VOLUME III / ISSUE 11

South African Immunology Society

NEWSLETTER

28 October 2022

Dear SAIS Members,

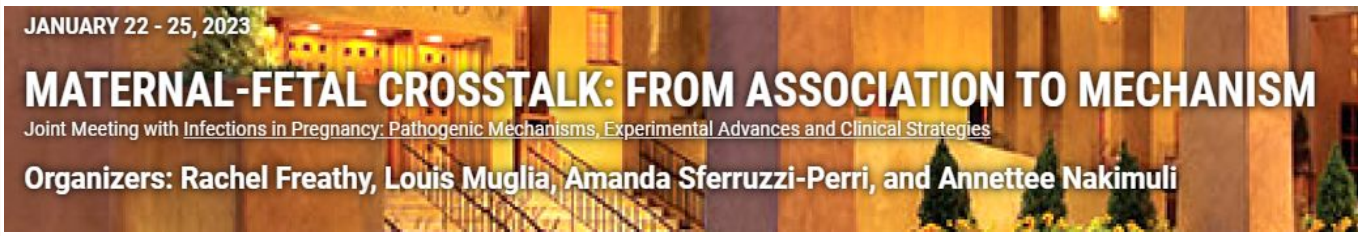
Welcome to the October Newsletter. Thank you to all those that attended the 9th SAIS conference. We hope it was an inspiring and enlightening experience. We have included memorable moments from the conference and we hope to see you all again at the next one! In this edition we also showcase our new and improved SAIS logo. We have altered our logo to reflect who we are today and to symbolise our dynamic future. Our logo is modern and has key elements that convey the mission of the society while remaining true to the longstanding reputation. Please visit our social media platforms for more daily updates, photos, and SAIS Breaking News.

FUNDING CALLS, CONFERENCES, WEBINARS & ANNOUNCEMENTS

South African Immunology Society presents *An African Based Immunology Seminar Series*
For more information, please visit: https://www.saimmunology.org.za/webinars.html

Save the Date!
18th International Congress of Immunology: **27 - 02 December 2023**

Upcoming Keystone Symposiums



For registration and other inquiries, please visit https://www.keystonesymposia.org/

Memorable Moments at the 9th SAIS Conference - 2022

Memorable Moments at the 9th SAIS Conference

PUBLICATIONS & INTERESTING READS

Analysis: Is SA on course to solve its TB diagnosis problem?
https://www.spotlightnsp.co.za/2022/03/24/analysis-is-sa-on-course-to-solve-its-tb-diagnosis-problem/

Biologics for allergic and immunologic diseases
https://www.jacionline.org/article/S0091-6749(22)01117-4/fulltext

CD19 CAR T cells for infants and young children
https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(22)00258-7/fulltext

Charting hematopoiesis in the single-cell omics era
https://www.jacionline.org/article/S0091-6749(22)01119-8/fulltext

Epigenetic analysis of cell-free DNA by fragmentomic profiling
https://www.pnas.org/doi/10.1073/pnas.2209852119

Evolution of immune genes is associated with the Black Death
https://www.nature.com/articles/s41586-022-05349-x

Genetic Study Suggests Causal Link for Vitamin D Deficiency, Mortality
https://www.practiceupdate.com/news/39801/2/20?elsca1=emc_enews_daily-digest&elsca2=email&elsca3=practiceupdate_rm&elsca4=respiratorymedicine&elsca5=newsletter&rid=NDY1Mzc5NzcwNTYyS0&lid=22920205

Revealing the heterogeneity of CD4+ T cells through single-cell transcriptomics
https://www.jacionline.org/article/S0091-6749(22)01118-6/fulltext

Sharing is caring? Skin microbiome insights into staphylococci in patients with atopic dermatitis and caregivers
https://www.jacionline.org/article/S0091-6749(22)00995-2/fulltext

Unraveling the Causes of the Pandemic, and Preparing for the Next
https://e360.yale.edu/features/david-quammen-covid-pandemic-origins-wildlife

Up-regulation of BTN3A1 on CD14+ cells promotes Vγ9Vδ2 T cell activation in psoriasis
https://www.pnas.org/doi/10.1073/pnas.2117523119

DISEASE OF THE MONTH: DIABETES

The role of the microbiome in diabetes mellitus
https://www.diabetesresearchclinicalpractice.com/article/S0168-8227(20)30902-5/fulltext

Type 2 Diabetes and its Impact on the Immune System
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7475801/?report=reader

