

NEWSLETTER

SOUTH AFRICAN IMMUNOLOGY SOCIETY



FEATURES

Shifting Views on High-Path Avian Influenza Vaccination

An inflammatory demyelinating disease of the CNS

How has your heritage/culture influenced your decision to be a scientist?

AWARENESS

World Alzheimer's Day - 21 Sep

Heritage Day - 24 Sep

World Rabies Day - 28 Sep

SAVE THE DATE

The Joint ALLSA and SAIS Congress

International Congress of Immunology (IUIS)

International Veterinary Immunology Symposium (IVIS)

MESSAGE FROM THE EDITOR

Dear SAIS,

Welcome to our August Newsletter. In this edition, we celebrate our Rainbow values in science and research. We asked SAIS stalwarts about how their heritage has influenced the science they do and how their culture has shaped their approach to inquiry in science and technology. Read the snippets from our heroes in science and research. We encourage all SAIS members and networks to send us your lab photos on heritage for a beautiful collage in our next edition.

Don't miss out on the IUIS congress 2023 in Cape Town, South Africa. There are only a few days left for early registration and late breaker abstract submission. Submit your late breaker abstract starting from the 30th of August 2023. Remember to apply for any stream of the travel bursary options. Also, join the ALLSA-SAIS conference in September 2023. We will continue to bring you insights from our interviews with Prof Rossouw, Prof Gray, and Prof Ngom at the upcoming IUIS congress.

Respiratory syncytial virus (RSV) is a significant health concern for aging adults and places a substantial burden on healthcare systems around the world. With the first-ever RSV vaccines now on the horizon, healthcare professionals are challenged to navigate this new prevention landscape in their practices to best protect older adults in their care. As the imminent rollout of this vaccine approaches, immunology remains a corridor conversation in most of our homes. We trust that all SAIS members will be ambassadors in dispelling fears and misconceptions in our homes. Read more on page 5 and also register for the webinar.

We hope you find this newsletter informative and engaging, and we look forward to your active participation in the upcoming events and initiatives. Thank you for being part of the SAIS community.



Happy reading!

With regards,
Dr. Clement Gascua



CONTACT US!

Please send us your recent publications so we can showcase them in our Community Corner. If you are hiring/recruiting, let us use our various platforms, the newsletter and our social media, to advertise for you. If you have any webinars, seminars, or conferences, we would be more than happy to add it to the newsletter. You can simply email the editors at newsletter@saimmunology.org.za by the 20th of each month to be featured in our next newsletter.



saimmunology.org.za



South African Immunology Society
(SAIS)



[@SAImmunologySociety](https://www.facebook.com/SAlmmunologySociety)



[@SAImmunology](https://twitter.com/SAlmmunology)

IUIS

2023
CAPE TOWN

TURN DISCOVERIES INTO TREATMENTS
27 November - 2 December 2023
Cape Town, South Africa

WHERE IMMUNOLOGISTS MEET

The International Congress of Immunology (IUIS) is the world's leading conference in the field of immunology. Here are some thoughts from the SAIS, IUIS, and FAIS presidents.



SAIS President

“ If people want to see what they will be doing in 10 years time, they must be at the conference ”



IUIS 2023 meeting President

“ There'll be a lot of things going on, posters, symposia, debates, plenaries of course... This is a chance to network ”



FAIS President

“ I'm really looking forward to seeing youth participation... I just hope it will inspire the younger people ”

LATE-BREAKING ABSTRACT SUBMISSION OPENS AUGUST 30TH!

<https://iuis2023.org/>

An African-Based Immunology Seminar Series



Genital Inflammation test device development

Prof Jo-Ann Passmore
University of Cape Town
Head, Mucosal Immunology Group

30 August 2023
13:00–14:00



An African-Based Immunology Seminar Series



Exposure to lung-migrating helminth protects against murine SARS-CoV-2 infection through macrophage-dependent T-cell activation

Dr Oyebola Oyesola
Laboratory of Parasitic Diseases
NIH in Bethesda, Maryland

27 September 2023
Time TBC




ALLSA

SAIS

2023 CONGRESS

28 SEPTEMBER - 01 OCTOBER
CENTURY CITY CONFERENCE CENTER
CAPE TOWN



EARLY BIRD REGISTRATION OPEN





IVIS2023
SOUTH AFRICA

13th INTERNATIONAL VETERINARY IMMUNOLOGY SYMPOSIUM
17-21 NOVEMBER, 2023



Grant applications and late-break poster abstract submissions now open!

