurred in the distribution of the C-bands. Conclusions: These results are useful for better understanding of the chromosomal variability of Mansonia mosquitoes.

Diagnostic performance of the rapid test for the detection of NS1 antigen and IgM and IgG anti-antibodies against dengue virus.

Valdivia-Conroy B, Vasquez-Calderón JM, Silva-Caso W, Martins-Luna J, Aguilar-Luis MA, Del Valle-Mendoza J, Puyén ZM.
Oct-Dec 2022
Rev Peru Med Exp Salud Publica.
https://pubmed.ncbi.nlm.nih.gov/36888805/

Rapid molecular assays for the detection of the four dengue viruses in infected mosquitoes.

Ahmed M, Pollak NM, Hugo LE, van den Hurk AF, Hobson-Peters J, Macdonald J.
22-12-2022
Gates Open Res.
https://pubmed.ncbi.nlm.nih.gov/36636741/

Showcasing Environmental Health and Safety Activities During the Coronavirus Disease 2019 Pandemic.

Dothard T, Golston G, Meyer E, Palfrey C, Rasmituth J, Rengarajan K, Richards K, Ruthenborg R, Shartar S, Thomaston SW, Wilkins-Hall CJ.
01-03-2023
Appl Biosaf.
https://pubmed.ncbi.nlm.nih.gov/36895584/

Introduction: Emergency preparedness is not a novel topic. What has been novel is the fast pace at which organizations, including academic institutions, have had to adapt to infectious disease outbreaks since 2000. Objective: The goal of this article is to highlight the various environmental health and safety (EHS) team activities during the coronavirus disease 2019 (COVID-19) pandemic to ensure that on-site personnel was safe, the research could be conducted, and critical business operations such

as academics, laboratory animal care, environmental compliance, and routine healthcare functions could continue during the pandemic. **Methods:** The response framework is presented by discussing first the lessons learned in preparedness and emergency response during outbreaks that occurred since 2000, namely Influenza virus, Zika virus, and Ebola virus. Then, how the response to the COVID-19 pandemic was activated, and the effects of ramping down research and business activities. **Results:** Next, the contributions of each EHS unit are presented, namely, environmental, industrial hygiene and occupational safety, research safety and biosafety, radiation safety, supporting healthcare activities, disinfection, and communications and training. **Discussion:** Lastly, a few lessons learned are shared with the reader for moving toward normalcy.

Differentiating Multisystem Inflammatory Syndrome in Children (MIS-C) and Its Mimics - A Single-Center Experience From a Tropical Setting.

Balasubramanian S, Sankar J, Dhanalakshmi K, Raj SL, Nandakumar D, Ramanan AV, Chandy S.
10-03-2023
Indian Pediatr.
https://pubmed.ncbi.nlm.nih.gov/36896750/

Lymphopenia with Altered T Cell Subsets in Hospitalized COVID-19 Patients in Pune, India.

Suryawanshi P, Takbhate B, Athavale P, Jali P, Memane N, Mirza S, Karandikar M, Kakrani AL, Kanitkar S, Gandham N, Barthwal MS, Dole S, Chaturvedi S, Pawale S, Tripathy A, Bhawalkar JS, Tripathy S.
10-03-2023
Viral Immunol.
https://pubmed.ncbi.nlm.nih.gov/36897333/

Characteristics of the initial dengue outbreaks in a region without dengue prior to mid-2009 in a dengue-endemic country.

Murugananthan K, Coonghe D, Kumanan T, Murugananthan A, Selvaratnam G, Sivansuthan S, Sathiadas G, Ketheesan N, A Careem F, Noordeen F.
28-02-2023
J Infect Dev Ctries.
https://pubmed.ncbi.nlm.nih.gov/36897909/

Introduction: The present study evaluated the characteristics of the initial dengue outbreaks in the Jaffna peninsula, a region without dengue prior to mid-2009 in dengue-endemic Sri Lanka, a tropical island nation. **Methodology:** This is a cross-sectional study conducted using a total of 765 dengue patients' clinical data and samples collected from the Teaching Hospital, Jaffna during the initial dengue outbreaks. Clinical, non-specific, and specific virological laboratory characteristics including the platelet count, NS1 antigen, and anti-DENV IgM/IgG were evaluated as correlates of dengue virus (DENV) infection in the two initial outbreaks of 2009/2010 and 2011/2012 in Northern Sri Lanka. **Results:** Firstly, affected age and clinical characteristics were significantly different between the outbreaks ($p < 0.005$). Secondly, NS1 antigen detection in patients with fever days < 5 was statistically significant ($p < 0.005$). Thirdly, platelet count, detection of NS1 antigen, and anti-DENV IgM/IgG profiles were adequate to diagnose 90% of the patients; hepatomegaly and platelet count of < 25,000/mm3 were identified as predictors of severe disease. Fourthly, secondary DENV infections were detected in the early stages of the illness in many patients. Finally, infecting DENV serotypes were different between the two outbreaks. **Conclusions:** Clinical and non-specific laboratory characteristics and the infecting DENV serotypes between the two initial outbreaks in Northern Sri Lanka were significantly different. NS1 antigen, anti-DENV IgM/IgG, and platelet counts were identified 90% of the dengue patients. Hepatomegaly and platelet count of < 25,000/mm3 were able to predict the disease severity in this study.

Constitutive expression and distinct properties of IFN-epsilon protect the female reproductive tract from Zika virus infection.

Coldbeck-Shackley RC, Romeo O, Rosli S, Gearing LJ, Gould JA, Lim SS, Van der Hoek KH, Eyre NS, Shue B, Robertson SA, Best SM, Tate MD, Hertzog PJ, Beard MR.
10-03-2023
PLoS Pathog.
https://pubmed.ncbi.nlm.nih.gov/36897927/

The immunological surveillance factors controlling vulnerability of the female reproductive tract (FRT) to sexually transmitted viral infections are not well understood. Interferon-epsilon (IFNε) is a distinct, immunoregulatory type-I IFN that is constitutively expressed by FRT epithelium and is not induced by pathogens like other antiviral IFNs α, β and λ. We show the necessity of IFNε for Zika Virus (ZIKV) protection by: increased susceptibility of IFNε-/- mice; their "rescue" by intravaginal recombinant IFNε treatment and blockade of protective endogenous IFNε by neutralising antibody. Complementary studies in human FRT cell lines showed IFNε had potent anti-ZIKV activity, associated with transcriptome responses similar to IFNλ but lacking the proinflammatory gene signature of IFNα. IFNε activated STAT1/2 pathways similar to IFNα and λ that were inhibited by ZIKV-encoded non-structural (NS) proteins, but not if IFNε exposure preceded infection. This scenario is provided by the constitutive expression of endogenous IFNε. However, the IFNε expression was not inhibited by ZIKV NS proteins despite their ability to antagonise the expression of IFNβ or λ. Thus, the constitutive expression of IFNε provides cellular resistance to viral strategies of antagonism and maximises the antiviral activity of the FRT. These results show that the unique spatiotemporal properties of IFNε provides an innate immune surveillance network in the FRT that is a significant barrier to viral infection with important implications for prevention and therapy.

Dengue-Associated Telogen Effluvium Causing Body Dysmorphic Disorder: An Unreported Association.

Hafi B, Uvais NA.
09-03-2023
Prim Care Companion CNS Disord.
https://pubmed.ncbi.nlm.nih.gov/36898035/

Moderation effects of serotype on dengue severity across pregnancy status in Mexico.

Annan E, Nguyen UDT, Treviño J, Wan Yaacob WF, Mangla S, Pathak AK, Nandy R, Haque U.
10-03-2023
BMC Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36899304/

Background: Pregnancy increases a woman's risk of severe dengue. To the best of our knowledge, the moderation effect of the dengue serotype among pregnant women has not been studied in Mexico. This study explores how pregnancy interacted with the dengue serotype from 2012 to 2020 in Mexico. Method: Information from 2469 notifying health units in Mexican municipalities was used for this cross-sectional analysis. Multiple logistic regression with interaction effects was chosen as the final model and sensitivity analysis was done to assess potential exposure misclassification of pregnancy status. Results: Pregnant women were found to have higher odds of severe dengue [1.50 (95% CI 1.41, 1.59)]. The odds of dengue severity varied for pregnant women with DENV-1 [1.45, (95% CI 1.21, 1.74)], DENV-2 [1.33, (95% CI 1.18, 1.53)] and DENV-4 [3.78, (95% CI 1.14, 12.59)]. While the odds of severe dengue were generally higher for pregnant women compared with non-pregnant women with DENV-1 and DENV-2, the odds of disease severity were much higher for those infected with the DENV-4 serotype. Conclusion: The effect of pregnancy on severe dengue is moderated by the dengue serotype. Future studies on genetic diversification may potentially elucidate this serotype-specific effect among pregnant women in Mexico.

Diagnosis of Dengue Virus Infections Imported to Hungary and Phylogenetic Analysis of Virus Isolates.

Nagy O, Nagy A, Koroknai A, Csonka N, Takács M.
24-02-2023
Diagnostics (Basel).
https://pubmed.ncbi.nlm.nih.gov/36900018/

Effectiveness of Dengue Awareness Calendar on Indigenous Population: Impact on Knowledge, Belief and Practice.

Wong LP, Rajandra A, Abd Jamil J, AbuBakar S, Lin Y, Lee HY.
21-02-2023
Healthcare (Basel).
https://pubmed.ncbi.nlm.nih.gov/36900642/

Relationship between Urban Environmental Components and Dengue Prevalence in Dhaka City-An Approach of Spatial Analysis of Satellite Remote Sensing, Hydro-Climatic, and Census Dengue Data.

Kamal ASMM, Al-Montakim MN, Hasan MA, Mitu MMP, Gazi MY, Uddin MM, Mia MB.
21-02-2023
Int J Environ Res Public Health.
https://pubmed.ncbi.nlm.nih.gov/36900868/

Dengue fever is a tropical viral disease mostly spread by the *Aedes aegypti* mosquito across the globe. Each year, millions of people have dengue fever, and many die as a result. Since 2002, the severity of dengue in Bangladesh has increased, and in 2019, it reached its worst level ever. This research used satellite imagery to determine the spatial relationship between urban environmental components (UEC) and dengue incidence in Dhaka in 2019. Land surface temperature (LST), urban heat-island (UHI), land-use-land-cover (LULC), population census, and dengue patient data were evaluated. On the other hand, the temporal association between dengue and 2019 UEC data for Dhaka city, such as precipitation, relative humidity, and temperature, were explored. The calculation indicates that the LST in the research region varies between 21.59 and 33.33 degrees Celsius. Multiple UHIs are present within the city, with LST values ranging from 27 to 32 degrees Celsius. In 2019, these UHIs had a higher incidence of dengue. NDVI values between 0.18 and 1 indicate the presence of vegetation and plants, and the NDWI identifies waterbodies with values between 0 and 1. About 2.51%, 2.66%, 12.81%, and 82% of the city is comprised of water, bare ground, vegetation, and settlement, respectively. The kernel density estimate of dengue data reveals that the majority of dengue cases were concentrated in the city's north edge, south, north-west, and center. The dengue risk map was created by combining all of these spatial outputs (LST, UHI, LULC, population density, and dengue data) and revealed that UHIs of Dhaka are places with high ground temperature and lesser vegetation, waterbodies, and dense urban characteristics, with the highest incidence of dengue. The average yearly temperature in 2019 was 25.26 degrees Celsius. May was the warmest month, with an average monthly temperature of 28.83 degrees Celsius. The monsoon and post-monsoon seasons (middle of March to middle of September) of 2019 sustained higher ambient temperatures (>26 °C), greater relative humidity (>80%), and at least 150 mm of precipitation. The study reveals that dengue transmits faster under climatological circumstances characterized by higher temperatures, relative humidity, and precipitation.

A Deep Learning Approach for Dengue Fever Prediction in Malaysia Using LSTM with Spatial Attention.

Majeed MA, Shafri HZM, Zulkafli Z, Wayayok A.
25-02-2023
Int J Environ Res Public Health.
https://pubmed.ncbi.nlm.nih.gov/36901139/

This research aims to predict dengue fever cases in Malaysia using machine learning techniques. A dataset consisting of weekly dengue cases at the state level in

Malaysia from 2010 to 2016 was obtained from the Malaysia Open Data website and includes variables such as climate, geography, and demographics. Six different long short-term memory (LSTM) models were developed and compared for dengue prediction in Malaysia: LSTM, stacked LSTM (S-LSTM), LSTM with temporal attention (TA-LSTM), S-LSTM with temporal attention (STA-LSTM), LSTM with spatial attention (SA-LSTM), and S-LSTM with spatial attention (SSA-LSTM). The models were trained and evaluated on a dataset of monthly dengue cases in Malaysia from 2010 to 2016, with the task of predicting the number of dengue cases based on various climate, topographic, demographic, and land-use variables. The SSA-LSTM model, which used both stacked LSTM layers and spatial attention, performed the best, with an average root mean squared error (RMSE) of 3.17 across all lookback periods. When compared to three benchmark models (SVM, DT, ANN), the SSA-LSTM model had a significantly lower average RMSE. The SSA-LSTM model also performed well in different states in Malaysia, with RMSE values ranging from 2.91 to 4.55. When comparing temporal and spatial attention models, the spatial models generally performed better at predicting dengue cases. The SSA-LSTM model was also found to perform well at different prediction horizons, with the lowest RMSE at 4- and 5-month lookback periods. Overall, the results suggest that the SSA-LSTM model is effective at predicting dengue cases in Malaysia.

The impact of gastrointestinal tract infection on acquiring dengue fever virus infection and haemorrhagic fever in Jeddah region, Saudi Arabia.

Alghamdi S, Ashshi A, Kabrah A, Atwah B, Alkurbi MO, Assas MB.
30-09-2023
Cell Mol Biol (Noisy-le-grand).
https://pubmed.ncbi.nlm.nih.gov/36905276/

Bioactive Molecules Derived from Plants in Managing Dengue Vector Aedes aegypti (Linn.).

Priya SS, Vasantha-Srinivasan P, Altemimi AB, Keerthana R, Radhakrishnan N, Senthil-Nathan S, Kalaivani K, Chandrasekar N, Karthi S, Ganesan R, Alkanan ZT, Pal T, Verma OP, Proćków J.
05-03-2023
Molecules.
https://pubmed.ncbi.nlm.nih.gov/36903635/

Mosquitoes are the potential vectors of several viral diseases such as filariasis, malaria, dengue, yellow fever, Zika fever and encephalitis in humans as well as other species. Dengue, the most common mosquito-borne disease in humans caused by the dengue virus is transmitted by the vector *Ae. aegypti*. Fever, chills, nausea and neurological disorders are the frequent symptoms of Zika and dengue. Thanks to various anthropogenic activities such as deforestation, industrialized farming and poor drainage facilities there has been a significant rise in mosquitoes and vector-borne diseases. Control measures such as the destruction of mosquito breeding places, a reduction in global warming, as well as the use of natural and chemical repellents, mainly DEET, picaridin, temephos and IR-3535 have proven to be effective in many instances. Although potent, these chemicals cause swelling, rashes, and eye irritation in adults and children, and are also toxic to the skin and nervous system. Due to their shorter protection period and harmful nature towards non-target organisms, the use of chemical repellents is greatly reduced, and more research and development is taking place in the field of plant-derived repellents, which are found to be selective, biodegradable and harmless to non-target species. Many tribal and rural communities across the world have been using plant-based extracts since ancient times for various traditional and medical purposes, and to ward off mosquitoes and various other insects. In this regard, new species of plants are being identified through ethnobotanical surveys and tested for their repellency against *Ae. aegypti*. This review aims to provide insight into many such plant extracts, essential oils and their metabolites, which have been tested for their mosquitocidal activity against different life cycle forms of *Ae. Aegypti*, as well as for their efficacy in controlling mosquitoes.

Evaluation of analgesic and prophylactic activity of Curcumin against chikungunya-infected acute/chronic arthralgic mice.

Sengupta S, Tripathi A.
10-03-2023
J Med Virol.
https://pubmed.ncbi.nlm.nih.gov/36905112/

AT-752 targets multiple sites and activities on the Dengue virus replication enzyme NS5.

Feracci M, Eydoux C, Fattorini V, Lo Bello L, Gauffre P, Selisko B, Sutto-Ortiz P, Shannon A, Xia H, Shi PY, Noel M, Debart F, Vasseur JJ, Good S, Lin K, Moussa A, Sommadossi JP, Chazot A, Alvarez K, Guillemot JC, Decroly E, Ferron F, Canard B.
09-03-2023
Antiviral Res.
https://pubmed.ncbi.nlm.nih.gov/36905944/

First report of natural Wolbachia infections in mosquitoes from Cuba.

Ruiz A, Gutiérrez-Bugallo G, Rodríguez-Roche R, Pérez L, González-Broche R, Piedra LA, Martínez LC, Menéndez Z, Vega-Rúa A, Bisset JA.
10-03-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36907292/

Mosquitoes are extensively responsible for the transmission of pathogens. Novel strategies using Wolbachia could transform that scenario, since these bacteria manipulate mosquito reproduction, and can confer a pathogen transmission-blocking phenotype in culicids. Here, we screened the Wolbachia surface protein region by PCR in eight Cuban mosquito species. We confirmed the natural infections by sequencing and

assessed the phylogenetic relationships among the Wolbachia strains detected. We identified four Wolbachia hosts: Aedes albopictus, Culex quinquefasciatus, Mansonia titillans, and Aedes mediovittatus (first report worldwide). Knowledge of Wolbachia strains and their natural hosts is essential for future operationalization of this vector control strategy in Cuba.

Dengue virus and its recent outbreaks: current scenario and counteracting strategies.

Sah R, Siddiq A, Padhi BK, Mohanty A, Rabaan AA, Chandran D, Chakraborty C, Dhama K.
02-03-2023
Int J Surg.
https://pubmed.ncbi.nlm.nih.gov/36906765/

Isolation of Cells from Glioblastoma Multiforme Grade 4 Tumors for Infection with Zika Virus prME and ME Pseudotyped HIV-1.

Pöhlking C, Beier S, Formanski JP, Friese M, Schreiber M, Schwalbe B.
24-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36901897/

Transcriptome Analysis of Response to Zika Virus Infection in Two Aedes albopictus Strains with Different Vector Competence.

Jia N, Jiang Y, Jian X, Cai T, Liu Q, Liu Y, Xing D, Dong Y, Guo X, Zhao T.
21-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36901688/

Inapparent infections shape the transmission heterogeneity of dengue.

Vazquez-Prokopec GM, Morrison AC, Paz-Soldan V, Stoddard ST, Koval W, Waller LA, Alex Perkins T, Lloyd AL, Astete H, Elder J, Scott TW, Kitron U.
31-01-2023
PNAS Nexus.
https://pubmed.ncbi.nlm.nih.gov/36909820/

Transmission heterogeneity, whereby a disproportionate fraction of pathogen transmission events result from a small number of individuals or geographic locations, is an inherent property of many, if not most, infectious disease systems. For vector-borne diseases, transmission heterogeneity is inferred from the distribution of the number of vectors per host, which could lead to significant bias in situations where vector abundance and transmission risk at the household do not correlate, as is the case with dengue virus (DENV). We used data from a contact tracing study to quantify the distribution of DENV acute infections within human activity spaces (AS), the collection of residential locations an individual routinely visits, and quantified measures of virus transmission heterogeneity from two consecutive dengue outbreaks (DENV-4 and DENV-2) that occurred in the city of Iquitos, Peru. Negative-binomial distributions and Pareto fractions showed evidence of strong overdispersion in the number of DENV infections by AS and identified super-spreading units (SSUs): i.e. AS where most infections occurred. Approximately 8% of AS were identified as SSUs, contributing to more than 50% of DENV infections. SSU occurrence was associated more with DENV-2 infection than with DENV-4, a predominance of inapparent infections (74% of all infections), households with high *Aedes aegypti* mosquito abundance, and high host susceptibility to the circulating DENV serotype. Marked heterogeneity in dengue case distribution, and the role of inapparent infections in defining it, highlight major challenges faced by reactive interventions if those transmission units contributing the most to transmission are not identified, prioritized, and effectively treated.