How dysregulation of the immune system promotes diabetes mellitus and cardiovascular risk complications
https://www.frontiersin.org/articles/10.3389/fcvm.2022.991716/full

RESOURCES FOR IMMUNOLOGY LOVERS

https://www.faisafrica.com
https://immunopaedia.org
https://iuis.org
https://www.stemcell.com/

Socials to follow

@doctorsoumya
@T_Inglesby
@yunlong_cao

COMMUNITY CORNER

Showcasing the bright minds of SAIS

Low Immune Activation in Early Pregnancy Is Associated With Preterm But Not Small-for-gestational-age Delivery in Women Infected With Human Immunodeficiency Virus Initiating Antiretroviral Therapy in Pregnancy: A Prematurity Immunology in HIV-infected Mothers and their Infants Study (PIMS) Case-control Study in Cape Town, South Africa

Authors: Nontlantla Mdletshe, Christina Thobakgale, Thokozile R Malaba, Hlengiwe Madlala, Landon Myer, Daniel M Muema, Polycarp Mogeni, **Clive M Gray**, Marcus Altfeld, Marie-Louise Newell, **Thumbi Ndung'u**

Background: In this study, the authors discuss the mechanisms underlying the association between HIV or ART during pregnancy with risk of preterm delivery (PTD) or small-for-gestational-age (SGA) . They explored the association between cellular immune activation and PTD in women with HIV initiating ART during or before pregnancy.

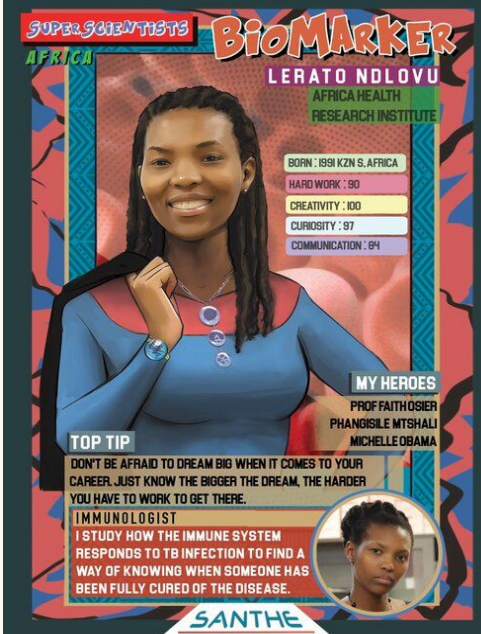
Methods: Women with HIV enrolled at median 15 weeks' gestation, were analyzed for immune markers, and matched on ART initiation timing (15 women initiated pre- and 15 during pregnancy). There were 30 PTD (delivery <37 weeks), 30 SGA (weight for age ≤10th percentile) cases, and 30 controls (term, weight for gestational age >25th percentile) as outcomes. Lymphocytes, monocytes, and dendritic cell populations and their activation status or functionality were enumerated by flow cytometry.

Results: PTD cases initiating ART in pregnancy showed decreased $CD8^+$ T cell, monocyte, and dendritic cell activation; increased classical ($CD14^+CD16^-$) and intermediate ($CD14^+CD16^+$) monocyte frequencies; and decreased inflammatory monocytes ($CD14^{dim}CD16^+$) compared with SGA cases and term controls (all $P < .05$). Allowing for baseline viral load, the immune markers remained significantly associated with PTD but only in women initiating ART in pregnancy. Lower monocyte activation was predictive of PTD. TLR ligand-induced interferon-α and macrophage inflammatory protein-1β levels in monocytes were significantly lower in PTD women initiating ART in pregnancy.

Conclusion: Low immune activation, skewing toward anti-inflammatory monocytes, and lower monocyte cytokine production in response to TLR ligand stimulation were associated with PTD but not SGA among women initiating ART in, but not before, pregnancy, suggesting immune anergy to microbial stimulation as a possible underlying mechanism for PTD in women initiating ART in pregnancy.

SUPERSCIENTIST OF THE MONTH

Dr Lerato Ndlovu: Immunologist



https://www.superscientists.org/superscientists/ndlovu

This month, Dr Lerato Ndlovu opened our eyes to what we can achieve. Dr Ndlovu is a post-doctoral fellow at the Africa Health Research Institute, KZN. See what she has to say about the importance of believing in yourself and making an impact in your community.

Your SuperScientist top tip is to not be afraid of following your dreams. Reaching PhD level in a STEM field must have come with its own challenges - how did you overcome any difficulties you might have faced?
I was fortunate to grow up in a family that placed no limits on what I could do and achieve, and valued education and doing my best. Surrounding yourself with people who reaffirm your ability is very important when you want to achieve something. Having such a nurturing environment really set me up to believe I was capable of doing anything.