Save the Date

Toward a TB-Free World: New Tools Summit

Join the Stop TB Partnership New Tools Working Groups and Product Development Partnerships for a day dedicated to TB research ahead of the 2023 Union World Conference on Lung Health

+ 
New Diagnostics Working Group


Working Group on New TB Vaccines



Tuesday, 14 November 2023
Paris Marriott Champs Elysées Hotel, France

- *Keeping the Promise Report Launch*
- Working Group Annual Meetings
- TB Alliance Stakeholders Association Annual Meeting
- Joint Networking Reception

FIND >>>
Diagnosis for all



 TB Alliance

**CHARTING
NEW TERRITORY
IN
RSV
VACCINATION:**
INTERNATIONAL PERSPECTIVES
ON PROTECTING OLDER ADULTS

[REGISTER NOW](#)



Tune in to this live webinar on **Wednesday, September 13, 2023 at 2:00 PM Eastern (11:00 AM Pacific)** to hear from an international panel of renowned experts in RSV and vaccine science as they discuss:

- Impacts of RSV on aging populations and healthcare systems across the globe
- Mechanisms of action for RSV vaccines in late-stage development
- Latest safety and efficacy data for upcoming vaccines against RSV



Evaluation of Xpert Carba-R for detecting carbapenemase-producing organisms in South Africa

Authors: Sanelisiwe T. Duze¹, Teena Thomas^{1,2}, Tshogofatso Pelego², **Sabelle Jallow**^{1,3}, Olga Perovic^{1,3}, Adriano Duse^{1,2}

Affiliations:

¹Department of Clinical Microbiology and Infectious Diseases, Faculty of Health Sciences, School of Pathology, University of the Witwatersrand, Johannesburg, South Africa

²Infection Control Services Laboratory, National Health Laboratory Services, Charlotte Maxeke Academic Hospital, Johannesburg, South Africa

³Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses, National Institute for Communicable Diseases, Johannesburg, South Africa

Take home message:

In this article, the authors evaluated the performance of the Xpert Carba-R assay for detecting the five common carbapenemases in carbapenemase-producing organisms in Johannesburg, South Africa between April 2021 and September 2021. The assay demonstrated 98% sensitivity and 97% specificity. It was also able to detect all the carbapenemases in double carbapenemase producers, as well as carbapenemases in non-fermenter organisms. The Xpert Carba-R assay, therefore, allows the rapid (< 1 h) and accurate identification of the common carbapenemases in pure bacterial cultures and rectal swabs. This assay can aid in the timeous institution of appropriate treatment and infection prevention and control measures.

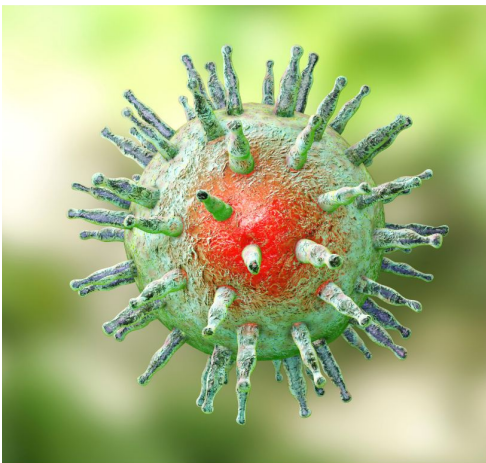
DISEASE OF THE MONTH

An inflammatory demyelinating disease of the CNS

In 1868, Jean-Martin Charcot introduced the term "sclérose en plaques," later known as multiple sclerosis (MS). MS is a chronic autoimmune disorder affecting the central nervous system (CNS), characterized by neuroinflammation and neurodegeneration. Globally, MS diagnoses occur at a rate of one every five minutes, totaling nearly 2.8 million cases, with a 30% increase since 2013. Diagnosis relies on clinical, biochemical, and radiological criteria, demonstrating evidence of CNS lesions in both time and space.