Humoral and T-cell-mediated responses to a pre-clinical Zika vaccine candidate that utilizes a unique insect-specific flavivirus platform.

Porier DL, Adam A, Kang L, Michalak P, Tupik J, Santos MA, Lee C, Allen IC, Wang T, Auguste AJ.
01-03-2023
bioRxiv.
https://pubmed.ncbi.nlm.nih.gov/36909623/

Vaccination is critical for the control and prevention of viral outbreaks, yet conventional vaccine platforms may involve trade-offs between immunogenicity and safety. Insect-specific viruses have emerged as a novel vaccine platform to overcome this challenge. Detailed studies of humoral and T-cell responses induced by new insect-specific flavivirus (ISFV)-based vaccine platforms are needed to better understand correlates of protection and improve vaccine efficacy. Previously, we used a novel ISFV called Aripo virus (ARPV) to create a Zika virus (ZIKV) vaccine candidate (designated ARPV/ZIKV). ARPV/ZIKV demonstrated exceptional safety and single-dose efficacy, completely protecting mice from a lethal ZIKV challenge. Here, we explore the development of immune responses induced by ARPV/ZIKV immunization and evaluate its correlates of protection. Passive transfer of ARPV/ZIKV-induced immune sera to naïve mice prior to challenge emphasized the importance of neutralizing antibodies as a correlate of protection. Depletion of T-cells in vaccinated mice and adoptive transfer of ARPV/ZIKV-primed T-cells to naïve mice prior to challenge indicated that ARPV/ZIKV-induced $CD4^+$ and $CD8^+$ T-cell responses contribute to the observed protection but may not be essential for protection during ZIKV challenge. However, vaccination of Rag1 KO, Tcra KO, and $muMt^-$ mice demonstrated the critical role for ARPV/ZIKV-induced T-cells in developing protective immune responses following vaccination. Overall, both humoral and T-cell-mediated responses induced by ISFV-based vaccines are important for comprehensive immunity, and ISFV platforms continue to be a promising method for future vaccine development.

A Case Report on CNS Hemophagocytic Lymphohistiocytosis in an Infant With Dengue Hemorrhagic Fever.

Arora A, Verma S, Khot N, Chalipat S, Agarkhedkar S, Kiruthiga KG.
08-02-2023
Cureus.
https://pubmed.ncbi.nlm.nih.gov/36909089/

Zika Virus: A Systematic Review of Teratogenesis, Congenital Anomalies, and Child Mortality.

Guerrero Saldivia SE, Unnikrishnan S, Chavarria YY, Akindele AO, Jalkh AP, Eastmond AK, Shetty C, Rizvi SMHA, Sharaf J, Williams KD, Tariq M, Acharekar MV, Balani P.
07-02-2023
Cureus.
https://pubmed.ncbi.nlm.nih.gov/36909038/

Zika virus infection (ZIKV) was one of the most catastrophic epidemics. ZIKV in nonpregnant women is mild and sometimes asymptomatic. However, infection during pregnancy leads to congenital malformations in the fetus, while maternal signs of infection are preceded by a rash. The maternal-fetal infection begins with a rash that occurs early during pregnancy. The most severe pathologies were related to the first trimester of gestation, including microcephaly, musculoskeletal, genitourinary, craniofacial, ocular, and pulmonary manifestations. The prognosis may not be encouraging. Herd immunity increases $CD8^+$ (cytotoxic T-lymphocytes) earlier and decreases in the resolution phase. However, $CD4^+$ (T-helper cells) remains higher after infection. Recent ongoing vaccine development shows good immunity, control of the vector (Aedes mosquitoes), and treatment. ZIKV, anomalies, mortality, herd immunity, and vaccine were our main keywords. This systematic review demonstrates the teratogenesis of ZIKV in children, congenital anomalies, mortality, and a view of the future and behavior of ZIKV.

Human microglial models to study host-virus interactions.

McMillan RE, Wang E, Carlin AF, Coufal NG.
11-03-2023
Exp Neurol.
https://pubmed.ncbi.nlm.nih.gov/36907350/

Electrochemical Characterisation and Confirmation of Antioxidative Properties of Ivermectin in Biological Medium.

Selaković M, Aleksić MM, Kotur-Stevuljević J, Rupar J, Ivković B.
24-03-2023
Molecules.
https://pubmed.ncbi.nlm.nih.gov/36903359/

Comparative mutational analysis of the Zika virus genome from different geographical locations and its effect on the efficacy of Zika virus-specific neutralizing antibodies.

Aziz A, Suleman M, Shah A, Ullah A, Rashid F, Khan S, Iqbal A, Luo S, Xie L, Xie Z.
22-02-2023
Front Microbiol.
https://pubmed.ncbi.nlm.nih.gov/36910181/

The Zika virus (ZIKV), which originated in Africa, has become a significant global health threat. It is an RNA virus that continues to mutate and accumulate multiple mutations in its genome. These genetic changes can impact the virus's ability to infect, cause disease, spread, evade the immune system, and drug resistance. In this study genome-wide analysis of 175 ZIKV isolates deposited at the National Center for Biotechnology Information (NCBI), was carried out. The comprehensive mutational analysis of these isolates was carried out by DNASTAR and Clustal W software, which revealed 257 different substitutions at the proteome level in different proteins when compared to the reference sequence (KX369547.1). The substitutions were capsid (17/257), preM (17/257), envelope (44/257), NS1 (34/257), NS2A (30/257), NS2B (11/257), NS3 (37/257), NS4A (6/257), 2K (1/257), NS4B (15/257), and NS5 (56/257). Based on the coexisting mutational analysis, the MN025403.1 isolate from Guinea was identified as having 111 substitutions in proteins and 6 deletions. The effect of coexisting/reoccurring mutations on the structural stability of each protein was also determined by I-mutant and MUpro online servers. Furthermore, molecular docking and simulation results showed that the coexisting mutations (I317V and E393D) in Domain III (DIII) of the envelope protein enhanced the bonding network with ZIKV-specific neutralizing antibodies. This study, therefore, highlighted the rapid accumulation of different substitutions in various ZIKV proteins circulating in different geographical regions of the world. Surveillance of such mutations in the respective proteins will be helpful in the development of effective ZIKV vaccines and neutralizing antibody engineering.

Learning meaningful latent space representations for patient risk stratification: Model development and validation for dengue and other acute febrile illness.

Hernandez B, Stiff O, Ming DK, Ho Quang C, Nguyen Lam V, Nguyen Minh T, Nguyen Van Vinh C, Nguyen Minh N, Nguyen Quang H, Phung Khanh L, Dong Thi Hoai T, Dinh The T, Huynh Trung T, Wills B, Simmons CP, Holmes AH, Yacoub S, Georgiou P; Vietnam ICU Translational Applications Laboratory (VITAL) investigators.
22-02-2023
Front Digit Health.
https://pubmed.ncbi.nlm.nih.gov/36910574/

Infection with chikungunya virus confers heterotypic cross-neutralizing antibodies and memory B-cells against other arthritogenic alphaviruses predominantly through the B domain of the E2 glycoprotein.

Powers JM, Lyski ZL, Weber WC, Denton M, Streblow MM, Mayo AT, Haese NN, Nix CD, Rodríguez-Santiago R, Alvarado LI, Rivera-Amill V, Messer WB, Streblow DN.
13-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36913428/

Development of a machine learning model for early prediction of plasma leakage in suspected dengue patients.

Zargari Marandi R, Leung P, Sigera C, Murray DD, Weeratunga P, Fernando D, Rodrigo C, Rajapakse S, MacPherson CR.
13-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36913411/

Background: At least a third of dengue patients develop plasma leakage with increased risk of life-threatening complications. Predicting plasma leakage using laboratory parameters obtained in early infection as means of triaging patients for hospital admission is important for resource-limited settings. Methods: A Sri Lankan cohort including 4,768 instances of clinical data from N = 877 patients (60.3% patients with confirmed dengue infection) recorded in the first 96 hours of fever was considered. After excluding incomplete instances, the dataset was randomly split into a development and a test set with 374 (70%) and 172 (30%) patients, respectively. From the development set, five most informative features were selected using the minimum description length (MDL) algorithm. Random forest and light gradient boosting machine (LightGBM) were used to develop a classification model using the development set based on nested cross validation. An ensemble of the learners via average stacking was used as the final model to predict plasma leakage. Results: Lymphocyte count, haemoglobin, haematocrit, age, and aspartate aminotransferase were the most informative features to predict plasma leakage. The final model achieved the area under the receiver operating characteristics curve, AUC = 0.80 with positive predictive value, PPV = 76.9%, negative predictive value, NPV = 72.5%, specificity = 87.9%, and sensitivity = 54.8% on the test set. Conclusion: The early predictors of plasma leakage identified in this study are similar to those identified in several prior studies that used non-machine learning based methods. However, our observations strengthen the evidence base for these predictors by showing their relevance even when individual data points, missing data and non-linear associations were considered. Testing the model on different populations using these low-cost observations would identify further strengths and limitations of the presented model.

SOCS2 regulates alveolar bone loss in Aggregatibacter actinomycetemcomitans-induced periodontal disease.

Santos MRG, Chaves IM, Queiroz-Junior CM, Cramer AT, Anestino TA, Dos Santos ACPM, Leite PG, Macari S, Barrioni BR, Pereira MM, Teixeira MM, de Souza DDG, Madeira MFM, Machado FS.
13-03-2023
Inflamm Res.
https://pubmed.ncbi.nlm.nih.gov/36912916/

Tackling chikungunya and dengue crisis in Paraguay amidst COVID-19: an epidemiological alert - a correspondence.

Sadiq SUR, Eneh SC, Nazir A, Mustapha MJ, Saleem F, Nazir A, Uwishema O.
14-03-2023
Int J Surg.
https://pubmed.ncbi.nlm.nih.gov/36912892/

Ligand-based pharmacophore modeling and QSAR approach to identify potential dengue protease inhibitors.

Poola AA, Prabhu PS, Murthy TPK, Murahari M, Krishna S, Samantaray M, Ramaswamy A.
23-02-2023
Front Mol Biosci.
https://pubmed.ncbi.nlm.nih.gov/36911525/

The viral disease dengue is transmitted by the Aedes mosquito and is commonly seen to occur in the tropical and subtropical regions of the world. It is a growing public health concern. To date, other than supportive treatments, there are no specific antiviral treatments to combat the infection. Therefore, finding potential compounds that have antiviral activity against the dengue virus is essential. The NS2B-NS3 dengue protease plays a vital role in the replication and viral assembly. If the functioning of this protease were to be obstructed then viral replication would be halted. As a result, this NS2B-NS3 proves to be a promising target in the process of anti-viral drug design. Through this study, we aim to provide suggestions for compounds that may serve as potent inhibitors of the dengue NS2B-NS3 protein. Here, a ligand-based pharmacophore model was generated and the ZINC database was screened through ZINCPharmer to identify molecules with similar features. 2D QSAR model was developed and validated using reported 4-Benzyloxy Phenyl Glycine derivatives and was utilized to predict the IC50 values of unknown compounds. Further, the study is extended to molecular docking to investigate interactions at the active pocket of the target protein. ZINC36596404 and ZINC22973642 showed a predicted pIC50 of 6.477 and 7.872, respectively. They also showed excellent binding with NS3 protease as is evident from their binding energy of -8.3and -8.1 kcal/mol, respectively. ADMET predictionsofcompounds have shown high drug-likeness. Finally, the molecular dynamic simulations integrated with MM-PBSA binding energy calculations confirmedboth identified ZINC compounds as potential hit moleculeswith good stability.

Recent outbreak of zika virus in India amid ongoing COVID-19 and monkeypox outbreak: A call for action.

Sah R, Mohanty A, Paul D, Padhi BK.
14-03-2023
Int J Surg.

https://pubmed.ncbi.nlm.nih.gov/36912540/

Introduction: The role of suppressor of cytokine signaling 2 (SOCS2) in Aggregatibacter actinomycetemcomitans (Aa)-induced alveolar bone loss is unknown; thus, it was investigated in this study. Methods: Alveolar bone loss was induced by infecting C57BL/6 wild-type (WT) and Socs2-knockout (Socs2$^{-/-}$) mice with Aa. Bone parameters, bone loss, bone cell counts, the expression of bone remodeling markers, and cytokine profile were evaluated by microtomography, histology, qPCR, and/or ELISA. Bone marrow cells (BMC) from WT and Socs2$^{-/-}$ mice were differentiated in osteoblasts or osteoclasts for analysis of the expression of specific markers. Results: Socs2$^{-/-}$ mice intrinsically exhibited irregular phenotypes in the maxillary bone and an increased number of osteoclasts. Upon Aa infection, SOCS2 deficiency resulted in the increased alveolar bone loss, despite decreased proinflammatory cytokine production, in comparison to the WT mice. In vitro, SOCS2 deficiency resulted in the increased osteoclasts formation, decreased expression of bone remodeling markers, and proinflammatory cytokines after Aa-LPS stimulus. Conclusions: Collectively, data suggest that SOCS2 is a regulator of Aa-induced alveolar bone loss by controlling the differentiation and activity of bone cells, and proinflammatory cytokines availability in the periodontal microenvironment and an important target for new therapeutic strategies. Thus, it can be helpful in preventing alveolar bone loss in periodontal inflammatory conditions.

Climate change and the displaced person: how vectors and climate are changing the landscape of infectious diseases among displaced and migrant populations.

Choi SH, Beer J, Charrow A.
13-03-2023
Int J Dermatol.
https://pubmed.ncbi.nlm.nih.gov/36912708/

Rage

A Ventromedial Prefrontal-to-Lateral Entorhinal Cortex Pathway Modulates the Gain of Behavioral Responding During Threat.

Hisey E, Purkey A, Gao Y, Hossain K, Soderling SH, Ressler KJ.
19-01-2023
Biol Psychiatry.
https://pubmed.ncbi.nlm.nih.gov/36925415/

Background: The ability to correctly associate cues and contexts with threat is critical for survival, and the inability to do so can result in threat-related disorders such as posttraumatic stress disorder. The prefrontal cortex (PFC) and hippocampus are well known to play critical roles in cued and contextual threat memory processing. However, the circuits that mediate prefrontal-hippocampal modulation of context discrimination during cued threat processing are less understood. Here, we demonstrate the role of a previously unexplored projection from the ventromedial region of PFC (vmPFC) to the lateral entorhinal cortex (LEC) in modulating the gain of behavior in response to contextual information during threat retrieval and encoding. Methods: We used optogenetics followed by in vivo calcium imaging in male C57/B6J mice to manipulate and monitor vmPFC-LEC activity in response to threat-associated cues in different contexts. We then investigated the inputs to, and outputs from, vmPFC-LEC cells using Rabies tracing and channelrhodopsin-assisted electrophysiology. Results: vmPFC-LEC cells flexibly and bidirectionally shaped behavior during threat expression, shaping sensitivity to contextual information to increase or decrease the gain of behavioral output in response to a threatening or neutral context, respectively. Conclusions: Glutamatergic vmPFC-LEC cells are key players in behavioral gain control in response to contextual information during threat processing and may provide a future target for intervention in threat-based disorders.

Rodent-borne viruses in the region of Middle East.

Al-Eitan L, Alnemri M, Alkhawaldeh M, Mihyar A.
16-03-2023
Rev Med Virol.
https://pubmed.ncbi.nlm.nih.gov/36924105/

Descriptive cross-sectional study on major bovine diseases and associated risk factors in north-eastern Ecuadorian Amazon.

Ortiz-Naveda NR, Guamán-Rivera SA, González-Marcillo RL, Guerrero-Pincay AE.
10-03-2023
Braz J Biol.
https://pubmed.ncbi.nlm.nih.gov/36921193/

Pseudotyped Viruses for Lyssavirus.

Wang W, Long C, Wang L, Wang Y.
2023
Adv Exp Med Biol.
https://pubmed.ncbi.nlm.nih.gov/36920698/

Lyssaviruses, which belong to the family Rhabdoviridae, are enveloped and bullet-shaped ssRNA viruses with genetic diversity. All members of Lyssavirus genus are known to infect warm-blooded animals and cause the fatal disease rabies. The rabies virus (RABV) in lyssavirus is the major pathogen to cause fatal rabies. The pseudotyped RABV is constructed to study the biological functions of G protein and evaluation of anti-RABV products including vaccine-induced antisera, rabies immunoglobulins (RIG), neutralizing mAbs, and other antiviral inhibitors. In this chapter, we focus on RABV as a representative and describe the construction of RABV G protein bearing pseudotyped virus and its applications. Other non-RABV lyssaviruses are also included.

Fast-spreading virus could help to slash rabies in vampire bats.

[No authors listed]

14-03-2023
Nature.
https://pubmed.ncbi.nlm.nih.gov/36918643/

Organizational Principles of the Centrifugal Projections to the Olfactory Bulb.

Wang L, Li X, Chen F, Liu Q, Xu F.
26-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36902010/

Centrifugal projections in the olfactory system are critical to both olfactory processing and behavior. The olfactory bulb (OB), the first relay station in odor processing, receives a substantial number of centrifugal inputs from the central brain regions. However, the anatomical organization of these centrifugal connections has not been fully elucidated, especially for the excitatory projection neurons of the OB, the mitral/tufted cells (M/TCs). Using rabies virus-mediated retrograde monosynaptic tracing in Thy1-Cre mice, we identified that the three most prominent inputs of the M/TCs came from the anterior olfactory nucleus (AON), the piriform cortex (PC), and the basal forebrain (BF), similar to the granule cells (GCs), the most abundant population of inhibitory interneurons in the OB. However, M/TCs received proportionally less input from the primary olfactory cortical areas, including the AON and PC, but more input from the BF and contralateral brain regions than GCs. Unlike organizationally distinct inputs from the primary olfactory cortical areas to these two types of OB neurons, inputs from the BF were organized similarly. Furthermore, individual BF cholinergic neurons innervated multiple layers of the OB, forming synapses on both M/TCs and GCs. Taken together, our results indicate that the centrifugal projections to different types of OB neurons may provide complementary and coordinated strategies in olfactory processing and behavior.

Culling vampire bats failed to beat rabies - and made the problem worse.

Coleman J.
10-03-2023
Nature.
https://pubmed.ncbi.nlm.nih.gov/36899187/

Effects of culling vampire bats on the spatial spread and spillover of rabies virus.

Viana M, Benavides JA, Broos A, Ibañez Loayza D, Niño R, Bone J, da Silva Filipe A, Orton R, Valderrama Bazan W, Matthiopoulos J, Streicker DG.
10-03-2023
Sci Adv.
https://pubmed.ncbi.nlm.nih.gov/36897949/

Trachome

Prevalence of Trachoma in Four Evaluation Units in Yemen after Implementation of Trachoma Elimination Measures.

Al-Khateeb T, Al-Haidari S, Butcher R, Rajamani A, Mahdy MAK, Jimenez C, Dejene M, Boyd S, Bakhtiari A, Solomon AW, Thabit A, Harding-Esch EM, Al-Shami R.
13-03-2023
Ophthalmic Epidemiol.
https://pubmed.ncbi.nlm.nih.gov/36908236/

Background: In baseline trachoma prevalence surveys, six districts in two governorates of Yemen were identified as requiring interventions. We set out to estimate the prevalence of trachoma 6-12 months after one round of antibiotic mass drug administration (MDA) and implementation of measures to encourage facial cleanliness. Methods: A population-based prevalence survey was conducted in each of the four evaluation units in October 2019. Contemporary World Health Organization recommendations for trachoma surveys were followed. Participants were selected using a two-stage cluster sampling process. The prevalence of inflammatory and late-stage trachoma was measured through eye examination. Water, sanitation, and hygiene facility access among visited households was estimated. Results: The prevalence of trachomatous inflammation-,follicular (TF) in 1-9-year-olds per EU was <5.0% in three EUs (Al Mighlaf, Al Munirah, and As Salif; Az Zaydiyah; and Mudhaykhirah districts) and 5.0-9.9% in one EU (Far Al Udayn District). The prevalence of TT unknown to the health system in ≥15-year-olds per EU was <0.2% in all four EUs. Per EU, the proportion of households with an improved drinking water source ranged from 40% to 100%; access to an improved drinking water source within 30-minute return journey of the household ranged from 45% to 100%; and with an improved latrine ranged from 32% to 83%. Conclusion: An additional round of antibiotic MDA should be administered in Far Al Udayn district before it is resurveyed. In the other surveyed districts, pre-validation surveillance surveys should be conducted in 2 years' time to determine if the TF prevalence <5% has been maintained.