Can you tell us about what makes you passionate about immunology?
I believe the human body and the way it protects itself is magnificent and I want to identify what makes it tick - why do some people get sick and others not? Another driving force in my passion for infectious disease immunology is the HIV and TB burden South Africans face. Having seen these diseases in my family and community, I was inspired to be a part of the solution. Even when I'm tired and weary over things not working out, it's important to remember that at the end of the day, I'm trying to solve a big problem and I can't expect answers to come easy - having this mindset keeps me going.

Can you tell us more about the Science-2-Society project you initiated?
This project specifically aims to make science more accessible to the communities we run our research in or those who are affected the most, and see how just engaging with these communities impacts the way they view and understand infectious disease. As scientists, we can do all this lab work and make all these drugs, but if people don't understand why they need to take their medication or make better healthcare choices, we won't be able to achieve as much as we could if we worked together. It's so important for scientists to remember that there is a person on the other side of the research - on the other side of the sample - who might be living a completely different life to what we assume. Engagement and communication is integral to solving some of our biggest infectious disease problems in our country,

VACCINATION

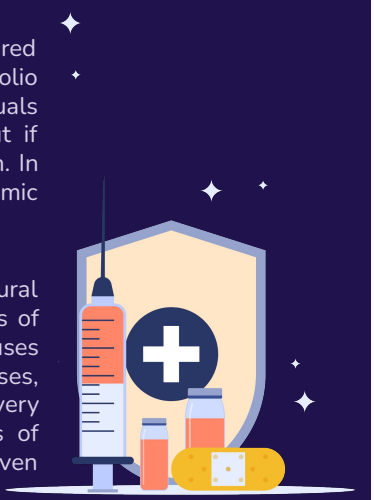
Our best shot

Dr Edward Jenner, the "Father of Vaccination", was a British physician and scientist who began the era of vaccination, including creating the world's first vaccine. Vaccination is one of the most life-saving public health interventions, allowing for protection from various diseases. In this newsletter edition, we hope the resources provided will shed light on various misconceptions about vaccines, and empower you and those around you to take your health into your own hands.

VACCINE MISCONCEPTIONS

1. **"Disappeared Diseases" -** People assume that diseases like polio have disappeared from the USA so it is not necessary to vaccinate children against them. However, polio is still widespread in other countries and could easily re-infect unprotected individuals if it were re-introduced. Adequate vaccination rates can prevent outbreaks, but if vaccination rates drop, "imported" cases of preventable diseases can spread again. In the early 2000s, low vaccination rates in England allowed measles to become endemic once again after continuous transmission was halted in the country.

2. **"Natural Immunity Is Better Than Vaccine-acquired Immunity" -** It's true that natural immunity lasts longer in some cases than vaccine-induced immunity but the risks of natural infection outweigh the risks of immunization. Wild measles infection causes encephalitis for 1 in 1000 infected individuals. For every 1000 reported measles cases, 2 people die. The combination MMR vaccine causes encephalitis only once in every million vaccinated individuals, while preventing measles infection. The benefits of vaccine-acquired immunity extraordinarily outweigh the risks of natural infection, even in cases where boosters are required.



https://historyofvaccines.org/vaccines-101/misconceptions-about-vaccines

DIABETES

Diabetes mellitus (DM), or diabetes, is a group of metabolic disorders characterized by hyperglycemia from insulin secretion defects, insulin action, or both. Studies suggest that microbial dysbiosis influences the immune response and pathophysiology of DM. In 2010, the first study showing the association between the human gut microbiota and people with type 2 diabetes (T2D) suggested that the gut microbiome may be a new biomarker for predicting DM. Contrasting T2D, type 1 diabetes (T1D) is characterized by damage to insulin-producing beta cells. While the pathogenesis of T1D differs from T2D, studies have observed an altered microbiota in T1D. Dysbiosis of the gut microbiota is suggested to occur early in life and aggravate gut inflammation before the onset of T1D. The gut microbiota may play a crucial role in preventing the initiation and progression of the T1D process by establishing a healthy microbiota as early as birth.