Genetic factors contribute to MS susceptibility, with elevated risk among first-degree relatives and monozygotic twins of affected individuals. The major genetic risk factor is the HLA gene cluster within the MHC locus. Recent research has identified 233 genetic variants associated with MS susceptibility, many impacting immune functions and found in adaptive and innate immune cells. These variants explain approximately 48% of the genetic predisposition to MS, suggesting the presence of additional undiscovered genetic factors. The gut microbiome's role in MS has garnered attention, influencing the development of pathogenic CNS-reactive T cells and modulating CNS-resident cell activity. MS-related alterations in the gut microbiome reveal variations in pro-inflammatory and anti-inflammatory responses. The genus *Akkermansia*, found elevated in some MS patients, has been linked to T helper 1 responses, but its effects vary by strain. The microbiome also associates with regulatory T cells (Tregs), with certain genera promoting IL-10+ Tregs. Furthermore, gut-generated IgA-producing plasma cells can migrate to the CNS, suppressing inflammation through IL-10 production.



Epstein-Barr virus (EBV) infection is associated with MS, potentially contributing through mechanisms like dysregulated T cell activation and molecular mimicry with EBV antigens. EBV-reactive T cells can cross-react with CNS antigens, and EBV can induce a self-reactive B cell immune response targeting CNS antigens. While EBV is linked to MS, it doesn't solely cause the disease, likely requiring interactions with other factors in susceptible individuals. Vaccines targeting EBV may offer preventive potential for MS, albeit with early-age vaccination challenges. Factors like race, ethnicity, latitude, diet, obesity, smoking, and environmental exposures are also believed to influence MS development. Research explores the roles of specific factors like methionine and the herbicide linuron in promoting CNS inflammation and astrocyte pathogenic activities.

In the past three decades, over 15 disease-modifying therapies (DMTs) have received approval for MS. These DMTs primarily target the peripheral immune system and can be categorized into immunomodulatory, anti-trafficking, and immunodepleting mechanisms. However, existing therapies have limitations in halting MS progression. Encouragingly, ongoing clinical trials explore promising treatments, including Bruton tyrosine kinase (BTK) inhibitors targeting B cells and peripheral myeloid cells. Some BTK inhibitors may also influence microglial functions, potentially promoting remyelination. Novel therapies aim to re-establish antigen-specific tolerance without compromising protective immunity, employing strategies like antigen-loaded tolerogenic dendritic cells, autoantigen-specific regulatory T cells, and nanoparticle-based approaches. Environmental factors associated with MS, such as EBV infection and the microbiome, offer new therapeutic avenues, including EBV vaccines, probiotics, and synthetic probiotics engineered to produce therapeutic molecules. Additionally, insights into MS pathogenesis may emerge from studying circadian biology and pollution effects. In summary, MS is a complex disease shaped by genetic, environmental, and lifestyle factors, and ongoing research is revealing new insights into its origins and progression.



SOUTH AFRICAN HERITAGE DAY

How has your heritage/culture influenced your decision to be a scientist?



Well, I grew up in KwaZulu-Natal and my grandmother knew exactly which herb to use for any ailment. So, I guess the curiosity started there. My family always encouraged education and competition, so you had to be the best, even amongst your cousins. So, my close cousin and I competed from grade 1 until university. I guess I knew much earlier that I would do something science-related and teachers in all schools I attended encouraged me in that direction. I probably didn't decide what type of science until I was in my first year in UKZN. Right there and then I chose to be an immunologist, influenced by the then VC. I love discovery science and immunology is exactly that for me. There is a lot we don't know and so much to discover. Africa has so much to offer in understanding and broadening the field of immunology, indigenous knowledge on disease treatment and homeostasis (spirituality and health), which is so critical in immunology. I bet everything in human health has an immunological answer. For me, bringing in ideas from diverse backgrounds with different upbringings and skill sets is what will advance discovery in immunology. Yes, a Zulu boy from a village has a unique contribution to the field, we often forget that.