Knowledge, Attitudes, and Practices of Hygiene and the Prevention of Trachoma in the Indigenous Population of the Colombian Amazon Vaupés Department.

Trujillo-Trujillo J, Meza-Cárdenas M, Sánchez SB, Zamora SM, Porras A, López de Mesa CB, Bernal Parra LM, Bernal Lizarazú MC, Miller H, Silva JC.
06-03-2023
Int J Environ Res Public Health.
https://pubmed.ncbi.nlm.nih.gov/36901643/

Trachoma Prevention Practice and Associated Factors in Rural Lemo District, Southern Ethiopia, 2021.

Shobiso MG, Hussen MS, Munaw MB, Tilahun MM.

Jan-2023
Ethiop J Health Sci.
https://pubmed.ncbi.nlm.nih.gov/36890944/

Ulcère de Buruli

Impact of Temperature and Oxygen Availability on Gene Expression Patterns of Mycobacterium ulcerans.

Dhungel L, Bonner R, Cook M, Henson D, Moulder T, Benbow ME, Jordan H.
13-03-2023
Microbiol Spectr.
https://pubmed.ncbi.nlm.nih.gov/36912651/

Buruli ulcer disease is a neglected tropical disease caused by the environmental pathogen Mycobacterium ulcerans. The M. ulcerans major virulence factor is mycolactone, a lipid cytotoxic compound whose genes are carried on a plasmid. Although an exact reservoir and mode(s) of transmission are unknown, data provide evidence of both. First, Buruli ulcer incidence and M. ulcerans presence have been linked to slow-moving water with low oxygen. M. ulcerans has also been suggested to be sensitive to UV due to termination in *crtI*, encoding a phytoene dehydrogenase, required for carotenoid production. Further, M. ulcerans has been shown to cause disease following puncture but not when introduced to open abrasion sites, suggesting that puncture is necessary for transmission and pathology. Despite these findings, the function and modulation of mycolactone and other genes in response to dynamic abiotic conditions such as UV, temperature, and oxygen have not been shown. In this study, we investigated modulation of mycolactone and other genes on exposure to changing UV and oxygen microenvironmental conditions. Mycolactone expression was downregulated on exposure to the single stress high temperature and did not change significantly with exposure to UV; however, it was upregulated when exposed to microaerophilic conditions. Mycolactone expression was downregulated under combined stresses of high temperature and low oxygen, but there was upregulation of several stress response genes. Taken together, results suggest that temperature shapes M. ulcerans metabolic response more so than UV exposure or oxygen requirements. These data help to define the environmental niche of M. ulcerans and metabolic responses during initial human infection. IMPORTANCE Buruli ulcer is a debilitating skin disease caused by the environmental pathogen Mycobacterium ulcerans. M. ulcerans produces a toxic compound, mycolactone, which leads to tissue necrosis and ulceration. Barriers to preventing Buruli ulcer include an incomplete understanding of M. ulcerans reservoirs, how the pathogen is transmitted, and under what circumstances mycolactone and other M. ulcerans genes are expressed and produced in its natural environment and in the host. We conducted a study to investigate M. ulcerans gene expression under several individual or combined abiotic conditions. Our data showed that mycolactone expression was downregulated under combined stresses of high temperature and low oxygen but there was upregulation of several stress response genes. These data are among only a few studies measuring modulation of mycolactone and other M. ulcerans genes that could be involved in pathogen fitness in its natural environment and virulence while within the host.

DihydrofolateReductase (DHFR) Inhibitors: A Comprehensive Review.

Sehrawat R, Rathee P, Khatkar S, Akkol E, Khayatkashani M, Nabavi SM, Khatkar A.
10-03-2023
Curr Med Chem.
https://pubmed.ncbi.nlm.nih.gov/36896902/

Background: Dihydrofolate reductase (DHFR) is an indispensable enzyme required for the survival of most prokaryotic and eukaryotic cells as it is involved in the biosynthesis of essential cellular components. DHFR has attracted a lot of attention as a molecular target for various diseases like cancer, bacterial infection, malaria, tuberculosis, dental caries, trypanosomiasis, leishmaniasis, fungal infection, influenza, Buruli ulcer, and respiratory illness. Various teams of researchers have reported different DHFR inhibitors to explore their therapeutic efficacy. Despite all the progress made, there is a strong need to find more novel leading structures, which may be used as better and safe DHFR inhibitors, especially against the microorganisms which are resistant to the developed drug candidates. Objective: This review aims to pay attention to recent development, particularly made in the past two decades and published in this field, and pay particular attention to promising DHFR inhibitors. Hence, an attempt has been made in this article to highlight the structure of dihydrofolate reductase, the mechanism of action of DHFR inhibitors, most recently reported DHFR inhibitors, diverse pharmacological applications of DHFR inhibitors, reported in-silico study data and recent patents based on DHFR inhibitors to comprehensively portray the current scenery for researchers interested in designing novel DHFR inhibitors. Conclusion: A critical review of recent studies revealed that most novel DHFR inhibitor compounds either synthetically or naturally derived are characterized by the presence of heterocyclic moieties in their structure. Non-classical antifolates like trimethoprim, pyrimethamine, and proguanil are considered excellent templates to design novel DHFR inhibitors, and most of them have substituted 2,4-diamino pyrimidine motifs. Targeting DHFR has massive potential to be investigated for newer therapeutic possibilities to treat various diseases of clinical importance.

Lèpre

[Snakes as a source of drugs from the Han to the Song Dynasties].

Liu YZ, Wang YL.
28-01-2023
Zhonghua Yi Shi Za Zhi.
https://pubmed.ncbi.nlm.nih.gov/36925147/

This paper examined the history of snakes as a source of drugs from the Han to the Song Dynasties. Snake products, for medicinal purposes, were not widely used in the Han, Wei and Jin Dynasties out of worship and fear of snakes.The source of snake products taken for medical purposes might be partly because local people ate snakes in the South area. Palace snakes and pit viper products were taken as drugs in the Tang Dynasty for the treatment of leprosy and ulcers of the female external genitals. Zaocysdhumnades were seldom used as medicine because they were not recorded in medical documents in the Tang Dynasty, but only seen in some notes. They were widely used in medical practice in the late Tang and the early Song Dynasties and were formally recorded in medical documents for the diseases caused by Wind. Their effectiveness, rarity, high value and toxicity contraindication were repeatedly stressed while palace snakes and pit vipers were seldom mentioned and used.

Development of treatment-decision algorithms for children evaluated for pulmonary tuberculosis: an individual participant data meta-analysis.

Gunasekera KS, Marcy O, Muñoz J, Lopez-Varela E, Sekadde MP, Franke MF, Bonnet M, Ahmed S, Amanullah F, Anwar A, Augusto O, Aurilio RB, Banu S, Batool I, Brands A, Cain KP, Carratalá-Castro L, Caws M, Click ES, Cranmer LM, García-Basteiro AL, Hesseling AC, Huynh J, Kabir S, Lecca L, Mandalakas A, Mavhunga F, Myint AA, Myo K, Nampijja D, Nicol MP, Orikiriza P, Palmer M, Sant'Anna CC, Siddiqui SA, Smith JP, Song R, Thuong Thuong NT, Ung V, van der Zalm MM, Verkuijl S, Viney K, Walters EG, Warren JL, Zar HJ, Marais BJ, Graham SM, Debray TPA, Cohen T, Seddon JA.
13-03-2023
Lancet Child Adolesc Health.
https://pubmed.ncbi.nlm.nih.gov/36924781/

Background: Many children with pulmonary tuberculosis remain undiagnosed and untreated with related high morbidity and mortality. Recent advances in childhood tuberculosis algorithm development have incorporated prediction modelling, but studies so far have been small and localised, with limited generalisability. We aimed to evaluate the performance of currently used diagnostic algorithms and to use prediction modelling to develop evidence-based algorithms to assist in tuberculosis treatment decision making for children presenting to primary health-care centres. Methods: For this meta-analysis, we identified individual participant data from a WHO public call for data on the management of tuberculosis in children and adolescents and referral from childhood tuberculosis experts. We included studies that prospectively recruited consecutive participants younger than 10 years attending health-care centres in countries with a high tuberculosis incidence for clinical evaluation of pulmonary tuberculosis. We collated individual participant data including clinical, bacteriological, and radiological information and a standardised reference classification of pulmonary tuberculosis. Using this dataset, we first retrospectively evaluated the performance of several existing treatment-decision algorithms. We then used the data to develop two multivariable prediction models that included features used in clinical evaluation of pulmonary tuberculosis-one with chest x-ray features and one without-and we investigated each model's generalisability using internal-external cross-validation. The parameter coefficient estimates of the two models were scaled into two scoring systems to classify tuberculosis with a prespecified sensitivity target. The two scoring systems were used to develop two pragmatic, treatment-decision algorithms for use in primary health-care settings. Findings: Of 4718 children from 13 studies from 12 countries, 1811 (38·4%) were classified as having pulmonary tuberculosis: 541 (29·9%) bacteriologically confirmed and 1270 (70·1%) unconfirmed. Existing treatment-decision algorithms had highly variable diagnostic performance. The scoring system derived from the prediction model that included clinical features and features from chest x-ray had a combined sensitivity of 0·86 [95% CI 0·68-0·94] and specificity of 0·37 [0·15-0·66] against a composite reference standard. The scoring system derived from the model that included only clinical features had a combined sensitivity of 0·84 [95% CI 0·66-0·93] and specificity of 0·30 [0·13-0·56] against a composite reference standard. The scoring system from each model was placed after triage steps, including assessment of illness acuity and risk of poor tuberculosis-related outcomes, to develop treatment-decision algorithms. Interpretation: We adopted an evidence-based approach to develop pragmatic algorithms to guide tuberculosis treatment decisions in children, irrespective of the resources locally available. This approach will empower health workers in primary health-care settings with high tuberculosis incidence and limited resources to initiate tuberculosis treatment in children to improve access to care and reduce tuberculosis-related mortality. These algorithms have been included in the operational handbook accompanying the latest WHO guidelines on the management of tuberculosis in children and adolescents. Future prospective evaluation of algorithms, including those developed in this work, is necessary to investigate clinical performance. Funding: WHO, US National Institutes of Health.

Where are the missing people affected by tuberculosis? A programme review of patient-pathway and cascade of care to optimise tuberculosis case-finding, treatment and prevention in Cambodia.

Teo AKJ, Morishita F, Prem K, Eng S, An Y, Huot CY, Khun KE, Tieng S, Deng S, Tuot S, Yi S.
Mar-2023
BMJ Glob Health.
https://pubmed.ncbi.nlm.nih.gov/36921989/

Background: Cambodia has achieved great success in tuberculosis (TB) control in the past decade. Nevertheless, people with TB are missed by the health systems at different stages of the care pathway. This programme review corroborated the care-seeking behaviours of people with TB and TB services availability and estimated the number of people completing each step of the TB disease and TB preventive treatment (TPT) care cascade. Methods: Patient pathways and the care cascades for TB disease and TPT were constructed using data from the

latest national TB prevalence survey, routine surveillance and programme, the global TB database and published studies. We also randomly selected TB survivors in the 2019 cohort to assess recurrence-free survival 1-year post-treatment. TPT care cascade was constructed for people living with HIV (PLHIV) and household contacts (children <5 years and all ages) of persons with bacteriologically-confirmed TB in 2019 and 2020. **Results:** Nationally, 54% of those who exhibited TB symptoms sought initial care in the private sector. Overall, 93% and 58% of people with presumptive TB did not access a facility with TB diagnostic and treatment services, respectively, at the first point of care-seeking. Approximately 56% (95% CI 52% to 57%) of the 47 000 (95% CI 31 000 to 68 000) estimated TB cases in 2019 achieved recurrence-free survival. Among the estimated PLHIV in Cambodia, <30% completed TPT. Among children <5 years, 53% (95% CI 29% to 65%) (2019) and 67% (95% CI 36% to 80%) (2020) of those eligible for TPT completed the regimen successfully. In 2019 and 2020, 23% (95% CI 22% to 25%) and 54% (95% CI 50% to 58%) of the estimated household contacts (all ages) eligible for TPT completed the regimen successfully. **Conclusion:** There are significant gaps in care-seeking, coverage and access to TB services and TPT in Cambodia. Action plans to improve TB response have been co-developed with local stakeholders to address the gaps throughout the care cascades.

A rare case of cutaneous leishmaniasis in Kathmandu presenting with features of bacterial skin infection: A case report.

Regmi A, Adhikari B, Karki P, Baral S, Adhikari IR.
11-03-2023
Clin Case Rep.
https://pubmed.ncbi.nlm.nih.gov/36919149/

Effectiveness of digital adherence technologies in improving tuberculosis treatment outcomes in four countries: a pragmatic cluster randomised trial protocol.

Jerene D, Levy J, van Kalmthout K, Rest JV, McQuaid CF, Quaife M, Charalambous S, Gamazina K, Garfin AMC, Mleoh L, Terleieva Y, Bogdanov A, Maraba N, Fielding K.
14-03-2023
BMJ Glob Health.
https://pubmed.ncbi.nlm.nih.gov/36918242/

Introduction: Successful treatment of tuberculosis depends to a large extent on good adherence to treatment regimens, which relies on directly observed treatment (DOT). This in turn requires frequent visits to health facilities. High costs to patients, stigma and burden to the health system challenged the DOT approach. Digital adherence technologies (DATs) have emerged as possibly more feasible alternatives to DOT but there is conflicting evidence on their effectiveness and feasibility. Our primary objective is to evaluate whether the implementation of DATs with daily monitoring and a differentiated response to patient adherence would reduce poor treatment outcomes compared with the standard of care (SOC). Our secondary objectives include: to evaluate the proportion of patients lost to follow-up; to compare effectiveness by DAT type; to evaluate the feasibility and acceptability of DATs; to describe factors affecting the longitudinal engagement of patients with the intervention and to use a simple model to estimate the epidemiological impact and cost-effectiveness of the intervention from a health system perspective. **Methods and analysis:** This is a pragmatic two-arm cluster-randomised trial in the Philippines, South Africa, Tanzania and Ukraine, with health facilities as the unit of randomisation. Facilities will first be randomised to either the DAT or SOC arm, and then the DAT arm will be further randomised into medication sleeve/labels or smart pill box in a 1:1:2 ratio for the smart pill box, medication sleeve/label or the SOC respectively. We will use data from the digital adherence platform and routine health facility records for analysis. In the main analysis, we will employ an intention-to-treat approach to evaluate treatment outcomes. **Ethics and dissemination:** The study has been approved by the WHO Research Ethics Review Committee (0003296), and by country-specific committees. The results will be shared at national and international meetings and will be published in peer-reviewed journals.

Lessons From the Wrong Isolation Policy Violating Human Rights for Leprosy in Japan.

Horikoshi Y, Toizumi M.
02-03-2023
Pediatr Infect Dis J.
https://pubmed.ncbi.nlm.nih.gov/36916867/

Heck's Disease.

Thangaraj R, Misra S.
15-03-2023
Indian Pediatr.
https://pubmed.ncbi.nlm.nih.gov/36916368/

Diagnosis of Human Cutaneous Leishmaniasis: A Comparative Study Using CL Detect™ Dipstick, Direct Smear and Polymerase Chain Reaction Methods.

Zamanpour M, Mohebali M, Khamesipour A, Mohammadi AMA, Akhoundi B.
13-03-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36913075/

Tolerability and efficacy assessment of an oral collagen supplement for the improvement of biophysical and ultrasonographic parameters of skin in middle eastern consumers.

Samadi A, Movaffaghi M, Kazemi F, Yazdanparast T, Ahmad Nasrollahi S, Firooz A.
13-03-2023
J Cosmet Dermatol.
https://pubmed.ncbi.nlm.nih.gov/36912494/

Genomic signatures of protease and reverse transcriptase genes from HIV-1 subtype C isolated from first-line ART patients in India.

Barik SK, Mohanty KK, Patil SA, Tripathy SP, Singh D, Hanna LE, Karunaianantham R, Pattabiraman S, Singh TP, Tandon R, Jena S.
30-04-2022
Bioinformation.
https://pubmed.ncbi.nlm.nih.gov/36909690/

Genomic signatures of the protease and reverse transcriptase gene of HIV-1 from HIV infected North Indian patients who were under ART from 1 to ≤ 7 years were analyzed. The DNA from plasma samples of 9 patients and RNA from 57 patients were isolated and subjected to amplification for the protease and reverse transcriptase gene of HIV-1 subtype C. Then sequencing was carried out following the WHO dried blood spot protocol. The drug resistance mutation patterns were analyzed using the HIV Drug Resistance Database, Stanford University, USA. Lamivudine-associated drug-resistance mutations such as M184V/M184I, nevirapine-associated drug resistance mutations Y181C and H221Y, and efavirenz-associated drug resistance mutations M230I were observed in reverse transcriptase gene of archived DNA of two HIV-1 infected patients. No mutation was observed in the remaining 7 patients. Various computational tools and websites like viral epidemiological signature pattern analysis (VESPA), hyper mutation, SNAP version 2.1.1, and entropy were utilized for the analysis of the signature pattern of amino acids, hyper mutation, selection pressure, and Shannon entropy in the protease and reverse transcriptase gene sequences of the 9 archived DNA, 56 protease gene and 51 reverse transcriptase gene from the HIV-1 DNA amplified sequences of RNA. The HIV-1 Subtype-C (Gene bank accession number: AB023804) and first isolate HXB2 (Gene bank accession number: K03455.1) was taken as reference sequence. The signature amino acid sequences were identified in the protease and reverse transcriptase gene, no hyper mutation, highest entropy was marked in the amino acid positions and synonymous to non-synonymous nucleotide ratio was calculated in the protease and reverse transcriptase gene of 9 archived DNA sequences, 56 protease and 51 reverse transcriptase gene sequences of HIV-1 Subtype C isolates.

The Italian lazarets of the Adriatic Sea: from their institution to the fight against the economic and demographic collapse caused by epidemics.

Vicentini CB, Simonetti O, Martini M, Contini C.
01-03-2023
Infez Med.
https://pubmed.ncbi.nlm.nih.gov/36908396/

Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches.

Mukerjee N, Chaudhari SY, Jha S, Sinha S, Jadhav SB, Dhar R, Rathod VD, Nanaware RB, Chakole RD, Sharma D, Sharma PP, Pawar SD, Ghosh A.
02-03-2023
Int J Surg.
https://pubmed.ncbi.nlm.nih.gov/36906766/

Macrophage Biology in Human Granulomatous Skin Inflammation.

Klapproth H, Huerta Arana M, Fabri M.
07-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36902053/

Evidence for Extensive Duplication and Subfunctionalization of FCRL6 in Armadillo (Dasypus novemcinctus).

Matos MC, Pinheiro A, Davis RS, Esteves PJ.
25-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36901962/

The control of infections by the vertebrate adaptive immune system requires careful modulation to optimize defense and minimize harm to the host. The Fc receptor-like (*FCRL*) genes encode immunoregulatory molecules homologous to the receptors for the Fc portion of immunoglobulin (FCR). To date, nine different genes (*FCRL1-6*, *FCRLA*, *FCRLB* and *FCRLS*) have been identified in mammalian organisms. *FCRL6* is located at a separate chromosomal position from the *FCRL1-5* locus, has conserved synteny in mammals and is situated between the *SLAMF8* and *DUSP23* genes. Here, we show that this three gene block underwent repeated duplication in *Dasypus novemcinctus* (nine-banded armadillo) resulting in six *FCRL6* copies, of which five appear functional. Among 21 mammalian genomes analyzed, this expansion was unique to *D. novemcinctus*. Ig-like domains that derive from the five clustered *FCRL6* functional gene copies show high structural conservation and sequence identity. However, the presence of multiple non-synonymous amino acid changes that would diversify individual receptor function has led to the hypothesis that *FCRL6* endured subfunctionalization during evolution in *D. novemcinctus*. Interestingly, *D. novemcinctus* is noteworthy for its natural resistance to the *Mycobacterium leprae* pathogen that causes leprosy. Because *FCRL6* is chiefly expressed by cytotoxic T and NK cells, which are important in cellular defense responses against *M. leprae*, we speculate that *FCRL6* subfunctionalization could be relevant for the adaptation of *D. novemcinctus* to leprosy. These findings highlight the species-specific diversification of *FCRL* family members and the genetic complexity underlying evolving multigene families critical for modulating adaptive immune protection.

