VIROLOGY MATTERS

AUGUST 2018

Rest in peace, Professor Bongani Mayosi, our beloved Dean, mentor and friend

"It is with great sadness that we say good-bye to Professor Bongani Mayosi. Bongani was not only Dean, but also a mentor and a friend to many of us in Virology. He was a unique individual, with a generous spirit. Bongani was a world-class cardiologist, receiving numerous local and international awards. He will be remembered for his scientific excellence, his commitment to transformation, his influence on the faculty, his impact on changing the landscape of South African health sciences, and his dedication to improving public health in the country. Bongani believed that for us to rise, we need to lift people around us. We will miss him". **-Carolyn Williamson, Head of Division of Medical Virology.**

Reflections from the Division:

"I am so heartbroken about Prof Mayosi's passing, and my deepest sympathies go out to his wife Nonhlanhla, his daughters and the family, and the many colleagues who were close to him, whose grief and loss must be immeasurable. His passing has made me think deeply about many things, but there are two things that I would like to share, the first being about what is really important in our dealings with each other. When I think back on all the interactions I had with Prof Mayosi, I can never remember a moment when he did not treat those around him with dignity, respect and kindness, even in very tense situations that I witnessed. Many people at UCT, especially black staff and students, have told of their experiences of an alienating and difficult institutional culture. While there are necessary changes that need to be made to processes and curricula, the institutional culture is primarily the people who work and study here. We lost someone who embodied the kind of culture we should be enacting - someone who spent the time greeting and talking to everyone as soon as he entered work, starting with campus security at the door, to welcoming new Professors when they moved to Cape Town. He 'saw' people, acknowledged them, was interested in them. The second thing that has touched me powerfully is the many staff and students who told us about how much Prof Mayosi believed in them, motivating them to achieve their degrees or progress in other ways, so that they achieved more than they even believed themselves capable of. Whilst I strive to be a good supervisor, this has challenged me deeply about whether and how I communicate to my students how extraordinary they are and how much I believe in them. To keep Prof Mayosi's legacy alive, even though he is gone, I am committing to caring in a more real and sustained way for students and staff around me, to really see them, and also finding ways of communicating to my students how much I believe in them." **-Associate Prof Wendy Burgers**

"As a PASS staff member, I did not interact directly with Prof Mayosi, but can comment on what I observed during student protests at Health Sciences campus when he took over the deanship. He was sincere and commited to find a solution to meet the demands of the students and have intervened on countless occasions against the militarisation of the Health Science campus. He lead from the front and even marched with the students not to have private security on campus. The Health Science students were by far the most disciplined and respectful protestors compared to what happened on the rest of wider campus, as a result of his leadership and willingness to engage.

Hoping that his tragic death will make all reflect, and inspire all to try and make a difference for the better." **–Anonymous PASS staff member**

"If we remove all the obvious from any individual, race, gender, position, status. At the end we are all human, sharing the same hurt, joy, disappointment and happiness. Therefore, firstly, we need to understand our purpose, then to acknowledge, appreciate and to be tolerant will be an inherent character, as these are attributes we attach to ourselves." **–Anonymous PASS staff member**

"Even though I didn't ever have an opportunity to interact with Prof Mayosi myself, I saw him speak and have seen him around campus. He had such a warm and unintimidating presence. His passing had a profound impact on me and it truly opened my eyes about this tough environment that we work in and how it affects ALL of us. My heartfelt sympathy goes out to Prof Mayosi's family, friends, colleagues and everyone whose lives he touched. In this time, and going forward,

I hope that the UCT community will remember to support each other and be kind to each other, PASS staff, academics and students alike." **–Anonymous academic staff member**