The gut microbiome impacts DM via 3 main pathways. *Metabolite pathway:* SCFAs produced by the gut microbiota interact with host metabolism. The gut microbiome in DM exhibits a low level of SCFA production, inducing or exacerbating the host's autoimmune response, which is related to T2D and important in the process of T1D autoimmune islet inflammation. Increased production of the SCFA butyrate in the host provides a beneficial role in b-pancreatic cell function, particularly after food ingestion, while the production or absorption of the SCFA propionate has a detrimental effect related to T2D risk. Analyzing the gut microbiota may help with understanding individual responses to dietary interventions. *Immunologic pathway:* DM is associated with chronic low-grade inflammation, with gut microbes contributing to this state. Studies suggest that lipopolysaccharides (LPSs) play a role in inflammation development and insulin resistance. It was shown that LPS initiating inflammation by binding to innate immune cells, resulting in an inflammatory response, cytokine production, and chemokine-mediated recruitment of inflammatory cells. The T2D microbiota showed increased oxidative stress response, representing a direct link to the proinflammatory state of patients with T2D. The LPS concentration is a potential tool to assess the metabolic risk profile in diabetic patients. *Neuroendocrine pathway:* Normal gut microbiota dampens the stress response of the nervous system, while dysbiosis causes an exaggerated hypothalamic–pituitary–adrenal (HPA) reaction to stress. The exaggerated HPA response results in increased cortisol release, causing exacerbated barrier dysfunction. Prolonged glucocorticoid elevation can present serious health risks, including DM. It's hypothesized that bacterial cell wall components can stimulate immune cells within the gut to release these cytokines, influencing the CNS involved in regulation of the HPA axis response. An early change detectable in DM evolution is abnormalities in autonomic balance, which could be influenced by the gut microbiome.

Full article found under "Publications & Interesting Reads" section.

JOBS & OPPORTUNITIES

Public Consultations of Evidence Considerations for Vaccine Policy (ECVP) for TB vaccines intended for adults and adolescents are open. WHO invites all those interested in the ECVP for new TB vaccines intended for adults and adolescents to review the draft document and provide comments on both the general utility of the document, and the specific guidance developed for new TB vaccine. To find out more, please click here.

Schlumberger Foundation Future Fellowship
Schlumberger Foundation 2022-2023 Faculty for the Future Fellowships awards fellowships to women from developing and emerging economies to pursue PhD or Post-doctoral research in science, technology, engineering, and mathematics (STEM) fields at leading universities worldwide. Submit by **Friday 11 November**. To find out more, please click here.

Global Health Equity Scholars Fellowship
Call for applications for the Global Health Equity Scholars Fellowship. The Global Health Equity Scholars (GHES) Fellowship is a 12-month, NIH-supported, mentored training in global health research designed to address health inequities and improve population health. Hosted by a consortium of Yale University, Stanford University, University of Arizona, and UC Berkeley, the fellowship year typically runs July-June. Apply by **Sunday 20 November**. To find out more, please click here.

Meta-Analysis and Biostatistics Online Fellowship - University of Foggia, Italy
The fellowship is a one-on-one online program that allows you to sit at home and publish by doing a meta-analysis and is hosted by a leading mentor from Italy. To find out more, please click here.

Assistant Professor of Molecular & Cellular Biology - Harvard University, Massachusetts
We seek applications for a tenure-track faculty position in the Department of Molecular and Cellular Biology. MCB is a tight-knit, supportive and collaborative research community with interests in a broad range of topics. The appointment provides access to state of the art animal facilities and core facilities for imaging, proteomics, genomics and bioinformatics. The Department is also closely associated with science initiatives at Harvard such as the Center for Brain Science, Harvard Quantitative Biology, the Harvard Stem Cell Institute, the Broad Institute, and the Center for Nanoscale Systems, and provides opportunities for interactions with the broader Harvard community. Interested applicants should submit the CV, cover letter and qualification through the ARIeS portal (https://academicpositions.harvard.edu/postings/11703). Complete applications, including letters of recommendation, should be received no later than **November 1, 2022**.

CONTACT US!

If you have any suggestions or feedback to improve this newsletter, feel free to contact us! Please send us your recent publications so we can showcase them in our Community Corner. If you are hiring/recruiting, we would be more than happy to advertise for you in the Newsletter and on our social media platforms. You can email the editors at **newsletter@saimmunology.org.za** by the 20th of each month to be featured in our next newsletter.

IMPORTANT LINKS

To renew your SAIS Membership please visit: **https://saimmunology.org.za/membership.htm**

@SAImmunology **South African Immunology Society (SAIS)** **@SAImmunologySociety**

With regards,
The SAIS Newsletter Editorial Team

Dr. Clement Gascua
Editor

Sashkia Balla
Co-Editor

Thanusha Pillay
Co-Editor