They do not have symptoms - why do they need to take medicines? Challenges in tuberculosis preventive treatment among children in Cambodia: a qualitative study.

An Y, Teo AKJ, Huot CY, Tieng S, Khun KE, Pheng SH, Leng C, Deng S, Song N, Nonaka D, Yi S.
10-03-2023

BMC Pulm Med.
https://pubmed.ncbi.nlm.nih.gov/36899328/

Background: Latent tuberculosis (TB) infection has been known as a seedbed for TB disease later in life. The interruption from latent TB infection to TB disease can be done through TB preventive treatment (TPT). In Cambodia, only 40.0% of children under five years old who were the household contacts to bacteriologically confirmed TB cases were initiated with TPT in 2021. Scientific studies of context-specific operational challenges in TPT provision and uptake among children are scarce, particularly in high TB-burden countries. This study identified challenges in TPT provision and uptake among children in Cambodia from the perspective of healthcare providers and caregivers. **Methods:** Between October and December 2020, we conducted in-depth interviews with four operational district TB supervisors, four clinicians and four nurses in charge of TB in referral hospitals, four nurses in charge of TB in health centers, and 28 caregivers with children currently or previously on TB treatment or TPT, and those who refused TPT for their eligible children. Data were audio recorded along with field notetaking. After verbatim transcription, data analyses were performed using a thematic approach. **Results:** The mean age of healthcare providers and caregivers were 40.19 years (SD 12.0) and 47.9 years (SD 14.6), respectively. Most healthcare providers (93.8%) were male, and 75.0% of caregivers were female. More than one-fourth of caregivers were grandparents, and 25.0% had no formal education. Identified key barriers to TPT implementation among children included TPT side effects, poor adherence to TPT, poor understanding of TPT among caregivers, TPT risk perception among caregivers, TPT's child-unfriendly formula, TPT supply-chain issues, caregivers' concern about the effectiveness of TPT, being non-parental caregivers, and poor community engagement. **Conclusion:** Findings from this study suggest that the national TB program should provide more TPT training to healthcare providers and strengthen supply chain mechanisms to ensure adequate TPT drug supplies. Improving community awareness of TPT among caregivers should also be intensified. These context-specific interventions will play a crucial role in expanding the TPT program to interrupt the development from latent TB infection to active and ultimately lead to ending TB in the country.

Lepromatous nodular syphilis: A case from Italy.

Pipitò L, Trizzino M, Orlando E, Calà C, Cascio A.
09-03-2023
Travel Med Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36898489/

Advancing proficiency testing for ultra in resource-limited settings using dried tube specimen: A study by SRL-Uganda.

Kabugo J, Namutebi J, Adam I, Mujuni D, Tugumisirize D, Denis O, Kasule GW, Ibanda I, Orena B, Byabajungu H, Nampewo E, Joloba M.
10-03-2023
PLoS One.
https://pubmed.ncbi.nlm.nih.gov/36897841/

Background: Proficiency testing (PT) has been hard to set up due to cost limitations and technical capacity. Conventional Xpert MTB/RIF PT programs use liquid and culture spots which require stringent storage and transportation conditions with cross-contamination chances prevalent. These setbacks prompted the use of dried tube specimens (DTS) for Ultra assay PT. For continuity of PT provision, stability of DTS and compatibility with testing protocols when kept for a long period needs to be established. **Methods:** DTS were prepared from known isolates inactivated using a hot air oven at 85°C. 100µl of bacterial suspensions were aliquoted and dried inside a Biosafety cabinet. Panel validation was done to establish the baseline Deoxyribonucleic acid (DNA) concentration in terms of cycle threshold (Ct) value. DTS aliquots were shipped to participants to test and report within six weeks. The remaining DTS were kept at 2-8°C and room temperature for one year with testing at six months. Twenty (20) DTS samples per set remaining at one year were heated at 55°C for two weeks before testing. The means of the different samples were compared to validation data using paired t-tests. Boxplots were designed to visualize the differences in the medians of the DTS. **Results:** Overall mean Ct value increased by 4.4 from the validation to testing after one year at the different storage conditions. Samples heated at 55°C showed a 6.4 Ct difference from validation data. Testing done at six months on 2-8°C stored items showed no statistical difference. At all the remaining testing times and conditions, P-values were less than 0.008 although the absolute mean Ct when compared showed slight increments and accommodated differences for the detection of MTB and rifampicin resistance. Median values for samples stored at 2-8°C were lower compared to those at room temperature. **Conclusion:** DTS stored at 2-8°C remain more stable for one year compared to higher temperatures and can be consistently used as PT materials in more than one PT round for biannual PT providers.

Viral co-infections in leprosy: a scoping review.

Fróes LAR Jr, Toma TS, Poderoso RE, Trindade MÂB.
Apr-2023
Int J Dermatol.
https://pubmed.ncbi.nlm.nih.gov/36738114/

Neonatal umbilical myiasis: a tropical malady.

Senapathi SC, Garg AK, Kishore K, Patnaik SK, Kondaparthy N, Amaresh P.
Apr-2023
Int J Dermatol.
https://pubmed.ncbi.nlm.nih.gov/36512723/

Leprosy Reactions: Clinical Pharmacologist Perspective with Repurposed Medications.

Thangaraju P, Balan AK, Velmurugan H, Venkatesan S, Yella SST.
2023

Infect Disord Drug Targets.
https://pubmed.ncbi.nlm.nih.gov/36082854/

The elimination of leprosy has been possible with the available anti-leprotic drugs. However, the lepra reactions usually occur months or years after multi-drug therapy completion, and continue to be a formidable challenge mainly owing to its role in causing nerve damage and disability. Corticosteroids are commonly used but they lead to systemic complications, and hence require dose reduction and adjunct therapy with a different target. Various drugs with different targets have been identified and are in practice to treat lepra reactions. The newer targets can include genetic and tissue targets in the skin and nerve. Thalidomide treatment reducing pentraxin-3, toll-like receptor antagonists, minocycline, apremilast, immunomodulators, and tenidap can be helpful in lepra reaction. Other modalities to manage lepra reactions include plasma exchange, intravenous immunoglobulins, and immunotherapy. Most of these treatments are based only on the pathological process of the reaction and tend to be incomplete leading to recurrence. Newer multimodal approaches are required based on various biomarkers (genetic, tissue, serological), which can be monitored to prevent the recurrence of reactions. Hence, there is a need for newer targets and drugs to be identified for the management of lepra reactions.

Early culture conversion is a poor marker of treatment outcome among people with HIV and drug-resistant TB.

Baluku JB, Nabwana M, Mwanahamisi SB, Kansiime G, Nuwagira E, Turyahabwe S, Kirenga B.
Mar-2023
HIV Med.
https://pubmed.ncbi.nlm.nih.gov/36054688/

Objective: Our objective was to determine associations between early (≤2 months) culture conversion (ECC) among people with HIV and drug-resistant tuberculosis (DRTB) in Uganda. Methods: This was a countrywide retrospective cohort of people with bacteriologically confirmed DRTB and a positive baseline culture at 16 centres in Uganda between 2013 and 2019. Data were abstracted from treatment files and unit DRTB registers. Monthly sputum cultures were performed using the Lowenstein-Jensen solid medium. Results: We included 664 people with DRTB and a positive baseline culture, of whom 353 (53.4%) also had HIV. Among those living with HIV, 225 (63.7%) were male and 331 (94.3%) were on antiretroviral therapy. The median month of culture conversion was 2 (interquartile range [IQR] 1-3). ECC was observed among 226 people living with HIV (64.0%; 95% confidence interval [CI] 58.9-68.9). A DRTB treatment regimen of six or more drugs was associated with ECC among people living with HIV (adjusted odds ratio [aOR] 3.82; 95% CI 1.06-13.82; p = 0.041). Cure and overall treatment success was observed among 232 (65.7%) and 269 (76.2%) people living with HIV, respectively. However, ECC was not associated with cure (crude odds ratio [OR] 0.97; 95% CI 0.61-1.54; p = 0.901), death (OR 1.12; 95% CI 0.61-2.29; p = 0.610), or overall treatment success (OR 1.29; 95% CI 0.78-2.13; p = 0.326). Conclusion: The majority of people living with HIV and DRTB achieve ECC. However, ECC does not predict cure, death, or treatment success. Moreover, it may require six or more drugs to achieve ECC. ECC is not an excellent indicator of the effectiveness of DRTB regimens among people living with HIV.

An Overview of Treatment Guidelines and Methods of Synthesis of Drugs Used in Leprosy Chemotherapy.

Pinheiro LCS, Borges JC, Campos VR, Dantas LC.
2023
Mini Rev Med Chem.
https://pubmed.ncbi.nlm.nih.gov/35430972/

Trypanosomes (trypanosomiase et maladie de Chagas)

TrypTag.org: from images to discoveries using genome-wide protein localisation in Trypanosoma brucei.

Sunter JD, Dean S, Wheeler RJ.
14-03-2023
Trends Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36925446/

TrypTag was a 4-year project to tag the N- and C-termini of almost all Trypanosoma brucei proteins with a fluorescent protein and record the subcellular localisation through images and manual annotation. We highlight the new routes to cell biological discovery this transformative resource is enabling for parasitologists and cell biologists.

Trypanosoma cruzi DTU II coinfection with bacteria producing prolonged cutaneous lesion in a healthy young male.

Rangel-Gamboa L, González-Martínez EI, Sánchez-Cruz LC, Montiel-Rangel AI, Martínez-Hernández F.
13-03-2023
Rev Inst Med Trop Sao Paulo.
https://pubmed.ncbi.nlm.nih.gov/36921203/

Recent Advances in the Discovery of Antiparasitic Drugs for Chagas Disease and Malaria.

de Moraes J.
2023
Curr Top Med Chem.
https://pubmed.ncbi.nlm.nih.gov/36919344/

Identification of a triatomine infected with Trypanosoma cruzi in an urban area of the state of Veracruz, Mexico: A comprehensive study.

Paulina OM, Aracely LM, Jaime LD, Jesús TM, Alberto DJ, Angel RL.
13-03-2023

Zoonoses Public Health.
https://pubmed.ncbi.nlm.nih.gov/36915955/

Case Report: A Case of Post-Transplant Chagas Reactivation after Negative Trypanosoma cruzi Testing.

Shakhtour O, Aberra T, Ahmad H, Saxena A, Isaac I, Meda N, Gadodia R, Marcus R.
13-03-2023
Am J Trop Med Hyg.
https://pubmed.ncbi.nlm.nih.gov/36913926/

Patients with Chagas cardiomyopathy carry a significant risk of reactivation after heart transplantation. Reactivation of Chagas disease can lead to graft failure or systemic complications such as fulminant central nervous system disease and sepsis. As such, careful screening for Chagas seropositivity prior to transplant is crucial to preventing negative outcomes in the post-transplant setting. One challenge in screening these patients is the variety of laboratory tests available and their differing sensitivities and specificities. In this case report, we present a patient who tested positive by a commercial Trypanosoma cruzi antibody assay and later tested negative by CDC confirmatory serological analysis. After the patient underwent orthotopic heart transplant, he underwent protocol-based polymerase chain reaction surveillance for reactivation as a result of persistent concerns for T. cruzi infection. It was discovered shortly thereafter that the patient had reactivation of Chagas disease, confirming that he did have Chagas cardiomyopathy prior to transplantation, despite negative confirmatory testing. This case illustrates the complexities of serological diagnosis of Chagas disease and the importance of additional testing for T. cruzi when the post-test probability remains high even with a commercial, negative serologic test.

Coenzyme Q_{10} prevented Trypanosoma brucei rhodesiense-mediated breach of the blood brain barrier, inflammation and organ damage in late stage of Human African Trypanosomiasis.

Kitwan L, Makobe C, Mdachi R, Maranga DN, Isaac AO, Nyariki JN.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910316/

Synthesis, characterization, antioxidant and antiparasitic activities new naphthyl-thiazole derivatives.

Santos NFN, Junior NDSB, de Oliveira JF, Duarte DMFA, Dos Santos Soares JC, Clara Marques DS, da Silva Santos AC, Nogueira F, Alves Pereira VR, Alves de Lima MC, da Cruz Filho IJ.
11-03-2023
Exp Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36907541/

In this work, 13 thiosemicarbazones (1a - m) and 16 thiazoles (2a - p) were obtained, which were properly characterized by spectroscopic and spectrometric techniques. The pharmacokinetic properties obtained in silico revealed that the derivatives are in accordance with the parameters established by lipinski and veber, showing that such compounds have good bioavailability or permeability when administered orally. In assays of antioxidant activity, thiosemicarbazones showed moderate to high antioxidant potential when compared to thiazoles. In addition, they were able to interact with albumin and DNA. Screening assays to assess the toxicity of compounds to mammalian cells revealed that thiosemicarbazones were less toxic when compared to thiazoles. In relation to in vitro antiparasitic activity, thiosemicarbazones and thiazoles showed cytotoxic potential against the parasites Leishmania amazonensis and Trypanosoma cruzi. Among the compounds, 1b, 1j and 2l stood out, showing inhibition potential for the amastigote forms of the two parasites. As for the in vitro antimalarial activity, thiosemicarbazones did not inhibit Plasmodium falciparum growth. In contrast, thiazoles promoted growth inhibition. This study shows in a preliminary way that the synthesized compounds have antiparasitic potential in vitro.

Host Cell Rap1b mediates cAMP-dependent invasion by Trypanosoma cruzi.

Ferri G, Musikant D, Edreira MM.
10-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36897926/

Leishmaniose

Kala-Azar: A Case Report.

Jancar N, Sousa Gonçalves F, Duro J, Pinto I, Oliveira T, Aguiar P.
11-02-2023
Cureus.
https://pubmed.ncbi.nlm.nih.gov/36923201/

Leishmaniasis is a zoonosis caused by unicellular protozoans *Leishmania*. The transmission can be zoonotic or anthroponotic, depending on the species, and the main vector is the phlebotomine sandfly. The disease is endemic in the tropics of Asia and Africa but is considered rare in Portugal, especially in immunocompetent hosts. Its main clinical syndromes constitute cutaneous leishmaniasis, mucocutaneous disease, and visceral leishmaniasis. The latter is also known as *kala-azar* and is caused by the infection of the phagocytes of the reticuloendothelial system, causing the typical symptoms: fever, hepatosplenomegaly, and pancytopenia. The clinical manifestations are non-specific, frequently causing a delay in the diagnosis, especially in nonendemic areas and immunocompetent hosts. Early diagnosis and treatment are essential, given the high mortality rate in untreated patients. The diagnosis is based on the direct visualization of the protozoan and molecular methods, such as polymerase chain reaction tests. Amphotericin B is considered the first-line treatment. We present a case of

visceral leishmaniasis in an immunocompetent patient with fever, hepatosplenomegaly, and pancytopenia.

Fourth case of tegumentary leishmaniasis in Brazil by Leishmania major – is it possible for new species to be introduced in Brazil through immigration?

Matsumoto CT, Enokihara MMSES, Ogawa MM, Yarak S.
13-03-2023
An Bras Dermatol.
https://pubmed.ncbi.nlm.nih.gov/36922335/

A rare case of cutaneous leishmaniasis in Kathmandu presenting with features of bacterial skin infection: A case report.

Regmi A, Adhikari B, Karki P, Baral S, Adhikari IR.
11-03-2023
Clin Case Rep.
https://pubmed.ncbi.nlm.nih.gov/36919149/

Leishmaniasis is an infectious disease caused by different species of genus Leishmania and transmitted by sandflies. Lesions of CL are most commonly present in the exposed areas, and the most familiar morphological type is papulo-nodular. The diagnosis of CL should be considered while dealing with common skin lesions, as well as encountering uncommon pathologies. We present a case of a 26-year-old man living in Kathmandu originally from Humla whose clinical course was complicated by unsuccessful treatment with suspicion of bacterial skin infection. The patient first presented with an erythematous papule with some scale and crust with central ulceration over the left side of his upper lip and mild fever. With the suspicion of bacterial infection, he was initially treated with antibiotics, which showed no improvement prompting the referral to a tertiary center with further diagnostic workup. Punch biopsy confirmed the presence of amastigote form of leishmaniasis Donovan bodies. Also, the rk39 antibody test was positive. Clinicians need to pay more effort to the diagnosis of CL and include it in the differential diagnoses of patients presenting with typical lesions even if the region is not known to be endemic for CL or in the patient with no known history of insect bite.

Evaluation of a diagnostic device, CL Detect rapid test for the diagnosis of new world cutaneous leishmaniasis in Peru.

Grogl M, Joya CA, Saenz M, Quispe A, Rosales LA, Santos RDP, De Los Santos MB, Donovan N, Ransom JH, Ramos A, Llanos Cuentas E.
13-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36913433/

Diagnosis of Human Cutaneous Leishmaniasis: A Comparative Study Using CL Detect™ Dipstick, Direct Smear and Polymerase Chain Reaction Methods.

Zamanpour M, Mohebali M, Khamesipour A, Mohammadi AMA, Akhoundi B.
13-03-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36913075/

Introduction: In most of the endemic areas, the detection of CL is based on searching for amastigotes using the direct smear method. Since expert microscopists are not usually available in every laboratory, false diagnoses are a disaster that happens. Therefore, the aim of current research is to evaluate the validity of the CL Detect™ Rapid Test (CDRT) for diagnosis CL in comparison to direct smear and polymerase chain reaction (PCR) methods. Methods: A total of 70 patients with skin lesions suspected to be CL were recruited. Skin samples from the lesions were collected and used for direct microscopic examination and the PCR method. Furthermore, the skin sample was collected in accordance with the manufacturer's instructions for the CDRT-based rapid diagnostic test. Results: Of 70 samples, 51 and 35 samples were positive by direct smear examination and the CDRT, respectively. The PCR showed positive results in 59 samples; 50 and 9 samples were identified as Leishmania major and Leishmania tropica, respectively. The sensitivity and specificity were calculated to be 68.6% (95% CI 54.11-80.89%) and 100% (95% CI 82.35-100%). When the results of CDRT were compared to the microscopic examinations, an agreement of 77.14% was seen between the CDRT and microscopic examination. In addition, the sensitivity and specificity were 59.32% (95% CI 45.75-71.93%) and 100% (95% CI 71.5-100%) when the CDRT was compared to PCR assay (as gold standard) and an agreement (65.71%) was found between CDRT and PCR assay. Conclusion: As the CDRT is simple, rapid, and does not require great proficiency, it is recommended for use in the detection of CL caused by L. major or L. tropica as a diagnostic method, especially in areas with limited access to expert microscopists.

Leishmaniasis prevalence, awareness and control in Saudi Arabia.

Kumosani TA, Al-Bogami TJ, Barbour EK, Alshehri SH, Yaghmoor SS, Alshareef NA, El-Say KM, Moselhy SS.
Sep-2022
Afr Health Sci.
https://pubmed.ncbi.nlm.nih.gov/36910416/

Background: *Leishmaniasis* is a widespread skin protozoan infectious disease. It is an intracellular parasitic microorganism that develops in the body of infected female phlebotomine sandflies vector, prior to its transmission to human or animal host by the vector bite. The objective of this review is to highlight the current prevalence of *Leishmaniasis* in the Kingdom of Saudi Arabia, and the direction in research for its control. Materials: The update literature covered The infection of the host with this trypanosome starts with a skin bite from the infected sand fly, followed by penetration of the parasite into cellular structures of the skin, or its infiltration to the circulatory system, targeting the internal organs. Different research groups are experimenting on construction of recombinant *Leishmania* antigens, compiled from this protozoa and from antigens recovered

from the saliva of sand flies, in an attempt to immunize the host for protection against this disease. Conclusion: The benefits behind such a review is to support the personnel involved in developing evidence-based policy guidelines, strategies and standards for disease prevention and management of their implementation; in addition, it provided a technical support to member states to collaborate on establishment of an effective systems to handle the *Leishmaniasis*.