Truth be told, I consider myself to be an accidental scientist, who was an opportunistic beneficiary of circumstances which aligned in my favour over time. The reason I ended up studying medicine was largely predicated upon cultural (and paternal) expectation in the 1980s in South Africa, when professional opportunities were limited to people of colour. At the time, top academic performers among school learners of Indian descent, were expected to go on to study Medicine, with medical doctors being highly regarded among the community. My own inclination was to do Chemical Engineering, however, a condition of my bursary was to be studying Medicine. I completed my specialist training in 1996, soon after the first democratic election in South Africa, which unfortunately also coincided with a emigration of skilled personnel from South Africa. The changes in South Africa, resulted in people like myself suddenly being afforded opportunities which would otherwise have been unavailable to people of colour under apartheid, or of the same level of experience elsewhere. Fortuitously, my graduating as a paediatrician coincided with the start of the largest vaccine trial ever to be undertaken in Africa at the time. I was able to secure the position of the lead clinician on the trial, despite having limited research experience and due to the paucity of clinician scientists in SA at the time. Leveraging on the opportunity offered way back in 1996, I came to realise the potential to impact on lives of people *en masse* by being a clinician scientist, and particularly one focussed on vaccines. Vaccines have withstood the test of time in relation to their massive public health benefit. Having experienced the research in an exciting project, which now contributes to saving the lives of at least 500,000 children annually, I realised the critical contribution that researchers are able to make to society, and consequently continued growing as a clinician scientist. Hopefully, what has now been established at my research unit, Wits Vaccines and Infectious Diseases Analytics (Wits-VIDA), will remain a legacy of my own journey and establish a strong culture at Wits for the next generation of clinician scientist in the field of vaccinology.



I'm not entirely sure why I decided to become a scientist but it probably because I have a naturally curious and restless mind. I have always wanted to understand things and I ask a lot of questions and still do. I guess I was fortunate to grow up in a family where constant questioning was not discouraged. I wouldn't say it was actively encouraged, as I wasn't raised in an academically-focused household, but my parents recognised I needed stimulation. And so they bought a subscription to the Encyclopaedia Britannica which I read avidly and I knew exactly which volumes contained my favourite bits of information. Incidentally, the EB originated in Scotland and I suspect that the smart door-to-door salesperson hyped this aspect once he heard our Scottish accents! I have continued to enjoy learning and researching about things that surround me including living organisms but its viruses that have fascinated me the most – particularly how such infinitesimal particles, that can't survive on their own, manage to outwit our immune system and cause devastating global pandemics!





Prepared by Prof. Celia Abolnik

NRF-DSI SARChI: Poultry Health and Production, Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria

High pathogenicity avian influenza (HPAI) is a highly infectious, mostly lethal respiratory and neurological disease of birds, especially poultry, and some mammals including humans. HPAI is normally caused by influenza A viruses of the H5 and H7 subtypes, where “H” refers to the hemagglutinin (HA) glycoprotein that projects from the virus’ surface. The HA protein plays an important role in the virus’ infection cycle by docking the virus to the host cell receptor to initiate internalization. Antibodies against epitopes on the HA protein effectively neutralize the virus by preventing cell binding, and consequently infection. The HA protein is an excellent vaccine target, and vaccines based on the HA protein can be highly effective against the homologous H subtype. Ample experimental and field data demonstrates that, where vaccine and field strains are antigenically closely matched, 100 % protection against morbidity and mortality can be achieved. Just as importantly, such vaccination lowers virus excretion, slowing or preventing the spread of infection.



The caveat is that the influenza A virus mutates rapidly. If the antigenic relatedness of a vaccine and a circulating field virus falls below a certain threshold, a vaccinated host that becomes infected, whilst still appearing healthy, still sheds vast amounts of HPAI virus into the environment. Not only does this increase the chances of spread to other susceptible populations, but the longer a virus circulates in a population, the greater the chance of other adaptive mutations occurring (such as the ability for airborne transmission), or genomic reassortment if other influenza A virus subtypes are also present.