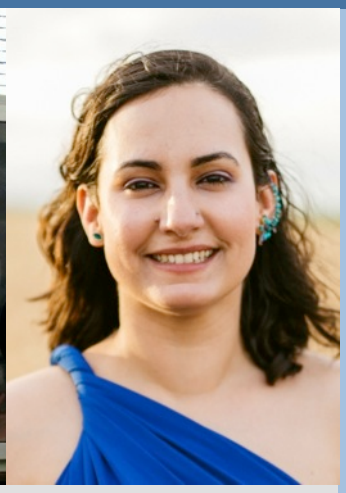
In Remembrance of Emeritus Professor Keith Dumbell

Professor Keith Dumbell joined UCT as a Professor of Medical Virology in the mid 1980s. As a Clinical Virologist he had been Head of the Virology Department at St Mary's Hospital in London, where he was recognized as one of the key international experts on smallpoxvirus and was very active in the smallpox eradication campaign.

At UCT he stimulated research in Medical Virology using molecular biological techniques, and the poxvirus research team he initiated 30 years ago is still active. Despite the fact he was in his 90s, he still visited regularly and gave relevant advice - mainly on techniques he had used since the late 1940s - to our post-graduate students.

His insights into virology, his keen intellect and his sense of humour will be missed. **–Profs Anna-Lise Williamson and Ed Rybicki**

New staff and students



Bruna Galvao

I came to South Africa from Mozambique for my University studies in 2002. I studied at UCT, finally graduating with a Ph.D. from the Department of Molecular and Cell Biology. My Ph.D. and Post-doc research revolved around understanding some of the cell surface structures and mechanisms which the opportunistic anaerobic bacterium *Bacteroides fragilis* uses to interact with its human host. This included the identification of a collagen binding MSCRAMM (microbial surface components recognizing adhesive matrix molecule) and the isolation and identification of pilus proteins. I then worked as a researcher at the Biopharming Research Unit with Prof Ed Rybicki where I was involved in creating an antibody phage-display library to be used for the identification and production of antibodies against important viruses such Human Papilloma Virus (HPV) and African Horse Sickness Virus (ASHV).

This year I joined the HIV Diversity Group to work as Project Manager, taking over from Debbie Stewart after her retirement. Once I return to work after having my second daughter I will also be getting involved in the research side of things where I will likely be working on the group's CAVD (Collaboration for AIDS Vaccine Discovery) project where we contribute towards the development of HIV-1 clade C-specific reagents and assays.