Investigation of antileishmanial activities of CaO nanoparticles on L. tropica and L. infantum parasites, in vitro.

Dalir Ghaffari A, Barati M, Ghaffarifar F, Pirestani M, Ebrahimi M, KarimiPourSaryazdi A.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910320/

Synthesis, characterization, antioxidant and antiparasitic activities new naphthyl-thiazole derivatives.

Santos NFN, Junior NDSB, de Oliveira JF, Duarte DMFA, Dos Santos Soares JC, Clara Marques DS, da Silva Santos AC, Nogueira F, Alves Pereira VR, Alves de Lima MC, da Cruz Filho IJ.
11-03-2023
Exp Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36907541/

In this work, 13 thiosemicarbazones (1a - m) and 16 thiazoles (2a - p) were obtained, which were properly characterized by spectroscopic and spectrometric techniques. The pharmacokinetic properties obtained in silico revealed that the derivatives are in accordance with the parameters established by lipinski and veber, showing that such compounds have good bioavailability or permeability when administered orally. In assays of antioxidant activity, thiosemicarbazones showed moderate to high antioxidant potential when compared to thiazoles. In addition, they were able to interact with albumin and DNA. Screening assays to assess the toxicity of compounds to mammalian cells revealed that thiosemicarbazones were less toxic when compared to thiazoles. In relation to in vitro antiparasitic activity, thiosemicarbazones and thiazoles showed cytotoxic potential against the parasites Leishmania amazonensis and Trypanosoma cruzi. Among the compounds, 1b, 1j and 2l stood out, showing inhibition potential for the amastigote forms of the two parasites. As for the in vitro antimalarial activity, thiosemicarbazones did not inhibit Plasmodium falciparum growth. In contrast, thiazoles promoted growth inhibition. This study shows in a preliminary way that the synthesized compounds have antiparasitic potential in vitro.

The potential effect of silver nanoparticles synthesized with Coffea arabica green seeds on Leishmania major proliferation, cytotoxicity activity, and cytokines expression level.

Sharifi F, Mohamadi N, Tavakoli Oliaee R, Sharifi I, Doostmohammadi M, Soltanian S, Sharififar F.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910317/

Takayasu Arteritis Coexisting with Cutaneous Leishmaniasis.

Zhao M, Liu Y, Hu Z, Sun J, Yang Z, Wei L, Xu Z, Ma L.
24-02-2023
J Clin Med.
https://pubmed.ncbi.nlm.nih.gov/36902606/

Fatty Acid Composition and Metabolism in Leishmania Parasite Species: Potential Biomarkers or Drug Targets for Leishmaniasis?

Leroux M, Luquain-Costaz C, Lawton P, Azzouz-Maache S, Delton I.
28-02-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36902138/

Fatty acids have received growing interest in *Leishmania* biology with the characterization of the enzymes allowing the complete fatty acid synthesis of this trypanosomatid parasite. This review presents a comparative analysis of the fatty acid profiles of the major classes of lipids and phospholipids in different species of *Leishmania* with cutaneous or visceral tropism. Specificities relating to the parasite forms, resistance to antileishmanial drugs, and host/parasite interactions are described as well as comparisons with other trypanosomatids. Emphasis is placed on polyunsaturated fatty acids and their metabolic and functional specificities, in particular, their conversion into oxygenated metabolites that are inflammatory mediators able to modulate metacyclogenesis and parasite infectivity. The impact of lipid status on the development of leishmaniasis and the potential of fatty acids as therapeutic targets or candidates for nutritional interventions are discussed.

Genetic variability highlights the invasion route of the Lutzomyia longipalpis complex, the main vector of Visceral Leishmaniasis in Uruguay.

Andrés C, Sebastián P, Telma G, Ana V, Lorenzo V, Sofia P, Gabriela W, Pablo F, Yester B.
10-03-2023
Zoonoses Public Health.
https://pubmed.ncbi.nlm.nih.gov/36898974/

Retraction: Genetic Manipulation of Leishmania donovani to Explore the Involvement of Argininosuccinate Synthase in Oxidative Stress Management.

PLOS Neglected Tropical Diseases Editors.
13-03-2023
PLoS Negl Trop Dis.

https://pubmed.ncbi.nlm.nih.gov/36897836/

Malaria and leishmaniasis: Updates on co-infection.

Ornellas-Garcia U, Cuervo P, Ribeiro-Gomes FL.
21-02-2023
Front Immunol.
https://pubmed.ncbi.nlm.nih.gov/36895563/

Polyunsaturated fatty acids alter the formation of lipid droplets and eicosanoid production in Leishmania promastigotes.

Andrade YMFS, Castro MV, Tavares VS, Souza RDSO, Faccioli LH, Lima JB, Sorgi CA, Borges VM, Araújo-Santos T.
06-03-2023
Mem Inst Oswaldo Cruz.
https://pubmed.ncbi.nlm.nih.gov/36888851/

Background: The knowledge about eicosanoid metabolism and lipid droplet (LD) formation in the Leishmania is very limited and new approaches are needed to identify which bioactive molecules are produced of them. Objectives: Herein, we compared LDs and eicosanoids biogenesis in distinct Leishmania species which are etiologic agents of different clinical forms of leishmaniasis. Methods: For this, promastigotes of Leishmania amazonensis, L. braziliensis and L. infantum were stimulated with polyunsaturated fatty acids (PUFA) and LD and eicosanoid production was evaluated. We also compared mutations in structural models of human-like cyclooxygenase-2 (GP63) and prostaglandin F synthase (PGFS) proteins, as well as the levels of these enzymes in parasite cell extracts. Findings: PUFAs modulate the LD formation in L. braziliensis and L. infantum. Leishmania spp with equivalent tissue tropism had same protein mutations in GP63 and PGFS. No differences in GP63 production were observed among Leishmania spp, however PGFS production increased during the parasite differentiation. Stimulation with arachidonic acid resulted in elevated production of hydroxyeicosatetraenoic acids compared to prostaglandins. Main conclusions: Our data suggest LD formation and eicosanoid production are distinctly modulated by PUFAS dependent of Leishmania species. In addition, eicosanoid-enzyme mutations are more similar between Leishmania species with same host tropism.

Cutaneous leishmaniasis by a needlestick injury, an occupational infection?

Perales-González A, Pérez-Garza DM, Garza-Dávila VF, Ocampo-Candiani J.
08-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36888575/

Leishmaniasis is a parasitic disease caused by over 20 species of Leishmania. Transmission is mainly via sandfly bites infected with promastigotes, through the placenta from mother to child, by sexual intercourse, blood transfusion, and occupationally acquired by direct inoculation into the skin. Clinical manifestations vary from self-limited cutaneous disease to a life-threatening visceral infection. In November 2021, a 29-year-old otherwise healthy dermatology resident suffered an accidental needlestick injury while performing a biopsy on a patient with a presumptive diagnosis of an infectious dermatosis, later confirmed as mucocutaneous leishmaniasis caused by Leishmania panamensis. Later, the resident developed an erythematous, painless papule at the point of inoculation, with a central ulcer and painful enlargement of ipsilateral lymph nodes. Biopsy was compatible with leishmaniasis. After completing a 20-day treatment with meglumine antimoniate, the ulcer had healed completely. At the 6-month follow-up, both patients remain asymptomatic. This case serves as a reminder that health providers should have the proper training and knowledge of their hospital management protocol for occupational injuries. Moreover, physicians should bear in mind that leishmaniasis is not exclusively transmitted by sandfly vectors.

Computer-Aided drug design of new 2-amino-thiophene derivatives as anti-leishmanial agents.

Luna IS, Souza TA, da Silva MS, Franca Rodrigues KAD, Scotti L, Scotti MT, Mendonça-Junior FJB.
15-03-2023
Eur J Med Chem.
https://pubmed.ncbi.nlm.nih.gov/36848847/

Bestatin analogs-4-quinolinone hybrids as antileishmanial hits: Design, repurposing rational, synthesis, in vitro and in silico studies.

Hassan AHE, Mahmoud K, Phan TN, Shaldam MA, Lee CH, Kim YJ, Cho SB, Bayoumi WA, El-Sayed SM, Choi Y, Moon S, No JH, Lee YS.
15-03-2023
Eur J Med Chem.
https://pubmed.ncbi.nlm.nih.gov/36827952/

Novel Pyrido[2',1':2,3]imidazo[4,5-c]quinoline Derivative Selectively Poisons Leishmania donovani Bisubunit Topoisomerase 1 to Inhibit the Antimony-Resistant Leishmania Infection in Vivo.

Chowdhuri SP, Dhiman S, Das SK, Meena N, Das S, Kumar A, Das BB.
09-03-2023
J Med Chem.
https://pubmed.ncbi.nlm.nih.gov/36823782/

Exploring drug repositioning for leishmaniasis treatment: Ivermectin plus polymeric micelles induce immunological response and protection against tegumentary leishmaniasis.

Freitas CS, Lage DP, Machado AS, Vale DL, Martins VT, Cardoso JMO, Oliveira-da-Silva JA, Reis TAR, Tavares

GSV, Ramos FF, Ludolf F, Pereira IAG, Bandeira RS, Fujiwara RT, Bueno LL, Roatt BM, Chávez-Fumagalli MA, Coelho EAF.
Apr-2023
Cytokine.
https://pubmed.ncbi.nlm.nih.gov/36774730/

Label-Free Mass Spectrometry Proteomics Reveals Different Pathways Modulated in THP-1 Cells Infected with Therapeutic Failure and Drug Resistance Leishmania infantum Clinical Isolates.

Tagliazucchi L, Perea-Martinez A, Fiorini G, Manzano JI, Genovese F, García-Hernández R, Pinetti D, Gamarro F, Costi MP.
10-03-2023
ACS Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36762976/

As the world is facing increasing difficulties to treat leishmaniasis with current therapies, deeper investigation into the molecular mechanisms responsible for both drug resistance and treatment failure (TF) is essential in drug discovery and development. So far, few available drugs cause severe side effects and have developed several resistance mechanisms. Drug resistance and TF parasite strains from clinical isolates may have acquired altered expression of proteins that characterize specific mechanisms leading to therapy inefficacy. This work aims to identify the biochemical pathways of THP-1 human monocytes infected by different *Leishmania infantum* clinical isolates from patients with either resistance or with TF outcome, using whole cell differential Mass Spectrometry proteomics. We have adopted network enrichment analysis to integrate the transcriptomics and the proteomic results of infected cells studies. Transferrin receptor C (TFRC) and nucleoside diphosphate kinase 3 (NDK3) were discovered as overexpressed proteins in THP-1 cells infected with paromomycin, antimony, and miltefosine resistant *L. infantum* lines. The overall achievements represent founding concepts to confirm new targets involved in the parasitic drug resistance and TF mechanisms, and to consider in perspective the importance of a dual host-guest pharmacological approach to treat the acute stage of the disease.

Pathological roles of macrophages in Leishmania infections.

Goto Y, Mizobuchi H.
Jun-2023
Parasitol Int.
https://pubmed.ncbi.nlm.nih.gov/36738983/

In Vitro and In Silico Studies of Kinase Inhibitor of MAPK3 Protein to Determine Leishmania martiniquensis Treatment.

Aiebchun T, Rasri N, Kiriwan D, Siripattanapipong S, Choowongkomon K.
Mar-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36637694/

Enriched PUFA environment of Leishmania infantum promastigotes promotes the accumulation of lipid mediators and favors parasite infectivity towards J774 murine macrophages.

Leroux M, Bouazizi-Ben Messaoud H, Luquain-Costaz C, Jordheim LP, Le Faouder P, Gustin MP, Aoun K, Lawton P, Azzouz-Maache S, Delton I.
Mar-2023
Lipids.
https://pubmed.ncbi.nlm.nih.gov/36544247/

Leishmania parasites are the causative agents of visceral or cutaneous leishmaniasis in humans and of canine leishmaniosis. The macrophage is the predilected host cell of Leishmania in which the promastigote stage is transformed into amastigote. We previously showed changes in the fatty acid composition (FA) of lipids in two strains of Leishmania donovani upon differentiation of promastigote to amastigote, including increased proportions of arachidonic acid (AA) and to a less extent of docosahexaenoic acid (DHA). Here, we carried out supplementation with AA or DHA on two Leishmania infantum strains, a visceral (MON-1) and a cutaneous (MON-24), to evaluate the role of these FA in parasite/macrophage interactions. The proportions of AA or DHA in total lipids were significantly increased in promastigotes cultured in AA- or DHA-supplemented media compared to controls. The content of FA-derived oxygenated metabolites was enhanced in supplemented strains, generating especially epoxyeicosatrienoic acids (11,12- and 14,15-EET) and hydroxyeicosatetraenoic acids (5- and 8- HETE) from AA, and hydroxydocosahexaenoic acids (14- and 17-HDoHE) from DHA. For both MON-1 and MON-24, AA-supplemented promastigotes showed higher infectivity towards J774 macrophages as evidenced by higher intracellular amastigote numbers. Higher infectivity was observed after DHA supplementation for MON-24 but not MON-1 strain. ROS production by macrophages increased upon parasite infection, but only minor change was observed between control and supplemented parasites. We propose that under high AA or DHA environment that is associated with AA or DHA enrichment of promastigote lipids, FA derivatives can accumulate in the parasite, thereby modulating parasite infectivity towards host macrophages.

Leishmania mexicana Lipophosphoglycan Activates Dermal γδ T Cells with Participation of TLR2.

Soto-Olguín N, Zamora-Chimal J, Delgado-Domínguez J, Becker I.
Mar-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36434381/

Antileishmanial Effects of Bunium Persicum Crude Extract, Essential Oil, and Cuminaldehyde on Leishmania Major: In Silico and In Vitro Properties.

Mohamadi N, Sharifi I, Afgar A, Sharififar F, Sharifi F.
Mar-2023

Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36434380/

The unique bisubunit structure of *Leishmania donovani* topoisomerase 1B (LdTop1) is a potential drug target in the parasites unlike the monomeric Top1 from its human host counterpart. Here, we report the design, synthesis, and validation of a chimeric pyrido[2',1':2,3]imidazo[4,5-*c*]quinoline derivative (**C17**) as a novel antileishmanial agent that poisons topoisomerase 1-DNA covalent complexes (LdTop1cc) inside the parasites and inhibits Top1 religation activity both in the drug sensitive and antimony-resistant *L. donovani* clinical isolates. Importantly, the human Top1 is not sensitive to **C17**. Further, **C17** overcomes the chemical instability of camptothecin (CPT) by generating persistent LdTop1cc-induced DNA breaks inside the parasites even after 12 h of drug removal. Intraperitoneal administration of **C17** results in marked reduction of the *Leishmania* amastigotes from the infected spleen and liver of BALB/c mice. **C17** confers a host protective immune-response up-regulating the Th1 cytokines facilitating parasite clearance which can be exploited for treating drug-resistant leishmaniasis.

In Vitro Determination of Antileshmanial Activities of Benzimidazolium Derivatives on L. major Promastigotes and Amastigotes.

Kelleci K, Gölebatmaz E.
Mar-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36348181/

Purpose: Leishmaniasis is a serious public health problem infecting millions of people worldwide. An effective and reliable treatment method to be used in the treatment of the disease has not been developed yet. **Methods:** In this article, the anti-leishmanial activities of two benzimidazolium derivatives (B.A and B.B) against Leishmania major promastigotes and amastigotes, which are known to cause cutaneous leishmaniasis, were investigated for the first time. The immunostimulatory activity of the developed formulations was determined using the J774 murine macrophage cell line. **Results:** B.A and B.B compounds were found to have a much higher cytotoxic effect than Amphotericin B (IC_{50} value 0.75 µM ± 0.03), which is used as the reference drug. The IC_{50} value was determined as 2.02 µM ± 0.52 for B.A and 1.83 µM ± 0.71 for B.B in Leishmania promastigotes. In addition, IC_{50} values of B. A and B.B Leishmania amastigotes were found to be 1.01 µM and 0.67 µM, respectively. It was found that B.B was 81.12 times more selective than Amphotericin B and showed the highest selectivity against L. major promastigotes (359.09) and amastigotes (980.80). Considering the selectivity indices (SI) of B.A and B.B, both compounds tested are more promising than Amphotericin B. **Conclusion:** The results showed that benzimidazolium derivatives have anti-leishmanial potential against L. major, which is the causative agent of cutaneous leishmaniasis. Thus, we can say that the obtained results will help the development of effective and safe antileishmanial drug formulations against cutaneous leishmaniasis.

Cysticercose

Severe Neurocysticercosis in an Immunocompetent Male Without Travel to an Endemic Region: A Case Report.

Sakhuja A, Kc S, Wortsman J, Shrestha DB, Aryal BB, Kwatra V, Verda L.
11-02-2023
Cureus.
https://pubmed.ncbi.nlm.nih.gov/36923196/

Dracunculose

Transcriptome analysis reveals important regulatory genes and pathways for tuber color variation in Pinellia ternata (Thunb.) Breit.

Yin C, Tang D, Liu X, Li Z, Xiang Y, Gao K, Li H, Yuan L, Huang B, Li J.
15-03-2023
Protoplasma.
https://pubmed.ncbi.nlm.nih.gov/36918417/

During the growth of Pinellia ternata (Thunb.) Breit. (P. ternata), the violet-red skin was occasionally produced spontaneously under natural cultivation. However, the specific mechanism leading to the color change is still unclear. This study performed transcriptomes in violet-red and pale-yellow skin and their peeled tubers of P. ternata, and the total flavonoids and anthocyanin contents were also determined. The results showed that the majority of genes involved in anthocyanin production were considerably increased in the violet-red skin of P. ternata tuber compared to the pale-yellow skin. Especially, phenylalanine ammonia-lyase (PAL) and chalcone synthase (CHS) showed a remarkable increase in gene expression levels. Notably, shikimate O-hydroxycinnamoyltransferase (HCT), naringenin 3-dioxygenase (F3H), flavanone 4-reductase (DFR), and anthocyanidin synthase (ANS) were explicitly expressed in violet-red skin of P. ternata tuber, while undetectable in pale-yellow skin. The upregulation of these genes may explain the accumulation of anthocyanins, which forms the violet-red skin of P. ternata tuber. The transcription factors, including C2H2, bZIP, ERF, GATA, bHLH, C3H, NAC, MYB-related, and MYB families, might trigger the skin color change in P. ternata. The entire anthocyanin content in the violet-red skin of P. ternata tuber was 71.10 µg/g, and pale-yellow skin was 7.74 µg/g. According to phenotypic and transcriptome results, the elevated expression levels of genes linked to the synthesis of anthocyanins considerably contributed to the violet-red skin alterations in P. ternata tuber. This study provides a new understanding of the formation of the violet-red skin, lays a theoretical foundation for the cultivation of unique varieties of P. ternata, and provides transcriptome data for further study of the differences between different colors of P. ternata.

Chitosan Spraying Enhances the Growth, Photosynthesis, and Resistance of

Continuous Pinellia ternata and Promotes Its Yield and Quality.

Chen F, Li Q, Su Y, Lei Y, Zhang C.
22-02-2023
Molecules.
https://pubmed.ncbi.nlm.nih.gov/36903297/

Bacillus cereus WL08 immobilized on tobacco stem charcoal eliminates butylated hydroxytoluene in soils and alleviates the continuous cropping obstacle of Pinellia ternata.

Zhang C, Zhang Q, Luo M, Wang Q, Wu X.
15-05-2023
J Hazard Mater.
https://pubmed.ncbi.nlm.nih.gov/36870095/

Butylated hydroxytoluene (BHT), as an emerging contaminant in ecosystems, has potential influences on animals, aquatic organisms, and public health, and has been proven to be a major allelochemical of Pinellia ternata. In this study, Bacillus cereus WL08 was used to rapidly degrade BHT in liquid culture. Strain WL08 immobilized on tobacco stem charcoal (TSC) particles notably accelerated BHT removal in contract to its free cells, and exhibited excellent reutilization and storage capacities. The optimal removal parameters of TSC WL08 were ascertained to be pH 7.0, 30 °C, 50 mg L^{-1} BHT and 0.14 mg L^{-1} TSC WL08. Moreover, TSC WL08 significantly accelerated the degradation of 50 mg L^{-1} BHT in sterile and non-sterile soils compared to that of free WL08 or natural dissipation, and notably shortened their half-lives by 2.47- or 362.14- fold, and 2.20- or 14.99- fold, respectively. Simultaneously, TSC WL08 was introduced into the continuous cropping soils of P. ternata, which accelerated the elimination of allelochemical BHT, and notably enhanced the photosynthesis, growth, yield, and quality of P. ternata. This study provides new insights and strategies for the rapid in situ remediation of BHT-polluted soils and effective alleviation of P. ternata cropping obstacles.