The possibility of a “silent” HPAI infection status in a vaccinated population, poultry in this case, is the major reason why vaccination against HPAI has been banned here in South Africa and by international trade partners. If a country opted to vaccinate their poultry, it would firstly need to use killed or recombinant vaccines with DIVA (Differentiating Infected from Vaccinated Animals) capability, secondly, update the vaccine regularly to keep pace with antigenic drift in the field virus, and thirdly, incur substantial additional spending on surveillance to verify the absence of circulating field virus in flocks. Therefore, many countries have historically opted not to vaccinate against avian influenza. Instead, quarantines are enforced in the surrounding area and the infected flock is depopulated by mass culling (“stamping out”).

HPAI in poultry emerges via specific gene mutations in low pathogenicity (LPAI) progenitor viruses, a biological process that only occurs in gallinaceous poultry like chickens, turkeys and quails and ratites (ostriches). The LPAI progenitor viruses are benign and ubiquitous in their natural hosts (wild water birds like ducks, geese, swans and waders), and are transferred to poultry where species mix or from the contaminated environment. HPAI spreads rapidly and can wipe out a poultry farm of hundreds of thousands of birds within days if left unchecked.

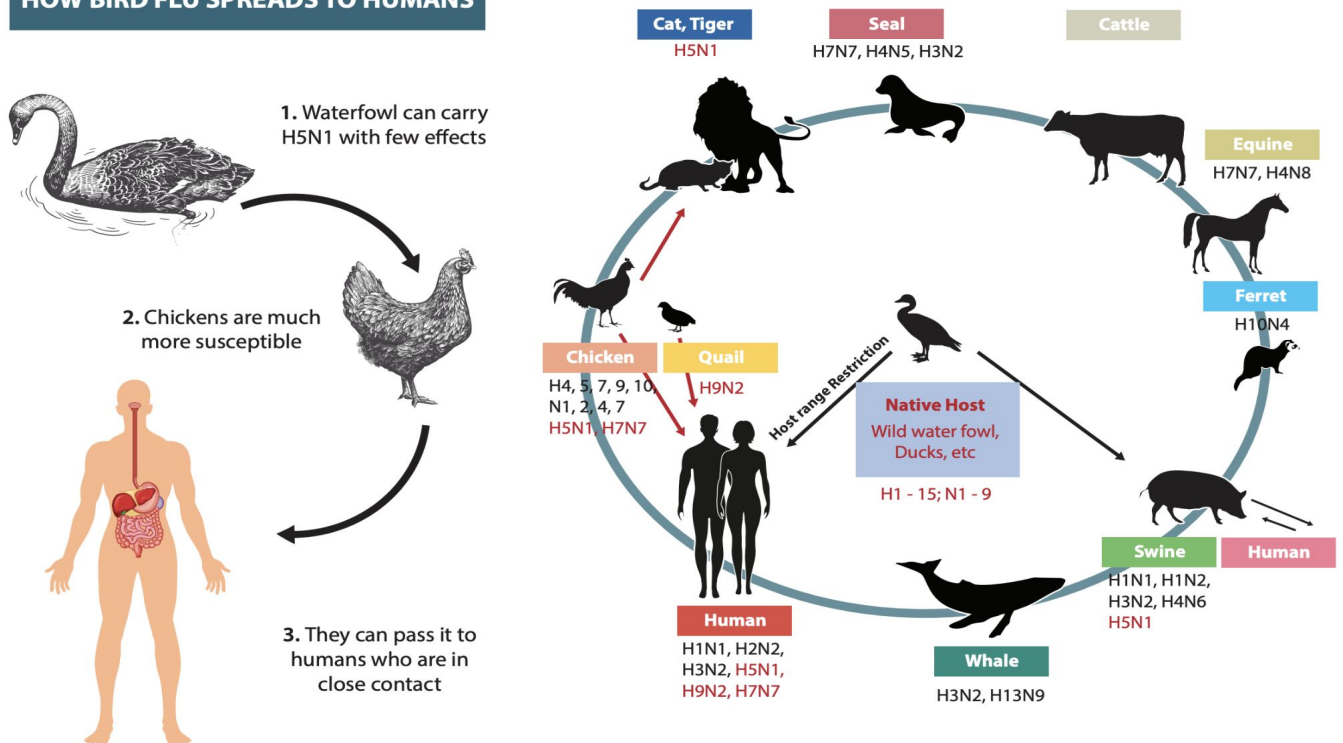


Prepared by Prof. Celia Abolnik

NRF-DSI SARChI: Poultry Health and Production, Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria