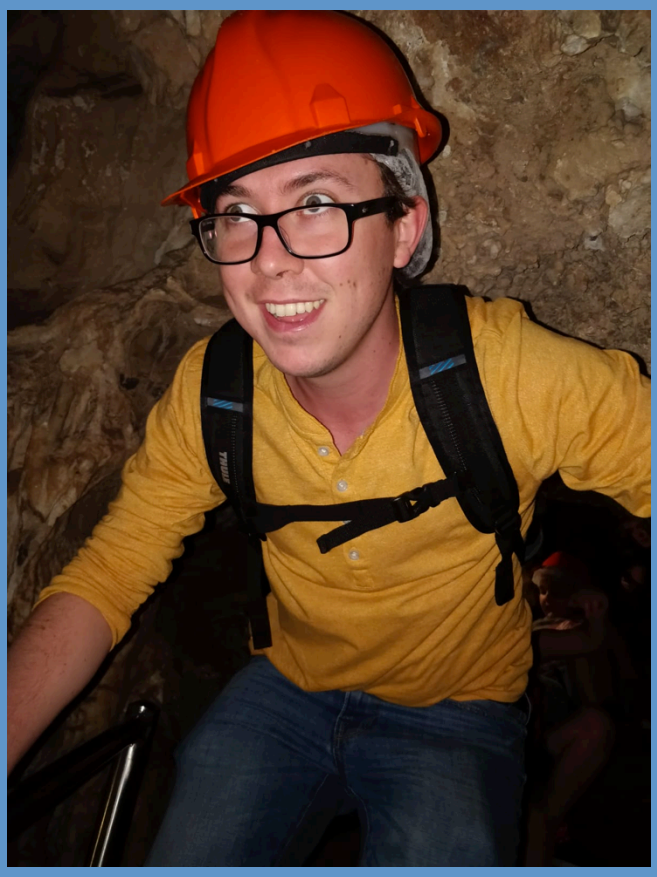
Celia Mehou-Loko

Celia graduated from the University of Lausanne in December 2013 with an M.A. in English Literature, Gender Studies and Translation. Since arriving in South Africa, she has worked with UNAIDS as an assistant to the country office Communications and Advocacy Officer; then she joined the Centre for the AIDS Programme of Research in South Africa (CAPRISA) as a Coordinator for the Adolescent Programme, a programme providing basic sexual reproductive health services to young women in five schools in rural KwaZulu-Natal. Prior to joining Lindi Masson's group in July 2017 as Clinical Project Coordinator, Celia spent 10 months in the Jaspan/Gray group as a Study Coordinator for several infant studies.

New staff and students

Gert Marais

I completed my MBChB at the University of Pretoria in 2013 with distinction and as the top student in the final year. I went on to internship at Steve Biko Academic hospital and community service in Klerksdorp where I spent the year in Anaesthesia, completing a Diploma in Anaesthetics. Subsequently I went to the UK for an MSc in Virology at Imperial College London, which I received with distinction. My thesis was titled "Interleukin-12 Gene Delivery by a Hybrid Bacteriophage-Adeno-Associated Viral Vector for Cancer Immunotherapy Applications". I did the MSc through a Commonwealth Scholarship and also received the Dean's prize for the top student in the MSc program. I returned to South Africa, and prior to joining the Virology department as a Registrar at UCT, I was practicing as a medical officer in Anaesthesia in Johannesburg.



Marius B. Tincho, originally from Cameroon, became a South African resident in February 2017. He came to South Africa in 2010 to continue with his university studies after completing a B.Sc. in Biochemistry at the University of Buea, Cameroon. In December 2011, he completed a B.Sc. (Hons) in Biotechnology at the University of the Western Cape (UWC) and in March 2014, Marius completed a Masters degree in Biotechnology with specialization in Structural Bioinformatics at UWC under the supervision of Dr Ashley Pretorius. The aim of the study was to identify novel putative antimicrobial peptides, which can be used for the diagnosis and prevention of HIV. Following some promising in-silico results from his Masters study, Marius embarked on a Ph.D. degree in 2014 with the thesis title: "In-silico optimization and molecular validation of putative anti-HIV antimicrobial peptides for therapeutic purpose" and graduated in April 2017. He then stayed with the same area of research for another year to complete some outstanding work.

In July of this year, he joined the HIV/TB Immunology and Pathogenesis Lab, under the supervision of Prof Wendy Burgers. His project aims to the elucidate the role of circulating Tfh in the development of broadly neutralizing antibodies during HIV infection.

New staff and students

Brian Kullin

Brian is a microbiologist with a research interest in anaerobic bacteria, particularly those that are associated with human health and disease. He joined the GEMS Laboratory in May as a Scientific Officer and will be assisting on projects looking at the roles that various bacterial vaginosis-associated bacteria and their products, as well as probiotic bacteria, have to play in genital mucosal health amongst South African women.