A novel cultivation platform of duckweed (Lemna minor) via application of beeswax superhydrophobic coatings.

Chua MX, Cheah YT, Tan WH, Chan DJC.
01-05-2023
Environ Res.
https://pubmed.ncbi.nlm.nih.gov/36822535/

Multigenerational effects of microplastic fragments derived from polyethylene terephthalate bottles on duckweed Lemna minor: Size-dependent effects of microplastics on photosynthesis.

Cui R, Kwak JI, An YJ.
10-05-2023
Sci Total Environ.
https://pubmed.ncbi.nlm.nih.gov/36775180/

Effects of Arum dioscoridis Extract on Hepatic Toxicity Caused by Thioacetamide in Rats.

Sökmen MF, İspiroğlu M, Gişi K, Bahar AY, Kurutaş EB, Kantarçeken B.
Mar-2023
Turk J Gastroenterol.
https://pubmed.ncbi.nlm.nih.gov/36635913/

Background: The aim of this study was to investigate the prophylactic and therapeutic effects of Arum dioscoridis (tirsik) plant extract against thioacetamide-induced experimental liver toxicity. Methods: In this study, 35 male Wistar-Albino rats, of 12-14 weeks old, weighing between 200 and 270 g, were used. Rats were divided into 5 groups of 7 each. The first group was determined as the control group, the second group as the hepatotoxicity group, the third group as the prophylaxis group, the fourth group as the intraperitoneal treatment group, and the fifth group as the oral treatment group. Hepatotoxicity was achieved with a single intraperitoneal dose of 350 mg/kg of thioacetamide (TAA). On the seventh day, the rats were sacrificed under general anesthesia. Their blood was taken and liver enzymes were studied. Malondialdehyde (MDA), glutathyon peroxi dase (GPx), catalase (CAT), superoxit dismutase (SOD) enzymes were studied from liver tissues. In addition, liver tissues were evaluated histopathologically. Results: With Arum dioscoridis treatment and prophylaxis, improvements in all parameters and increases in tissue antioxidant levels were detected. Conclusion: It was determined that Arum dioscoridis plant extract has prophylactic and therapeutic effects on liver toxicity. In cases of acute liver injury and hepatotoxicity, we suggest the potential application of Arum dioscoridis for effective and inexpensive treatment.

Echinococcose

[Evaluation of the knowledge on alveolar echinococcosis among general practitioners in the province of Liege : impact of a formative intervention].

Boulanger M, Léonard P, Egrek S, Detry O, Hayette MP.
Mar-2023
Rev Med Liege.
https://pubmed.ncbi.nlm.nih.gov/36924153/

Hydatid cyst of the psoas: case report and review of literature.

Mhand M, Ramdani A, Khomssi N, Rhoul C, Bouhout T, Serji B, El Harroudi T.
09-03-2023
Ann Med Surg (Lond).
https://pubmed.ncbi.nlm.nih.gov/36923744/

Hydatid disease (HD) is a parasitic pathology that remains endemic in Morocco and poses a public health problem. Its location in the psoas muscle is a rare entity. We report this case highlighting the diagnostic challenges, therapeutic modalities as well as prognosis. Case presentation: We report the case of a 40-year-old male patient without a notable pathological history, referred to

our department for management of a paravertebral hydatid cyst mass with fluid density and scalloping on the verteral body on thoraco-abdomino-pelvic computed tomography scan. After a pretherapeutic assessment, the patient underwent an exploratory laparotomy which objective a deep right laterovertebral mass. The patient underwent a resection of the protruding dome, lavage using hydrogen peroxide and drainage of the residual cavity. The patient recovered well and was discharged 5 days later on albendazole 10 mg/kg/d. The anatomopathological analysis of the specimen confirmed the diagnosis of hydatid cyst. The evolution was satisfactory for the patient with a recall of 6 months. Discussion: Hydatidosis is an anthropozonosis caused by the larval form of *Echinococcus granulosus*. It can reach the psoas muscle by great circulation. The diagnosis of HD in the psoas is often difficult. Biology and imaging confirm the diagnosis and the standard treatment remains surgery. Conclusion: HD of the psoas is a rare entity. The diagnosis is based on biology and imaging, and radical treatment is surgery.

MicroRNA-Transcription factor regulatory networks in the early strobilar development of Echinococcus granulosus protoscoleces.

Mohammadi MA, Mansouri M, Derakhshani A, Rezaie M, Borhani M, Nasibi S, Mousavi SM, Afgar A, Macchiaroli N, Rosenzvit MC, Harandi MF.
15-03-2023
BMC Genomics.
https://pubmed.ncbi.nlm.nih.gov/36922762/

Investigation of the mechanism of action of mefloquine and derivatives against the parasite Echinococcus multilocularis.

Memedovski R, Preza M, Müller J, Kämpfer T, Rufener R, de Souza MVN, da Silva ET, de Andrade GF, Braga S, Uldry AC, Buchs N, Heller M, Lundström-Stadelmann B.
09-03-2023
Int J Parasitol Drugs Drug Resist.
https://pubmed.ncbi.nlm.nih.gov/36921443/

Alveolar echinococcosis (AE) is caused by infection with the fox tapeworm E. multilocularis. The disease affects humans, dogs, captive monkeys, and other mammals, and it is caused by the metacestode stage of the parasite growing invasively in the liver. The current drug treatment is based on non-parasiticidal benzimidazoles. Thus, they are only limitedly curative and can cause severe side effects. Therefore, novel and improved treatment options for AE are needed. Mefloquine (MEF), an antimalarial agent, was previously shown to be effective against E. multilocularis in vitro and in experimentally infected mice. However, MEF is not parasiticidal and needs improvement for successful treatment of patients, and it can induce strong neuropsychiatric side-effects. In this study, the structure-activity relationship and mode of action of MEF was investigated by comparative analysis of 14 MEF derivatives. None of them showed higher activity against E. multilocularis metacestodes compared to MEF, but four compounds caused limited damage. In order to identify molecular targets of MEF and effective derivatives, differential affinity chromatography combined with mass spectrometry was performed with two effective compounds (MEF, MEF-3) and two ineffective compounds (MEF-13, MEF-22). 1'681 proteins were identified that bound specifically to MEF or derivatives. 216 proteins were identified as binding only to MEF and MEF-3. GO term enrichment analysis of these proteins and functional grouping of the 25 most abundant MEF and MEF-3 specific binding proteins revealed the key processes energy metabolism and cellular transport and structure, as well as stress responses and nucleic acid binding to be involved. The previously described ferritin was confirmed as an exclusively MEF-binding protein that could be relevant for its efficacy against E. multilocularis. The here identified potential targets of MEF will be further investigated in the future for a clear understanding of the pleiotropic effects of MEF, and improved therapeutic options against AE.

Primary intramuscular and intermuscular Echinococcal disease of the iliopsoas and sartorius muscles: A case report.

Vu DM, Adaramola OS, Freyre K, Mathews SG, Beltran J, Opsha O.
27-02-2023
Radiol Case Rep.
https://pubmed.ncbi.nlm.nih.gov/36915610/

Hydatid disease is a parasitic infection caused by the *Echinococcus* tapeworm. Classically, Echinococcal lesions are slowly growing cystic masses with daughter cysts. The most common sites of disease are the liver in 75% of cases and lungs in 15% of cases. This report covers a case of a patient from Southeast Europe with primary extrahepatic hydatid disease in and along the left iliopsoas and sartorius muscles. Retroperitoneal and soft tissue Echinococcus infection without liver involvement is extremely rare and creates a diagnostic challenge for clinicians and radiologists, especially in nonendemic areas.

IEg67 kDa Bovine Hydatid Cyst Antigen: A Candidate for Developing Sero-Diagnostic Assays for Cystic Echinococcosis, a Disease of One Health Importance.

Khan S, Cable J, Younus M, Rashid MI, Hailer F, Akbar H.
27-02-2023
Animals (Basel).
https://pubmed.ncbi.nlm.nih.gov/36899724/

Off-Pump Resection of Giant Intramural Left Ventricular Hydatid Cyst by Pleuropericardial Approach: a Case Report.

Shah D, Gupta K, Naik D, Dholakia H, Madan S.
10-02-2023
Braz J Cardiovasc Surg.
https://pubmed.ncbi.nlm.nih.gov/36897822/

Primary cardiac hydatid cyst is a rare and fatal pathology, especially when involving the left ventricular free wall. A

44-year-old male was diagnosed with large intramural left ventricular hydatid cyst with wall thickness of 6 mm at the thinnest point. Cyst was accessed through pleuropericardial approach (left pleura opened, followed by entry into cyst directly through adjacent pericardium without removing the pericardial adhesions) which resulted in easy entry into the cyst, mitigating the risk of mechanical injury. This case report highlights that with detailed evaluation, cardiac hydatidosis can be addressed with off-pump technique, reducing the anaphylaxis risks and cardiopulmonary bypass-related effects.

Hydatid Disease: A Pictorial Review of Uncommon Locations.

Khalili N, Iranpour P, Khalili N, Haseli S.
Mar-2023
Iran J Med Sci.
https://pubmed.ncbi.nlm.nih.gov/36895460/

Primary giant splenic hydatid disease in a pregnant woman: case report.

Segura-Gago GP, Estela-Reynel R, Calisaya-Sánchez M, Flores-Rodriguez M.
Oct-Dec2022
Rev Peru Med Exp Salud Publica.
https://pubmed.ncbi.nlm.nih.gov/36888814/

Hydatidosis is currently considered a public health problem in Peru. It is a parasitic infection transmitted by the ingestion of eggs of Echinococcus granulosus. The most involved organs are the liver and lungs, with spleen involvement being rare. We present the case of a young pregnant woman with abdominal pain and a sensation of mass in the left hypochondrium. The ultrasound study revealed a multiloculated cystic image in the left hemiabdomen, and a viable fetus. She underwent cesarean section, followed by exploratory laparotomy, which revealed a giant spleen tumor that, according to the anatomopathological study, corresponded to multicystic splenic hydatid disease. Likewise, intrauterine growth restriction was found as a fetal complication. The patient progressed favorably without recurrence of hydatid foci and the neonate had an adequate growth pattern.

Can Echinococcus granulosus-Derived MicroRNAs be Biomarkers for Diagnosis and Follow-up of Cystic Echinococcosis Patients?

Fasihi Karami M, Beiromvand M, Rafiei A, Dayer D, Rahdar M, Bahreini A, Dastyar AA.
Mar-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36637695/

Serum Level of egr-miR-2a-3p as a Potential Diagnostic Biomarker for Cystic Echinococcosis.

Karami MF, Beiromvand M, Rafiei A, Dayer D, Rahdar M, Bahreini A, Dastyar AA.
Mar-2023
Acta Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36434379/

Introduction: Cystic Echinococcosis (CE) is a chronic parasitic disease caused by the metacestodes of Echinococcus granulosus senso lato (E. granulosus s.l.). The larval stages of this parasite, hydatid cyst, are usually diagnosed using imaging modalities and serological testing; however, several studies have recently suggested using the parasite-derived microRNAs (miRNAs) as novel diagnostic biomarkers. **Materials and methods:** The present study included 31 CE patients who were older than 5 years and were admitted to the hospitals of Ahvaz, Iran for hydatid cyst removal surgery during 2019-2021. The egr-miR-125-5p and egr-miR-2a-3p levels were evaluated in the sera of the CE patients before and 6 months after the surgery using Quantitative Real-Time PCR (qRT-PCR), and the results were compared with the serum samples from 15 healthy volunteers. Then, the intergroup comparisons were performed using the t test. **Results:** The patients' age range was 6-72 years, with a mean age of 34.6 years. Moreover, based on the classification by the WHO-IWGE, one patient (3.2%) had CE1, 14 patients (45.2%) had CE2, 5 patients (16.1%) had CE3, 2 patients (6.5%) had CE4, and 9 patients (29%) had CE5. Also, 21 patients (67.74%) had a positive antigen test using the ELISA method, while 10 patients (32.26%) had a negative ELISA. The pre-operative expression level of egr-miR-2a-3p was 10.36 folds higher compared to 6 months after the surgery, with an AUC value of 0.8176. However, the expression levels of egr-miR-125-5p did not change significantly 6 months after the surgery compared to pre-operative levels. **Conclusions:** According to the present study results, the serum levels of egr-miR-2a-3p can be a promising non-invasive biomarker for diagnosing CE and monitoring its potential recurrence after cystectomy.

CT Imaging Findings of Pulmonary Alveolar Echinococcosis.

Eroglu A, Ogul H, Aydin Y.
2023
Curr Med Imaging.
https://pubmed.ncbi.nlm.nih.gov/35088676/

Trématodoses d'origine alimentaire (clonorchiase, opisthorchiase, fasciolase et paragonimose

Community burden of intestinal parasites and its public health concerns in Obizi, Amakama Olokoro, Umuahia South, Abia State, Nigeria.

Okosa C, Ukpai OM, Lawrence QO.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910319/

[A case report:the progress of fascioliasis from hepatic phase to biliary phase].

Okano F, Harusato A, Tokuda B, Taketani H, Ishiba H, Fukui A, Omatsu T, Okayama T, Satoh O, Imura T, Okita M, Katada K, Itoh Y.
2023
Nihon Shokakibyo Gakkai Zasshi.
https://pubmed.ncbi.nlm.nih.gov/36908146/

This is a case report of fascioliasis that progressed from the hepatic to the biliary phases over 2 years. A woman in her late 60s ate Zingiber mioga from the field, which was followed by abdominal pain that occurred 1 month later. Although CT and MRI studies revealed an increase in blood eosinophils as well as multiple hepatic nodules, they vanished quickly. After 2 years, an MRCP study revealed multiple flat lesions, which were diagnosed as adult fascioliasis. Definitive diagnosis was provided by enzyme-labeled antibody method using fasciola-specific antigen. Triclabendazole was administered once to complete the treatment.

Systematic review of cholangiocarcinoma in Africa: epidemiology, management, and clinical outcomes.

Asombang AW, Chishinga N, Mohamed MF, Nkhoma A, Chipaila J, Nsokolo B, Manda-Mapalo M, Montiero JFG, Banda L, Dua KS.
11-03-2023
BMC Gastroenterol.
https://pubmed.ncbi.nlm.nih.gov/36906562/

Juvenile Fasciola gigantica emerging through the skin in a returning traveller.

Van Den Broucke S, Vandecasteele S, Van Esbroeck M, Dorny P, Dermauw V, De Jong T, Bottieau E, Vereecken H, Potters I, Paredis L.
10-03-2023
J Travel Med.
https://pubmed.ncbi.nlm.nih.gov/36897274/

Massive secretions in paragonimiasis pleural effusion: a new finding concerning clinical recognition and treatment.

Zhang Y, Xie Y, Luo Y, Xiang S, Zhong W, Wu N, Chen M, Zhou X, Peng S, Chen Q.
Apr-2023
Eur J Clin Microbiol Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36826718/

Some paragonimiasis patients in Chongqing, southwest China, have recently exhibited pleural effusions (PEs) with massive viscous secretions. This study aimed to investigate their clinical characteristics, thereby promoting effective treatments. A 3-year retrospective review of paragonimiasis patients who were admitted for nonhomogeneous PEs at Chongqing University Three Gorges Hospital was conducted. Epidemiological data, symptoms, laboratory and imaging findings, treatments, and outcomes were analyzed. Twenty-eight patients were identified, of which 22 (78.6%) were males and 22 (78.6%) were rural residents. Respiratory (85.7%) and constitutional (57.1%) symptoms were common. Paragonimus-specific ELISA was positive in all patients. Eosinophilia was detected in all patients in peripheral blood and PEs. Irregular hyperdense signals were observed in PEs by chest CT scans (96.4%) and ultrasonography (100.0%). Thoracic closed drainage failed in 10 patients (conservative group) because of tube blockage and was eventually replaced by video-assisted thoracoscopic surgery (VATS). Eighteen patients (surgery group) initially underwent VATS, or thoracotomy surgery, without complications. Massive secretions, described as "bean-dregs" or "egg-floccule," were detected intraoperatively, which explained the imaging findings and tube blockage. All patients recovered well after 2-3 courses of postoperative praziquantel treatment. Viscous secretions in paragonimiasis patients warrant great concern. Irregular hyperdense signals in effusions are important characteristics in CT scans and ultrasonography. Treatments such as thoracic closed drainage may fail due to viscous secretions blocking the tube; therefore, surgeries should be considered. In-depth multidisciplinary research may help determine the optimal treatment strategy and reveal the origin of these secretions.

Preparation of polyclonal anti-Schistosoma mansoni cysteine protease antibodies for early diagnosis.

Farid A.
Mar-2023
Appl Microbiol Biotechnol.
https://pubmed.ncbi.nlm.nih.gov/36773062/

In many parts of the tropics, schistosomiasis is a major parasitic disease second only to malaria as a cause of morbidity and mortality. Diagnostic approaches include microscopic sampling of excreta such as the Kato-Katz method, radiography, and serology. Due to their vital role in many stages of the parasitic life cycle, proteases have been under investigation as targets of immunological or chemotherapeutic anti-Schistosoma agents. Five major classes of protease have been identified on the basis of the peptide hydrolysis mechanism: serine, cysteine, aspartic, threonine, and metalloproteases. Proteases of all five catalytic classes have been identified from S. mansoni through proteomic or genetic analysis. The study aimed to produce polyclonal antibodies (pAbs) against schistosomal cysteine proteases (CP) to be used in the diagnosis of schistosomiasis. This study was conducted on S. mansoni-infected patients from highly endemic areas and from outpatients' clinic and hospitals and other patients infected with other parasites (Fasciola, hookworm, hydatid, and trichostrongyloids). In this study, the produced polyclonal antibodies against S. mansoni cysteine protease antigens were labeled with horseradish peroxidase (HRP) conjugate and used to detect CP antigens in stool and serum samples of S. mansoni-infected patients by sandwich ELISA. The study involved 200 S. mansoni-infected patients (diagnosed by finding characteristic eggs in the collected stool samples), 100 patients infected with other parasites (Fasciola,

hookworm, hydatid, and trichostrongyloids), and 100 individuals who served as parasite-free healthy negative control. The prepared pAb succeeded in detecting CP antigens in stool and serum samples of S. mansoni-infected patients by sandwich ELISA with a sensitivity of 98.5% and 98.0% respectively. A positive correlation was observed between S. mansoni egg counts and both stool and serum antigen concentrations. Purified 27.5 kDa CP could be introduced as a suitable candidate antigen for early immunodiagnosis using sandwich ELISA for antigen detection. KEY POINTS: • Detection of cysteine protease antigens can replace parasitological examination. • Sandwich ELISA has a higher sensitivity than microscopic examination of eggs. • Identification of antigens is important for the goal of obtaining diagnostic tools.

Copper chloride and copper sulphate in combination with nitroxynil against gastrointestinal nematodes of ruminants: A possible hitchhiking synergic effect at low concentrations.

Juliana Ribeiro Dolenga C, Dos Anjos A, José Arruda E, Beltrão Molento M.
Mar-2023
Int J Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36657612/

Persistent advanced periductal fibrosis is and helicobacter pylori infection in post-treatment of opisthorchiasis: Correspondence.

Mungmunpuntipantip R, Wiwanitkit V.
Apr-2023
Helicobacter.
https://pubmed.ncbi.nlm.nih.gov/36910319/

Filariose lymphatique

Evaluation of opportunities to implement community-wide mass drug administration for interrupting transmission of soil-transmitted helminths infections in India.