In the past, stamping out worked well to control localized HPAI outbreaks in many countries and mitigated against the use of vaccines, but the global ecology of HPAI has changed dramatically over the past decade. The so-called Goose/Guangdong (Gs/GD) H5N1 HPAI lineage emerged in East Asian poultry in the mid-1990's and wasn't properly controlled. After a prolonged regional circulation in multiple poultry species including farmed ducks, this H5 HPAI virus, whilst still lethal to poultry, gained the unusual ability to sub-clinically infect migratory waterbirds. The virus gained further fitness by undergoing genomic reassortment with other influenza A strains, giving rise to multiple genetic lineages that spread in pandemic waves from Asia to other continents. By 2014 a reservoir of Gs/GD H5 HPAI was established in wild duck populations in the northern hemisphere, from where it continues to disseminate over vast distances with the migration movements of waterbirds, reaching as far south as South Africa on multiple occasions since 2017, and most recently the countries of South America.

HOW BIRD FLU SPREADS TO HUMANS

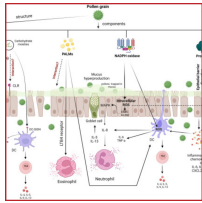


The number of annual spillover outbreaks in poultry caused by Gs/GD H5 HPAI viruses have reached unprecedented levels globally. It is no longer feasible for countries to continue trying to control HPAI by stamping out without threatening global food security, notwithstanding the devastating impact the Gs/GD H5 HPAI virus is having on avian biodiversity (endangered bird species like African penguins), and the looming human health threat. Vaccination against HPAI is firmly in the spotlight at the moment, and countries once dead set against vaccination are now changing their stance and beginning to put policies and plans for it in place, because all indications are that Gs/GD H5 HPAI will be around for the foreseeable future, and it is constantly evolving.

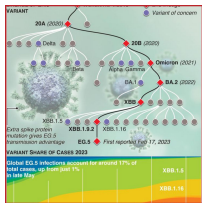
[Click here to visit the World Organization for Animal Health](#)



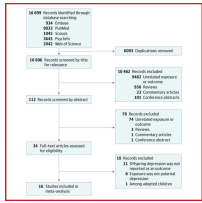
Better Responses Seen With Booster mRNA COVID-19 Vaccine in Pregnancy
Primary Care, Practice Update, 2023 Aug.
https://www.practiceupdate.com/news/43122/2/6?elsca1=emc_eneews_daily-digest&elsca2=email&elsca3=practiceupdate_primary&elsca4=primary-care&elsca5=newsletter&rid=NDY1Mzc5NzcwNTYyS0&lid=20849336



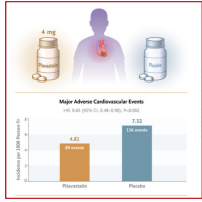
Does pollen exposure influence innate immunity to SARS-CoV-2 in allergy or asthma?
Hajighasemi, S. *et al*, J Allergy Clin Immunol. 2023 Aug;152(2):374-377.
doi: 10.1016/j.jaci.2023.05.008.



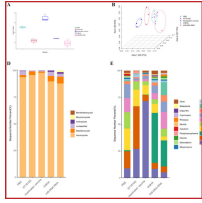
First case of new Covid-19 variant, 'Eris', confirmed in Gauteng
Rall, S. IOL News, 2023 Aug.
<https://www.iol.co.za/news/south-africa/gauteng/first-case-of-new-covid-19-variant-eris-confirmed-in-gauteng-0a64f1f1-0a20-4a51-945f-b55b50f88968>



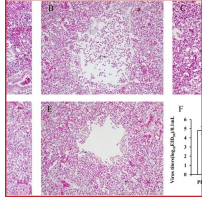
Paternal Depression Linked to Depression in Offspring
Dachew, B. *et al*, JAMA Netw Open. 2023 Aug 1;6(8):e2329159.
doi: 10.1001/jamanetworkopen.2023.29159.