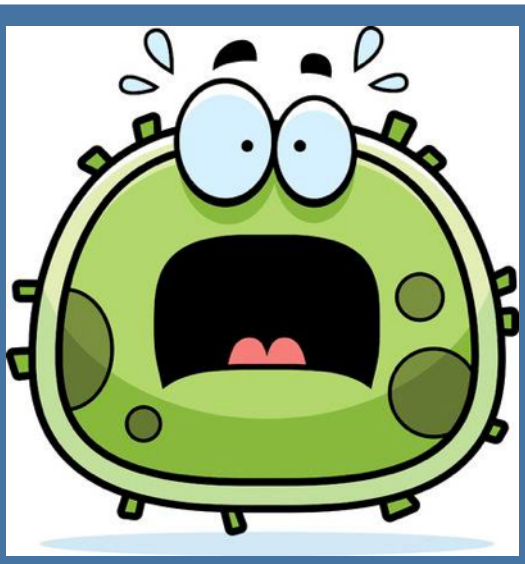
Walter Nevondo

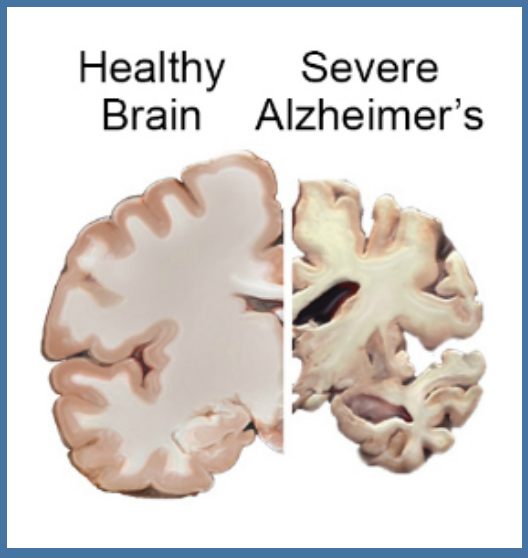
Walter completed his Honours degree in Microbiology at the University of Limpopo followed by three years of industry work. In 2011, he began his M.Sc. (Biotechnology) at the University of the Western Cape (UWC) and then his Ph.D. in 2013. In 2015, he joined the UCT Pathology Department as a Scientific Officer in Prof Carolyn Williamson's Lab. After almost two years, he went back to UWC to work in the Single Cell Genomic Platform. He is back in Prof. Williamson's Lab as a Postdoctoral Fellow working on an HIV-1 cure project.

Leah Whittle

Leah joined Prof Anna-Lise Williamson's group to do her M.Sc. on designing a vaccine against the bovine disease East Coast Fever (ECF), caused by the parasite *Theileria parva*. She completed her honours last year in the Department of Molecular and Cell Biology (MCB) at UCT. She also did her undergrad in that department.

Have you heard?





Antiviral activities for old antibiotics?

A recent study published in Nature Medicine found that topical administration of aminoglycoside antibiotics increased resistance to infection with herpes simplex virus 1, influenza and Zika viruses by inducing expression of interferon-stimulated genes in dendritic cells in the vaginal and lung mucosa.

Gopinath, S., et al. Topical application of aminoglycoside antibiotics enhances host resistance to viral infections in a microbiota-independent manner. Nature Microbiology 2018. 3:611–621.

Herpes viruses implicated in Alzheimer's disease

Two recent studies suggest that herpes viruses might trigger Alzheimer's pathology. One group found that two strains of human herpesvirus were significantly more abundant in the brains of people with Alzheimer's disease. Disease-related genes were also differentially expressed in the brains of Alzheimer's patients who had these strains of herpes. Another group used mouse models and human neuronal cell culture to show that a herpes infection could seed amyloid-β plaques. An abnormal build up of these plaques, as well as tau tangles, are thought to be major drivers of the ultimately fatal disease.

Readhead, B., et al. Multi-scale analysis of independent Alzheimer's cohorts finds disruption of molecular, genetic, and clinical networks by human herpesvirus. Neuron 2018. doi.org/10.1016/j.neuron.2018.05.023.

Eimer, W.A., et al. Alzheimer's disease-associated β-amyloid is rapidly seeded by herpesviridae to protect against brain infection. Neuron 2018. In press.

Ph.D. Graduates

Smritee Dabee

Supervisor: A/Prof Jo-Ann Passmore
Co-Supervisor: Dr Heather Jaspan

My Ph.D. aimed to evaluate biological risk factors for HIV infection in adolescent girls and young women, including genital inflammation, cervical cellular activation, vaginal microbial composition and use of hormonal contraceptives. In addition, I investigated the impact of sexually transmitted infections, bacterial vaginosis (an imbalance in the genital microbiota) and vaginal yeast infections on these risk factors for HIV.