Aruldas K, Dawson K, Saxena M, Titus A, Johnson J, Gwayi-Chore MC, Muliyil J, Kang G, Walson JL, Khera A, Ajjampur SSR, Means AR.
10-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36897877/

Background: The World Health Organization Neglected Tropical Disease (NTD) guidelines recommend control of soil transmitted helminth (STH)-associated morbidity with targeted deworming of preschool and school-aged children who are disproportionately affected by STH-associated morbidity. However, this strategy leaves many adults untreated and reinfection within communities perpetuates transmission even when mass drug administration (MDA) coverage of children is high. Evidence suggests that it may be possible to interrupt STH transmission by expanding MDA to a community-wide MDA (cMDA). Methods: This multi-methods study of organizational readiness survey, key informant interviews, and program mapping, were conducted with government stakeholders in three Indian states, Goa, Sikkim, and Odisha, to assess readiness of the states for transitioning from school-based MDA to cMDA and identify opportunities to leverage existing infrastructure from other NTD programs like lymphatic filariasis (LF) for STH cMDA. Principal findings: Overall, all three states indicated a highly favorable policy environment, effective leadership structure, adequate material resources, demonstrated technical capacity, and adequate community infrastructure needed to launch a STH cMDA program. The findings indicated a high-level of health system readiness to implement provided human resources and financial resources to deliver cMDA is strengthened. Areas with a significant overlap between LF and STH MDA platforms, particularly at the community-level, may be best primed for transitioning. Immunization, maternal child health, and non-communicable disease control programs were the other programs for possible integration of cMDA. States indicated having effective leadership structures in place at the state-level, however, engaging local leaders and community groups were considered crucial for successful implementation of cMDA. In-migration was a perceived challenge for estimating drug requirement and preventing possible stockouts. Conclusions: Findings from this study are intended to proactively support government decision making, prioritization, and program planning across heterogenous implementation contexts in India to speed the translation of research findings into practice.

Contextual determinants of mass drug administration performance: Modelling fourteen years of lymphatic filariasis treatments in West Africa.

Fuller BB, Harris V, Parker C, Martinez A, Toubali E, Ebene BC, Asemanyi-Mensah K, Dembele M, Salissou AB, Kabré C, Meite A, Kane NM, Kargbo-Labour I, Batcho W, Diaby A, Yevstigneyeva V, Stukel DM.
24-02-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36827450/

Mycétome

Actinomycetoma by Cellulosimicrobium cellulans in a Young Man from Guinea-Bissau: Short Literature Review Regarding a Case Report.

Trindade Torres M, Sousa Nunes B, Varandas L, Maltez F.
15-03-2023
Acta Med Port.
https://pubmed.ncbi.nlm.nih.gov/36919988/

Onchocercose

Ivermectin treatment response in two rural villages with a high prevalence of onchocerciasis and epilepsy, Mahenge Tanzania.

Bhwana D, Mmbando BP, Dusabimana A, Mhina A, Challe DP, Fodjo JNS, Makunde WH, Colebunders R.
Sep-2022
Afr Health Sci.
https://pubmed.ncbi.nlm.nih.gov/36910370/

Background: Despite 20 years of ivermectin mass distribution in the Mahenge area, Tanzania, the prevalence of onchocerciasis and epilepsy has remained high in rural villages. Objectives: We investigated the efficacy of ivermectin in reducing Onchocerca volvulus microfilariae and predictors for parasitic load following ivermectin treatment in persons with (PWE) and without epilepsy (PWOE). Methods: Between April and September 2019, 50 PWE and 160 randomly selected PWOE from Msogezi and Mdindo villages participated in a follow-up study. Skin snips were obtained pre (baseline) and three months post-ivermectin treatment. Results: The overall prevalence of *O. volvulus* positive skin snips at baseline was 49% (103/210), with no significant difference between PWE (58.0%) and PWOE (46.3%); p=0.197. The overall mean microfilarial density was significantly higher at baseline 1.45(95%CI:0.98-2.04)) than three-month post-ivermectin treatment (0.23(95%CI:0.11-0.37), p<0.001. Three months after ivermectin, the microfilarial density had decreased by ≥80% in 54 (81.8%, 95%CI: 72.3-91.4) of the 66 individuals with positive skin snips at baseline. High microfilarial density at baseline was the only significant predictor associated with higher microfilarial density in the post-ivermectin skin snips. Conclusion: Our study reports a decrease in microfilarial density following ivermectin treatment in most individuals. Optimizing ivermectin coverage will address the ongoing onchocerciasis transmission in Mahenge.

Cutaneous filarioid nematodes of dogs in the United States: Are they emerging, neglected, or underdiagnosed parasites?

Gruntmeir J, Kelly M, Ramos RAN, Verocai GG.
23-02-2023
Front Vet Sci.
https://pubmed.ncbi.nlm.nih.gov/36908516/

Filarioid nematodes, which are vector-borne parasites of cosmopolitan distribution, of dogs are medically important. They are represented by species in which microfilariae were found to be circulating in the bloodstream (e.g., *Dirofilaria* sp., *Acanthocheilonema* sp., and *Brugia* sp.) or skin-dwelling (e.g., *Cercopithifilaria* sp. and *Onchocerca* sp.). Those species whose microfilariae are detected in blood have been extensively studied, especially *Dirofilaria immitis*, due to their clinical importance. In recent decades, there has been an increased interest by the scientific community in filarioid nematodes whose microfilariae are detected in the skin because of the zoonotic aspect of *Onchocerca lupi*. In the United States (US), although *D. immitis* has been considered the main filarioid infecting dogs, the intense animal movement and global canine filarioid diversity may indicate that the likely presence of cutaneous filarioid nematodes is more common than previously expected. Hence, a question remains: Are these canine filarioid nematodes emerging, neglected, or simply underdiagnosed in the US? In this review, we provide an overview of pertinent information that briefly summarizes the biology of the different canine filarioid nematode species, clinical signs associated with infections, and currently available diagnostic tools using molecular and microscopy-based methods and highlight knowledge gaps where research and surveillance efforts remain necessary. The data herein presented serve as an alert to the scientific community about the importance of filarioid nematodes infecting dogs other than *D. immitis*. Additionally, the zoonotic potential of several filarioid species reinforces the necessity of a proper diagnosis and the need for broader surveillance to understand their diversity and distribution, to highlight the potential introduction of certain species, and mitigate their establishment in the country and new animal and human cases.

Development and validation of small animal models for onchocerciasis and loiasis microfilaricide discovery.

Ayiseh RB, Mbah GE, Monya E, Ndi EM, Sakanari J, Lustigman S, Cho-Ngwa F.
24-02-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36827447/

Schistosomiase

Unisexual infection with Schistosoma mansoni in mice has the potential to boost the immune response against eggs after challenge infection.

Reinholdt C, Winkelmann F, Koslowski N, Reisinger EC, Sombetzki M.
24-02-2023
Front Immunol.
https://pubmed.ncbi.nlm.nih.gov/36923416/

Introduction: The complexity of the *Schistosoma* spp. life cycle and their effective immune evasion strategies, makes vaccine development challenging. Unisexual infection models, that excludes any immunomodulatory effects of the parasite eggs, may contribute to a better understanding of complex immunological processes and identification of new targets for vaccine research. We have recently shown that long-term unisexual infection with schistosomes in mice results in an unpolarized Th1/Th2 response associated with an abnormally enlarged spleen and diffuse liver inflammation. Herein, we investigated whether (i) unisexual worms can mate after three months of single sex infection and (ii) thus the Th2 response induced by oviposition can reverse or heal the described systemic inflammation. Methods: Therefore, we infected 6-8 weeks old female C57BL/6j mice with 100 male or female cercariae and reinfected with the opposite sex for the same period after 12 weeks. At 24 weeks after initial infection, we histologically examined worm mating, as evidenced by the presence of parasite eggs, infection-related pathology associated with eggs, and characterization of fibrosis in the livers. Results: Single worms are able to mate months after unisexual infection and start oviposition. Egg deposition has been associated

with a typical Th2 immune response in the liver after unisexual reinfection, accompanied by increased recruitment of CD4+ T cells. Hepatic collagen levels were significantly increased in the reinfected groups compared to the naive and unisexually infected group. **Discussion:** Our results indicate that the eggs are able to restore the Th1/Th2 immune balance of a previous unisexual infection. However, the organ damage caused by the unisexual worms does not subside, but rather provides the baseline for the emerging egg-triggered inflammation and fibrosis. Since single schistosomes can mate even several weeks after unisexual infection and then accumulate worm- and egg-related organ damage, infection status without positive egg detection is very important, especially in areas with low prevalence.

Increased hepatic interleukin-1, arachidonic acid, and reactive oxygen species mediate the protective potential of peptides shared by gut cysteine peptidases against Schistosoma mansoni infection in mice.

Tallima H, El Ridi R.
15-03-2023
PLoS Negl Trop Dis.
https://pubmed.ncbi.nlm.nih.gov/36920999/

Background: Multiple antigen peptide (MAP) construct of peptide with high homology to Schistosoma mansoni cathepsin B1, MAP-1, and to cathepsins of the L family, MAP-2, consistently induced significant ($P < 0.05$) reduction in challenge S. mansoni worm burden. It was, however, necessary to modify the vaccine formula to counteract the MAP impact on the parasite egg counts and vitality, and discover the mechanisms underlying the vaccine protective potential. **Methodology:** Outbred mice were immunized with MAP-2 in combination with alum and/or MAP-1. Challenge infection was performed three weeks (wks) after the second injection. Blood and liver pieces were obtained on an individual mouse basis, 23 days post-infection (PI), a time of S. mansoni development and feeding in the liver before mating. Serum samples were examined for the levels of circulating antibodies and cytokines. Liver homogenates were used for assessment of liver cytokines, uric acid, arachidonic acid (ARA), and reactive oxygen species (ROS) content. Parasitological parameters were evaluated 7 wks PI. **Principal findings:** Immunization of outbred mice with MAP-2 in combination with alum and/or MAP-1 elicited highly significant ($P < 0.005$) reduction of around 60% in challenge S. mansoni worm burden and no increase in worm eggs' loads or vitality, compared to unimmunized or alum pre-treated control mice. Host memory responses to the immunogens are expected to be expressed in the liver stage when worm feeding and cysteine peptidases release start to be active. Serum antibody and cytokine levels were not significantly different between control and vaccinated mouse groups. Highly significant ($P < 0.05$ - <0.0001) increase in liver interleukin-1, ARA, and ROS content was recorded in MAP-immunized compared to control mice. **Conclusion/significance:** The findings provided an explanation for the gut cysteine peptidases vaccine-mediated reduction in challenge worm burden and increase in egg counts.

Evolution of tetraspanin antigens in the zoonotic Asian blood fluke Schistosoma japonicum.

Parsons DAJ, Walker AJ, Emery AM, Webster JP, Lawton SP.
14-03-2023
Parasit Vectors.
https://pubmed.ncbi.nlm.nih.gov/36918965/

Differentiation between Bulinus truncatus and Bulinus hexaploidus by morphological characters, chromosomal study and compatibility with Schistosoma haematobium.

Mansour SM, Ibrahim AM.
11-03-2023
Exp Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36914064/

Schistosomiasis is a snail-born, neglected tropical disease (NTD) caused by blood flukes (trematode worms) of the genusSchistosoma. It is the second most socioeconomically devastating parasitic disease after malaria. Urogenital schistosomiasis is caused by Schistosoma haematobium which is transmitted by snail intermediate host of the genus Bulinus. This genus is a model system for the study of polyploidy in animals. This study aims to investigate ploidy levels existing among the Bulinus species and their compatibility with S. haematobium. The specimens were collected from two governorates in Egypt. Chromosomal preparation was made from gonad tissue (ovotestis). This study found two ploidy levels (tetraploid, n = 36 and hexaploid, n = 54) of B. truncatus/tropicus complex in Egypt. Tetraploid B. truncatus was found in El-Beheira governorate while-unexpectedly and for the first time in Egypt, the hexaploid population was found in Giza governorate. This identification focused on shell morphology, chromosomal count, and spermatozoa of each species. Afterward, all species were exposed to S. haematobium miracidia where B. hexaploidus snails were the only refractory species. The histopathological study showed early destruction and abnormal development of S. haematobium in B. hexaploidus tissues. In addition, the hematological investigation showed increasing in the total hemocyte count, the formation of vacuoles, several pseudopodia, and more dense granules in the hemocytes of infected B. hexaploidus snails. In conclusion, there were two types of snails one was refractory and the other was susceptible.

Functional characterization of differentially expressed proteins coming from unisexual and bisexual infected Schistosoma japonicum female worms.

Zhong H, Qin F, Ren Y, Li X, Hou L, Gu S, Jin Y.
11-03-2023
Exp Parasitol.
https://pubmed.ncbi.nlm.nih.gov/36914063/

Parasitic infections as potential risk factors for attention deficit hyperactivity disorder (ADHD) in children.

Elmehy DA, Elmansory BM, Gamea GA, Abdelhai DI, Abd-Elsalam SM, Salamah AM, Ata DS, Mahmoud EF, Ibrahim HA, Salama AM.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910322/

Community burden of intestinal parasites and its public health concerns in Obizi, Amakama Olokoro, Umuahia South, Abia State, Nigeria.

Okosa C, Ukpai OM, Lawrence QO.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910319/

Intestinal parasitic infections are the leading cause of morbidity and mortality in sub-Saharan Africa. This could be due to the dominance of factors such as poverty, poor hygiene, and the absence of basic infrastructures. The migration of people from parasite endemic regions due to insecurity has caused public health concerns. This study was conducted to ascertain the community burden of intestinal parasitic infections in a rural community South-east Nigeria. Formol-ether concentration technique was used in analyzing feacal samples, data analysis involved frequency and distribution statistics, the PAST statistical software was used to determine statistical significance. Results from the study showed that out of 284 respondents 96 (33.8%) were infected. Parasites observed were *Ascaris lumbricoides* (15.5%), Hookworm (3.9%), *Taenia saginata* (3.5%), *Schistosoma mansoni* (4.2%), *Enterobius vermicularis* (1.1%), *Trichuris trichura* (1.4%), *Chilomastix mensnili* (1.8%), *Balatidium coli* (1.1%), *Fasciola hepatica* (0.7%) and *Entamoeba coli* (0.7%). Mixed infections occurred. The combination of Hookworm and *Taenia saginata* occurred the most (1.8%). Females had the highest rate of infection (40.3%), also the age group (11-20) years (92.9%). Students had the highest prevalence (50.9%). Fever, Fatigue, blood in stool, and diarrhoea were the signs/symptoms of ill health reported. This study has revealed a community burden of intestinal parasites, which is of great public health concern. Public enlightenment and deworming through mass drug administration are recommended.

Schistosoma mansoni coactivator associated arginine methyltransferase 1 (SmCARM1) effect on parasite reproduction.

Coelho FS, Gava SG, Andrade LF, Geraldo JA, Tavares NC, Lunkes FMN, Neves RH, Machado-Silva JR, Pierce RJ, Oliveira G, Mourão MM.
24-02-2023
Front Microbiol.
https://pubmed.ncbi.nlm.nih.gov/36910171/

Introduction: The human blood fluke parasite *Schistosoma mansoni* relies on diverse mechanisms to adapt to its diverse environments and hosts. Epigenetic mechanisms play a central role in gene expression regulation, culminating in such adaptations. Protein arginine methyltransferases (PRMTs) promote posttranslational modifications, modulating the function of histones and non-histone targets. The coactivator-associated arginine methyltransferase 1 (CARM1/PRMT4) is one of the *S. mansoni* proteins with the PRMT core domain. Methods: We carried out *in silico* analyses to verify the expression of SmPRMTs in public datasets from different infection stages, single-sex versus mixed-worms, and cell types. The SmCARM1 function was evaluated by RNA interference. Gene expression levels were assessed, and phenotypic alterations were analyzed *in vitro*, *in vivo*, and *ex vivo*. Results: The scRNAseq data showed that SmPRMTs expression is not enriched in any cell cluster in adult worms or schistosomula, except for Sm*carm*1 expression which is enriched in clusters of ambiguous cells and Sm*prmt*1 in NDF+ neurons and stem/germinal cells from schistosomula. Sm*prmt*1 is also enriched in S1 and late female germ cells from adult worms. After dsRNA exposure *in vitro*, we observed a Sm*carm*1 knockdown in schistosomula and adult worms, 83 and 69%, respectively. Sm*carm*1-knockdown resulted in reduced oviposition and no significant changes in the schistosomula or adult worm phenotypes. *In vivo* analysis after murine infection with Sm*carm*1 knocked-down schistosomula, showed no significant change in the number of worms recovered from mice, however, a significant reduction in the number of eggs recovered was detected. The *ex vivo* worms presented a significant decrease in the ovary area with a lower degree of cell differentiation, vitelline glands cell disorganization, and a decrease in the testicular lobe area. The worm tegument presented a lower number of tubercles, and the ventral sucker of the parasites presented a damaged tegument and points of detachment from the parasite body. Discussion: This work brings the first functional characterization of SmCARM1 shedding light on its roles in *S. mansoni* biology and its potential as a drug target. Additional studies are necessary to investigate whether the reported effects of Sm*carm*1 knockdown are a consequence of the SmCARM1-mediated methylation of histone tails involved in DNA packaging or other non-histone proteins.

Single-cell analysis of CX3CR1 $^{+}$ cells reveal a pathogenic role for BIRC5 $^{+}$ myeloid proliferating cells driven by Staphylococcus aureus leukotoxins.

Loredan DG, Devlin JC, Lacey KA, Howard N, Chen Z, Zwack EE, Lin JD, Ruggles KV, Khanna KM, Torres VJ, Loke PN.
27-02-2023
bioRxiv.
https://pubmed.ncbi.nlm.nih.gov/36909517/

Our previous studies identified a population of stem cell-like proliferating myeloid cells within inflamed tissues that could serve as a reservoir for tissue macrophages to adopt different activation states depending on the microenvironment. By lineage tracing cells derived from CX3CR1 $^{+}$ precursors in mice during infection and profiling by scRNA-seq, here we identify a cluster of BIRC5 $^{+}$ myeloid

cells that expanded in the liver during either chronic infection with the parasite *Schistosoma mansoni* or the bacterial pathogen *Staphylococcus aureus* . In the absence of tissue damaging toxins, *S. aureus* infection does not elicit these BIRC5 $^{+}$ cells. Moreover, deletion of BIRC5 from CX3CR1 expressing cells results in improved survival during *S. aureus* infection. Hence, the combination of scRNA-Seq and genetic fate mapping CX3CR1 $^{+}$ cells revealed a toxin dependent pathogenic role for BIRC5 in myeloid cells during *S. aureus* infection.

Prevalence and Clinical Relevance of Schistosoma mansoni Co-Infection with Mycobacterium tuberculosis: A Systematic Literature Review.

Baya B, Kone B, Somboro A, Kodio O, Somboro AM, Diarra B, Traore FG, Kone D, Traore MA, Kone M, Togo AG, Sarro YS, Maiga A, Maiga M, Toloba Y, Diallo S, Murphy RL, Doumbia S.
Feb-2023
Open J Epidemiol.
https://pubmed.ncbi.nlm.nih.gov/36910425/

Molluskicidal nanoemulsion of Neomitranthes obscura (DC.) N. Silveira for schistosomiasis control.

Rangel LDS, Paiva Machado F, Amaral R, Cláudia Rodrigues Da Silva A, Santos MG, Albuquerque Dos Santos JA, Lidmar Von Ranke N, Rodrigues CR, Rocha L, Faria RX.
24-02-2023
Front Pharmacol.
https://pubmed.ncbi.nlm.nih.gov/36909200/

Systematic review of applied mathematical models for the control of Schistosoma japonicum.