Pitavastatin for Preventing CVD in Patients With HIV Infection
Huynh, K. Nat Rev Cardiol. 2023. 1-1
doi.org/10.1038/s41569-023-00920-z



Recombinant hemagglutinin protein and DNA-RNA-combined nucleic acid vaccines harbored by yeast elicit protective immunity against H9N2 avian influenza infection
Zhang, H. *et al*, Poultry Science. 2023 Jun 1;102(6):102662.
doi.org/10.1016/j.psj.2023.102662



Vaccination with recombinant *Lactococcus lactis* expressing HA1-IgY Fc fusion protein provides protective mucosal immunity against H9N2 avian influenza virus in chickens.
Zhang, R., Xu, T., Li, Z. *et al*. 2023. Virol J 20, 76.
doi.org/10.1186/s12985-023-02044-9.

Florian Kramer & Stacey Schultz-Ch
H5N1 avian influenza viruses of the Guangdong/1/96 lineage have been in wild birds for many years, have caused significant economic losses on the industry and have caused zoonotic since 1997. However, the recent spread of H5N1 virus to the Americas and its spread in mammals have raised concerns about pandemic potential.

We need to keep an eye on avian influenza
Kramer, F., Schultz-Cherry, S. Nat Rev Immunol. 2023. 23, 267–268.
doi.org/10.1038/s41577-023-00868-8

Director, Mass Spectrometry - University of Massachusetts - Chan Medical School - Department of Biochemistry & Molecular Biotechnology

The Department of Biochemistry & Molecular Biotechnology (BMB) at the University of Massachusetts Chan Medical School seeks applicants for a director of the UMass Chan Spectrometry Facility; this is a non-tenure track faculty position. We are searching for a highly motivated and enthusiastic individual, committed to diversity, creativity, and collaboration, to join our team of actively engaged faculty and lead our Mass Spectrometry Facility <https://www.umassmed.edu/msf>. The core has a long history of supporting assays in quantitative proteomics (LFQ, TMT, SILAC), protein characterization (intact), metabolomics/lipidomics (untargeted), and small molecule quantitation (targeted). The variety of instruments (4 Orbitraps, 2 QTOFs, 2 triple quadrupoles) and software platforms in the core enable both a capable and diverse approach to solving problems in biological research.

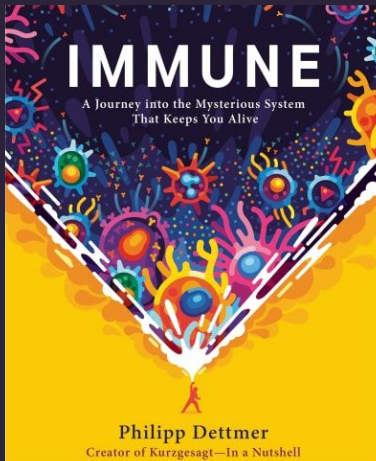
This is an exciting opportunity in mass spectrometry as the existing and developing programs requires a highly-qualified leader. Competitive candidates will have a PhD in a life or physical science discipline and at least five years of professional experience in the application of a variety of sophisticated mass spectrometric methods to biology and/or medicine and have a demonstrated track record of outstanding accomplishment. The successful candidate contributes to our missions of education, inclusion and service, and play an active role in the Department as we expand in a new phase of growth. Applicants with a strong commitment to enhancing diversity and inclusivity are encouraged to apply.

The following application materials should be submitted via academicjobsonline.org/ajo/jobs/25268

1. A one-page cover letter describing the applicant's interest.
2. The applicant's CV.
3. A Research Summary (maximum 3 pages, including figures, not including references) that describes the applicant's most significant accomplishments and vision for this position.
4. A DEI statement of no more than 2 pages that describes the applicant's understanding of diversity, as well as past experiences and future plans to advance diversity, equity and inclusion.
5. Three professional letters of reference from colleagues/mentors who are familiar with the applicants work and potential for success.

Applications accepted until the position is filled. To receive maximum consideration please submit by **September 15th, 2023**.