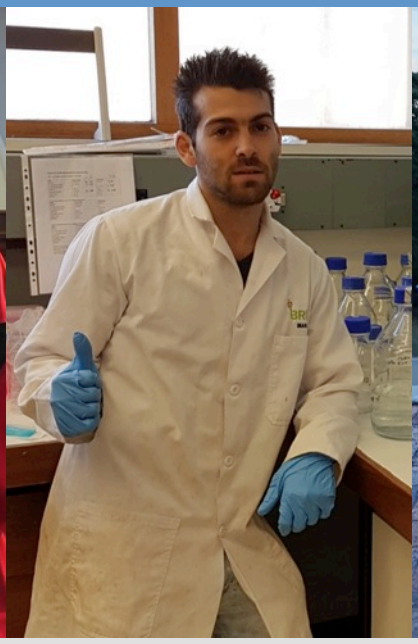
My study showed that, despite being asymptomatic, bacterial vaginosis and genital infections were accompanied by significantly increased levels of genital inflammation and cellular activation, potentially putting these young women at a higher risk of HIV infection. Overall, the thesis describes physiological factors that make adolescent girls and young women in South Africa so vulnerable to HIV, and the importance of treating genital infections as part of HIV prevention strategies.

Ph.D. Graduates

Emmanuel Margolin

Supervisor: Prof Anna-Lise Williamson
Co-Supervisors: Dr Ros Chapman, Dr Ann Meyers and Prof Ed Rybicki

My Ph.D. thesis describes the development of a plant-based expression platform for the production of trimeric HIV Envelope glycoproteins. Soluble gp140 antigens were designed from 2 rationally selected HIV-1 isolates and transiently expressed in *Nicotiana benthamiana* plants. Rabbits were immunized with the affinity-purified proteins resulting in the elicitation of high titres of binding antibodies and some tier 1 neutralizing antibodies. The purification of the trimer was refined to include size exclusion chromatography enabling the recovery of trimeric Env and the removal of undesired aggregates. Immunization of rabbits with the SEC-purified protein resulted in improved trimer-binding antibodies and tier 1 neutralizing antibodies.



Priming the immune response with recombinant modified vaccinia Ankara encoding a subtype C gag mosaic and a matched gp150 antigen improved the elicitation of neutralizing antibodies further. In addition, both affinity-purified and SEC-purified proteins elicited V1V2 binding antibodies which were the correlate of protection in the RV144 trial. Low expression levels of the recombinant Env antigens prompted the co-expression of human molecular chaperones to improve the production of the recombinant protein. Co-expression of human calreticulin resulted in a 12.7-fold increase in expression levels. This approach was found to be broadly applicable to other glycoproteins that accumulate at low levels in plants and is currently being explored for a range of other proteins in the Biopharming Research Unit. The project is ongoing with a particular focus on improving the production of the recombinant antigens in plants by improving the folding and humanizing the glycosylation.

M.Sc. Graduates

Fatma Guleid

Supervisor: Dr Jeffrey Dorfman
Co-supervisor: Prof Carolyn Williamson

An effective antibody-based HIV-1 vaccine would ideally elicit potent antibodies capable of neutralising a wide range of HIV-1 isolates to better cover the human population. A primary concern is the virus' ability to rapidly escape an antibody response. A strong neutralising response elicited by a vaccine may, in principle, select for viruses that are highly antibody resistant thereby significantly reducing the benefit of a vaccine. It is therefore important to study and better understand highly neutralisation resistant viruses. Interestingly, very highly neutralisation resistant viruses appear under-represented in the population.

We hypothesised that this may be at least partially explained by decreased entry efficiency as changes to Envelope during escape could affect the entry process and provide opposing selective pressure that discourages the appearance of very highly neutralisation-resistant viruses. Therefore, our main aim was to determine if there exists a relationship between neutralisation resistance and entry efficiency in subtype C and CRF02_AG HIV variants.