Lowe C, Ahmadabadi Z, Gray D, Kelly M, McManus DP, Williams G.
11-03-2023
Acta Trop.
https://pubmed.ncbi.nlm.nih.gov/36907291/

Background: Schistosoma japonicum remains endemic in China and the Philippines. Substantial progress has been made in the control of Japonicum in both China and the Philippines. China is reaching elimination thanks to a concerted effort of control strategies. Mathematical modelling has been a key tool in the design of control strategies, in place of expensive randomised-controlled trials. We conducted a systematic review to investigate mathematical models of Japonicum control strategies in China and the Philippines. Methods: We conducted a systematic review on July 5, 2020, in four electronic bibliographic databases - PubMed, Web of Science, SCOPUS and Embase. Articles were screened for relevance and for meeting the inclusion criteria. Data extracted included authors, year of publication, year of data collection, setting and ecological context, objectives, control strategies, main findings, the form and content of the model including its background, type, representation of population dynamics, heterogeneity of hosts, simulation period, source of parameters, model validation and sensitivity analysis. Results After screening, 19 eligible papers were included in the systematic review. Seventeen considered control strategies in China and two in the Philippines. Two frameworks were identified; the mean-worm burden framework and the prevalence-based framework, the latter of which increasingly common. Most models considered human and bovine definitive hosts. There were mixed additional elements included in the models, such as alternative definitive hosts and the role of seasonality and weather. Models generally agreed upon the need for an integrated control strategy rather than reliance on mass drug administration alone to sustain reductions in prevalence. Conclusions: Mathematical modelling of Japonicum has converged from multiple approaches to modelling using the prevalence-based framework with human and bovine definitive hosts and find integrated control strategies to be most effective. Further research could investigate the role of other definitive hosts and model the effect of seasonal fluctuations in transmission.

Rutin, a Flavonoid Compound Derived from Garlic, as a Potential Immunomodulatory and Anti-Inflammatory Agent against Murine Schistosomiasis mansoni.

Hamad RS.
28-02-2023
Nutrients.
https://pubmed.ncbi.nlm.nih.gov/36904204/

Status Quo and Future Perspectives of Molecular and Genomic Studies on the Genus Biomphalaria-The Intermediate Snail Host of Schistosoma mansoni.

Au MFF, Williams GA, Hui JHL.
03-03-2023
Int J Mol Sci.
https://pubmed.ncbi.nlm.nih.gov/36902324/

Schistosomiasis, or also generally known as bilharzia or snail fever, is a parasitic disease that is caused by trematode flatworms of the genus *Schistosoma*. It is considered by the World Health Organisation as the second most prevalent parasitic disease after malaria and affects more than 230 million people in over 70 countries. People are infected via a variety of activities ranging from agricultural, domestic, occupational to recreational activities, where the freshwater snails *Biomphalaria* release *Schistosoma* cercariae larvae that penetrate the skin of humans when exposed in water. Understanding the biology of the intermediate host snail *Biomphalaria* is thus important to reveal the potential spread of schistosomiasis. In this article, we present an overview of the latest molecular studies focused on the snail *Biomphalaria*, including its ecology, evolution, and immune response; and propose using genomics as a foundation to further understand and control this disease vector and thus the transmission of schistosomiasis.

In Vitro and In Vivo Antischistosomal Activity Profiling and Pharmacokinetics of Ozonide Carboxylic Acids.

Biendl S, Häberli C, Chen G, Wang W, Zhong L, Saunders J, Pham T, Wang X, Wu J, Charman SA, Vennerstrom JL, Keiser J.
10-03-2023
ACS Infect Dis.
https://pubmed.ncbi.nlm.nih.gov/36794836/

Preparation of polyclonal anti-Schistosoma mansoni cysteine protease antibodies for early diagnosis.

Farid A.
Mar-2023
Appl Microbiol Biotechnol.
https://pubmed.ncbi.nlm.nih.gov/36773062/

Mansonic neuroschistosomiasis in the childhood: an undiagnosed pathology?

Dastoli PA, da Costa MDS, Nicácio JM, Pinho RS, Ferrarini MAG, Cavalheiro S.
Feb-2023
Childs Nerv Syst.
https://pubmed.ncbi.nlm.nih.gov/36258049/

Helminthiases transmises par le sol (ascaridiose, trichuriase, ankylostomiase)

Small bowel obstruction caused by massive ascariasis: two case reports.

Ali AY, Mohamed Abdi A, Mambet E.
06-02-2023
Ann Med Surg (Lond).
https://pubmed.ncbi.nlm.nih.gov/36923774/

Community burden of intestinal parasites and its public health concerns in Obizi, Amakama Olokoro, Umuahia South, Abia State, Nigeria.

Okosa C, Ukpai OM, Lawrence QO.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910319/

Intestinal parasitic infections are the leading cause of morbidity and mortality in sub-Saharan Africa. This could be due to the dominance of factors such as poverty, poor hygiene, and the absence of basic infrastructures. The migration of people from parasite endemic regions due to insecurity has caused public health concerns. This study was conducted to ascertain the community burden of intestinal parasitic infections in a rural community South-east Nigeria. Formol-ether concentration technique was used in analyzing feacal samples, data analysis involved frequency and distribution statistics, the PAST statistical software was used to determine statistical significance. Results from the study showed that out of 284 respondents 96 (33.8%) were infected. Parasites observed were *Ascaris lumbricoides* (15.5%), Hookworm (3.9%), *Taenia saginata* (3.5%), *Schistosoma mansoni* (4.2%), *Enterobius vermicularis* (1.1%), *Trichuris trichura* (1.4%), *Chilomastix mensnili* (1.8%), *Balatidium coli* (1.1%), *Fasciola hepatica* (0.7%) and *Entamoeba coli* (0.7%). Mixed infections occurred. The combination of Hookworm and *Taenia saginata* occurred the most (1.8%). Females had the highest rate of infection (40.3%), also the age group (11-20) years (92.9%). Students had the highest prevalence (50.9%). Fever, Fatigue, blood in stool, and diarrhoea were the signs/symptoms of ill health reported. This study has revealed a community burden of intestinal parasites, which is of great public health concern. Public enlightenment and deworming through mass drug administration are recommended.

Comparative efficacy of ivermectin and fenbendazole against ancylostomiasis in dogs.

Bhanjadeo R, Patra RC, Panda D, Sahoo R, Das DP, Mohanty BN.
Mar-2023
J Parasit Dis.
https://pubmed.ncbi.nlm.nih.gov/36910310/

Impact of helminthiasis on gestational anemia in low- and middle-income countries: a systematic review and meta-analysis of more than 19,000 women.

Alvarado-Gonzalez JC, Alvis-Zakzuk NR, Castillo-Saavedra DE, Lozada-Martinez ID, Picón-Jaimes YA, Narvaez-Rojas AR, Zakzuk J.
01-03-2023
Infez Med.
https://pubmed.ncbi.nlm.nih.gov/36908393/

Intestinal helminthiasis are a common public health problem in developed and developing countries. It is thought that they can influence pregnancy by causing gestational anemia. The aim of this study was to determine if there is a relationship between helminth infection and gestational anemia. A structured review of scientific literature was conducted through active search in the electronic databases MEDLINE® and LILACS® until December 2021, following 2020 PRISMA statement. The studies were reviewed independently by two authors, extracting the most relevant information from each study. Cross-sectional studies, case-control and ecological studies were included, with no date or language limit. Randomized clinical trials were excluded. A total of 38 studies were included in the systematic review. The study populations of all studies belonged to low- and middle-income countries: 28 studies from Africa, 6 from Asia, 3 from Latin America and 1 from Oceania. Overall, the average prevalence of gestational anemia among the included studies was 40% (95% CI 34-46%). Hookworm was the predominant species detected in most studies (19/38; 50%), followed by *Ascaris lumbricoides* (15/38; 39.5%). Gestational anemia was positively associated with

A. lumbricoides (OR 1.86, 95% CI 1.12-3.08) and hookworms (OR 3.09, 95% CI 1.99-4.78). Prevalence of malaria was not associated with the magnitude of the effect of hookworm on anemia risk during meta-regression (p=0.5182). The results of this review indicate that there is a statistically significant association between helminthiasis and gestational anemia. Although hookworm is the main species associated with the outcome, prevalence of malaria was not associated with the magnitude of the effect of hookworm on anemia risk. The impact of other species needs to be defined given the expected bias that arises from polyparasitism when defining comparison groups.

Soil-transmitted helminth infection among school-age children in Ogoja, Nigeria: implication for control.

Imalele EE, Braide EI, Emanghe UE, Effanga EO, Usang AU.
Apr-2023
Parasitol Res.
https://pubmed.ncbi.nlm.nih.gov/36882536/

The study aimed at assessing the prevalence and risk factors of soil-transmitted helminthiases among school-aged children in Ogoja Local Government Area, Cross River State. Fecal samples were collected from 504 participants and analyzed using the Kato-Katz technique and modified Baermann technique for identifying larvae of Strongyloides. A total of 232 (46.0%) samples were positive for soil-transmitted helminths. The overall prevalence of Ascaris lumbricoides, hookworm, Trichuris trichiura, and Strongyloides stercoralis were 14.1%, 16.5%, 2.6%, and 12.9% respectively. The prevalence of infections were higher among males (46.6%) than females (45.4%). Overall, parasitic infection was higher in the 5-7-year age group (65.6%) than in the other age groups (p = 0.000). Infection intensities of A. lumbricoides (84.00 EPG) (p = 0.044) and T. trichiura (96.00 EPG) (p = 0.041) were higher in school-age children aged 14-16 years. A. lumbricoides and hookworm co-infection (8.7%) was the most common mixed infection and was significantly higher in males than females. School-aged children who did not have prior knowledge about soil-transmitted helminth infections, the habit of drinking water without boiling, open defecation, use of pit latrine, and children who did not have toilet facilities in school were significantly associated with soil-transmitted helminthiases. There was a significant relationship between washing hands after using the toilet, the habit of putting on footwear outside the house, and soil-transmitted helminth infection. In addition to preventive chemotherapy, control measures should focus on health education, providing clean drinking water, proper disposal of human excreta and sewage, and environmental hygiene.

Molecular evidence of widespread benzimidazole drug resistance in Ancylostoma caninum from domestic dogs throughout the USA and discovery of a novel β-tubulin benzimidazole resistance mutation.

Venkatesan A, Jimenez Castro PD, Morosetti A, Horvath H, Chen R, Redman E, Dunn K, Collins JB, Fraser JS, Andersen EC, Kaplan RM, Gilleard JS.
02-03-2023
PLoS Pathog.
https://pubmed.ncbi.nlm.nih.gov/36862759/

Gale

Pharmacokinetic and pharmacodynamic considerations for treating sarcoptic mange with cross-relevance to Australian wildlife.

Takano K, de Hayr L, Carver S, Harvey RJ, Mounsey KE.
05-03-2023
Int J Parasitol Drugs Drug Resist.
https://pubmed.ncbi.nlm.nih.gov/36906936/

Sarcoptes scabiei is the microscopic burrowing mite responsible for sarcoptic mange, which is reported in approximately 150 mammalian species. In Australia, sarcoptic mange affects a number of native and introduced wildlife species, is particularly severe in bare-nosed wombats (Vombatus ursinus) and an emerging issue in koala and quenda. There are a variety of acaricides available for the treatment of sarcoptic mange which are generally effective in eliminating mites from humans and animals in captivity. In wild populations, effective treatment is challenging, and concerns exist regarding safety, efficacy and the potential emergence of acaricide resistance. There are risks where acaricides are used intensively or inadequately, which could adversely affect treatment success rates as well as animal welfare. While reviews on epidemiology, treatment strategies, and pathogenesis of sarcoptic mange in wildlife are available, there is currently no review evaluating the use of specific acaricides in the context of their pharmacokinetic and pharmacodynamic properties, and subsequent likelihood of emerging drug resistance, particularly for Australian wildlife. This review critically evaluates acaricides that have been utilised to treat sarcoptic mange in wildlife, including dosage forms and routes, pharmacokinetics, mode of action and efficacy. We also highlight the reports of resistance of S. scabiei to acaricides, including clinical and in vitro observations.

Dermoscopic features of children scabies.

Nie YL, Yi H, Xie XY, Fu GL, Zheng YQ.
21-03-2023
Front Med (Lausanne).
https://pubmed.ncbi.nlm.nih.gov/36895725/

Scabies is a common skin disorder, caused by the ectoparasite *Sarcoptes scabiei*. The scabies mites burrow is highly diagnostic but illegible by the naked eye, because it is tiny and may completely be obscured by scratch and crust. The classic technique is opening the end of an intact mite burrow with a sharp instrument and inspecting its contents in the light microscope under loupe vision. Dermatoscope is a new method to diagnose scabies, with the advantages of non-invasive and more sensitive. This

study verified the characteristic manifestations of scabies under dermoscopy. Under the closer examination of the curvilinear scaly burrow, the scabies mite itself may be seen as a dark equilateral triangular structure, which is often referred to as a "jet with contrail." Besides, this study found that the positive detection rate of microscopic characteristic manifestations under the dermoscopy ordered by the external genitals, the finger seams and the trunk, which were statistically different (*P*-value < 0.05). Of note, this is the first study to explore the regional distribution of the characteristic dermoscopic manifestations of scabies. We are the first to propose to focus on examining the external genitalia and finger seams with dermoscopy.

Patient Care and Treatment Strategies for Skin Diseases in Sub-Saharan Africa: Role of Traditional and Western Medicines.

Sharma A, Sundaram S, Malviya R, Verma S, Fuloria NK, Fuloria S, Sekar M, Mishra N, Meenakshi DU.
2023
Infect Disord Drug Targets.
https://pubmed.ncbi.nlm.nih.gov/36121085/

The perspective of the people of Sub-Saharan Africa (SSA) toward both traditional and western healthcare systems varies. The goal of the current study is to examine the SSA's unique skin disease health care system. This study comprises numerous research that sought to examine how the general public feels about the SSA's current healthcare system. In this review, common skin conditions, such as atopic dermatitis, buruli ulcers, dermatophytosis, and scabies, are addressed. According to this report, government agencies must pay particular attention to skin illnesses in SSA and raise public awareness. Availability of medical care, socioeconomic factors, degree of education, and other factors influence patients' attitudes toward traditional and western health care differently in different geographic areas. Facts suggest that self-medication is the preference of the majority of patients before seeking dermatological care. The present study concludes that the magnitude of skin diseases is neglected or underestimated in many regions of SSA. Also, western healthcare facilities of many regions of SSA are not up to the mark. The present study recommends that proper access to the health care system and awareness about skin diseases through various government programs can be helpful in the regulation of skin disorders among people of SSA.

Morsures de serpent

Captive Black Mamba (Dendroaspis Polylepis) Bite Leading to Respiratory Failure.

Greene SC, Cue K, Khan R, Gilbert MB, Rahimi J.
14-03-2023
J Emerg Med.
https://pubmed.ncbi.nlm.nih.gov/36925444/

Background: Of the 8000-10,000 snake envenomations evaluated in U.S. emergency departments (ED) annually, approximately 1% are due to non-native snakes. We describe a 26-year-old man who was bitten by his captive black mamba (Dendroaspis polylepis) as he was packing it up for transport to another snake collector. **Case report:** The patient presented to the ED 1 h after being bitten on the forearm, complaining of left arm pain, oral paresthesias, and dyspnea. His vital signs: heart rate 96 beats/min, blood pressure 167/101 mm Hg, temperature 36.7°C (97.9°F), respiratory rate 20 breaths/min, and room air oxygen saturation 100%. Two mildly tender puncture wounds without swelling or ecchymosis were found on the posterior aspect of the forearm. Over the ensuing 30 min his dyspnea worsened, and he developed objective weakness. He was intubated and placed on mechanical ventilation. He was treated with atropine 2 mg for bronchorrhea. Five vials of South African Vaccine Producers (Johannesburg, South Africa) polyvalent antivenom were administered 2.5 h post-bite and the patient was admitted to the intensive care unit. He was extubated 18 h post-envenomation and discharged the following day. He has remained asymptomatic since leaving the hospital. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: The primary manifestations of D. polylepis envenomings are neurological. Initial signs may include paresthesias, dysarthria, dysphagia, and ptosis. Progressive descending paralysis leading to respiratory failure develops within 60 min. Muscarinic features are frequently observed. Cardiotoxicity and hematologic laboratory abnormalities may be present. Although pain is common, significant local tissue injury does not occur. In addition to supportive care, several non-native antivenoms are indicated for D. polylepis envenomations. Black mamba envenomings differ from the native snakebites with which U.S. physicians are familiar. Rapid, progressive neurological toxicity and muscarinic features are most common. Treatment consists of supportive care and appropriate antivenom administration.

Alarmins and inflammatory aspects related to snakebite envenomation.

Zuliani JP.
14-03-2023
Toxicon.
https://pubmed.ncbi.nlm.nih.gov/36924999/

Rapid identification of bilateral adrenal and pituitary haemorrhages induced by Russell's viper envenomation results in positive patient outcome.

Senthilkumaran S, Almeida JR, Williams J, Williams HF, Thirumalaikolundusubramanian P, Patel K, Vaiyapuri S.
15-03-2023
Toxicon.
https://pubmed.ncbi.nlm.nih.gov/36863530/

The clinical management of snakebite envenomation (SBE) is challenging in many tropical and subtropical regions of developing countries due to the complex clinical manifestations and inadequate medical infrastructure.

Some venomous snakes, such as the Indian Russell's viper (Daboia russelii) cause a wide range of rare complications in addition to their classical envenomation effects. In general, these uncommon complications are often misdiagnosed or not treated promptly due to a lack of awareness about these conditions. Thus, it is critical to report such complications to draw the attention of the healthcare and research communities to improve the clinical management and scientific research of SBE, respectively. Here, we report bilateral adrenal and pituitary haemorrhages in an SBE patient following a bite by Russell's viper in India. The initial symptoms included gum bleeding, swelling, axillary lymphadenopathy and clotting abnormalities. Despite the administration of antivenom, the patient presented palpitation, nausea, and abdominal pain, which were not recovered by combinational therapy with epinephrine and dexamethasone. Further infusion of antivenom did not address these issues and the patient displayed persistent hypotension, hypoglycaemia and hyperkalaemia suggesting an adrenal crisis. Inadequate secretion of corticosteroids was confirmed by laboratory tests, and imaging investigations revealed haemorrhages in both the adrenal and pituitary glands. The patient made a full recovery after treatment with hydrocortisone and thyroxine. This report adds to the growing evidence of rare complications induced by Russell's viper envenomations and it provides relevant guidance to diagnose and treat such complications in SBE victims.

Cat-eyed snake (Genus: Boiga) bites in Sri Lanka: First authentic case series.

Rathnayaka RMMKN, Ranathunga PEAN, Silva MLI, Abeyrathna YNMP, Kularatne SAM.
15-03-2023
Toxicon.
https://pubmed.ncbi.nlm.nih.gov/36791994/

Clinical effects of combined red and infrared wavelengths in the treatment of local injuries caused by Bothrops leucurus snake venom.

Dias da Silva G, da Paixão Sevá A, Lessa Silva F, Mota Sena de Oliveira G, Machado Deorce D, de Jesus da Costa Junior N, Alzamora Filho F.
15-03-2023
Toxicon.
https://pubmed.ncbi.nlm.nih.gov/36780992/

Aim: to evaluate the effects of visible and invisible wavelengths, individually and combined, on local edematogenic activity, serum and muscle enzymes, and clinical response in mice inoculated with B. leucurus snake venom. Methods: 112 male mice were inoculated with diluted B. leucurus snake venom in the right gastrocnemius muscle, the same volume of saline solution was applied in the contralateral muscle. The animals were divided into four groups, one control and three treated with: 1) red laser (λ = 660 nm), 2) infrared laser (λ = 808 nm) and 3) red laser (λ = 660 nm) + infrared (λ = 808 nm). Each group was subdivided into four subgroups, according to the duration of treatment application (applications every 24 h over evaluation times of up to 144 h). A diode laser was used (0.1 W, CW, 1J/point, DE: 10 J/cm^2). Results: the treatments prevented the loss of the proprioception reflex, accelerated the reestablishment of the damaged area, and reduced claudication, local hemorrhage, and edematogenic activity caused by bothropic venom. Both wavelengths reduced serum concentrations of creatine kinase (CK) and aspartate aminotransferase (AST) and increased muscle concentration of CK. The combined wavelengths caused a significant reduction in serum enzyme concentrations and a better clinical response when compared to the isolated treatments.Conclusion: Laser photobiomodulation proved to be effective in the treatment of the disorders evaluated and the interaction between red and infrared wavelengths potentiated the therapy effects.