THE GRAND PRIZE!



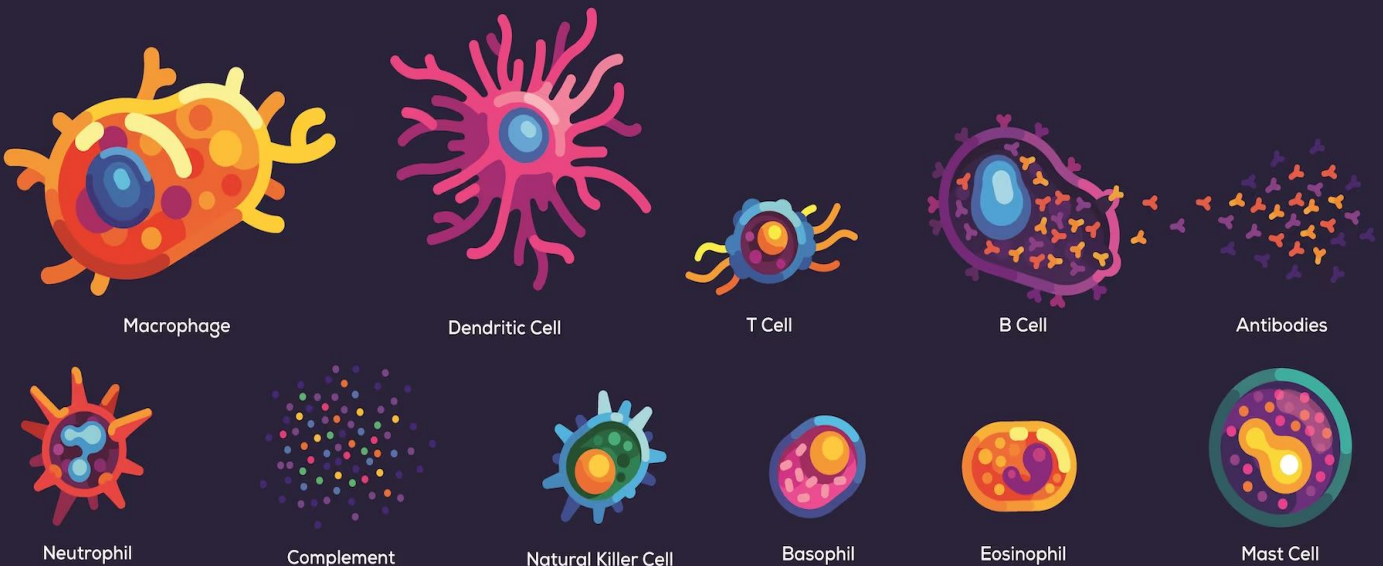
Welcome to the third newsletter survey! If you're not sure what to do by now, here is a reminder: the SAIS Newsletter editorial team has set up a quick survey in every newsletter edition from June to October. All surveys consist of 3 simple questions that will take you less than 10 minutes of your time.

Please answer all survey questions every month, from the June to the October edition. You could be to be one of two winners for the grand prize- a copy of the beautifully illustrated book "IMMUNE: A journey into the mysterious system that keeps you alive", by Philipp Dettmer.

The two winners of this grand prize will be announced in the November newsletter edition!

Click the "Take Survey" icon to follow the link and answer these 3 easy survey questions.

- Is posting announcements and webinars useful?
- Who was the SuperScientist of the month for April?
- Do we cover enough content for the veterinary immunology division?



The SAIS would like to thank all members for their ongoing support! It is highly appreciated. To continue being a part of our growing community, please keep up to date with your membership.

To update your membership and familiarise yourself with the new renewal process, please visit

<https://saimmunology.org.za/membership/>



RESOURCES TO FOLLOW

Check out these resources for more immunology-related information:



SOCIALS TO FOLLOW

Social media is a great way to stay up-to-date with the immunology community! Why not check out/follow these social media handles:



@VirusesImmunity



@SciImmunology



@TrendsImmuno

Was our piece on MS thought-provoking? Let us know! Your feedback is invaluable to us.

The SAIS Newsletter Editorial Team

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Thanusha Pillay

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