In contrast to the hypothesis, the highly neutralisation resistant strains displayed increased entry efficiency and therefore this characteristic of neutralisation resistant strains does not explain their low frequency in the population. The secondary aims of my study were to examine genetic characteristics of neutralisation resistant viruses (this was not a novel aspect of the study however), and to determine whether neutralisation resistance affected sensitivity to entry inhibitors and specific bNAbs (thereby revealing which epitopes are driving resistance at a population level).

Finally, our findings suggest that, in the context of an antibody-based intervention, highly resistant viruses with increased entry efficiency circulating in the population could be a setback in the control of the HIV-1 epidemic. Therefore, for any long-term antibody-based intervention to be globally relevant it must elicit responses that limit occurrence of resistance and also increase chances that escape would lead to severely impaired viral fitness.

1st International HPV Awareness Day

The first annual HPV Awareness Day was held in March 2018, with the campaign messages "**HPV affects everyone"** and **"Give love, not HPV"**. UCT, the National Institute for Communicable Diseases (NICD), the Health Promotion South Africa Trust and CANSA organised events focussed on HPV awareness. **Dr Zizipho Mbulawa** was among the representatives for the day and spoke at the HPV awareness campaign at Baphumelele Children Home, Khayelitsha, Cape Town.

The HPV Awareness Day events aimed to raise awareness about the availability of prevention tools, to promote education about HPV, and encourage governments and individuals across the world to take action against HPV to save hundreds of thousands of women and men who could benefit from the HPV vaccine and/or screening for the early detection of cancer. The HPV Awareness Day also aims to establish a basis for communities, schools, clinics, universities and political and patient groups to think about what can be done to help to spread the news and to take action. HPV related cancers can be prevented and this knowledge needs to be spread to all. Everybody needs to be informed and, if adequate, to enrol in a preventive activity that will reduce the risk of developing a cancer associated with HPV.

HPVs are sexually transmitted viruses that are very common worldwide. There are more than 200 different HPV types, 80% of people will have HPV at some point in their lifetime and, while for many it will cause no harm, some types of HPVs are known to cause certain cancers such as cervical, anal and oropharyngeal cancer. Worldwide, cervical cancer is the fourth most frequent cancer in women and an estimated 270,000 women die of cervical cancer every year.

Awards and achievements

Dr Lindi Masson awarded National Institutes of Health (NIH) RO1 grant

Lindi is the Co-Principal Investigator together with Dr Jennifer Deese (FHI 360; pictured below) for a five-year study entitled "Depo Provera and Beyond: Understanding the Impact of Lower Dose Medroxyprogesterone Acetate and Long-Acting Contraceptives on Female Genital Tract Microbiome and Immunology". The team also includes Prof Jonathan Blackburn (Integrative Biomedical Sciences) and researchers at the Virginia Commonwealth University.

Intramuscular depomedroxyprogesterone acetate (DMPA 150mg) is used by over 60 million women globally. Epidemiologic studies suggest that DMPA is associated with increased risk of HIV acquisition. To confirm or disprove this, a pivotal randomized clinical trial (ECHO) is now being conducted. Observational studies have suggested that DMPA causes vaginal microbial and immune changes that in turn increase HIV infection risk.

The Depo Provera and Beyond study will include women enrolled in three randomised controlled hormone contraceptive trials in South Africa and South America that are being led or co-led by FHI 360: 1) ECHO (comparing HIV aquisition among DMPA, levonorgestrel implant, and copper intrauterine device users); 2) Extended Duration of Sayana Press (a low-cost, lower dose subcutaneous form of DMPA); and 3) the Lower Dose DMPA PK/PD study (lower MPA doses - 45, 75 and 105mg). The study will evaluate changes in cytokine and antimicrobial peptides, T cell phenotype and activation and microbial populations (metaproteomics, 16S rRNA sequencing, metagenomic sequencing) in women before and during the use of the above methods of contraception.

Dr Smritee Dabee interviewed by Women's Health magazine

LOWER YOUR RISK OF CONTRACTING HIV

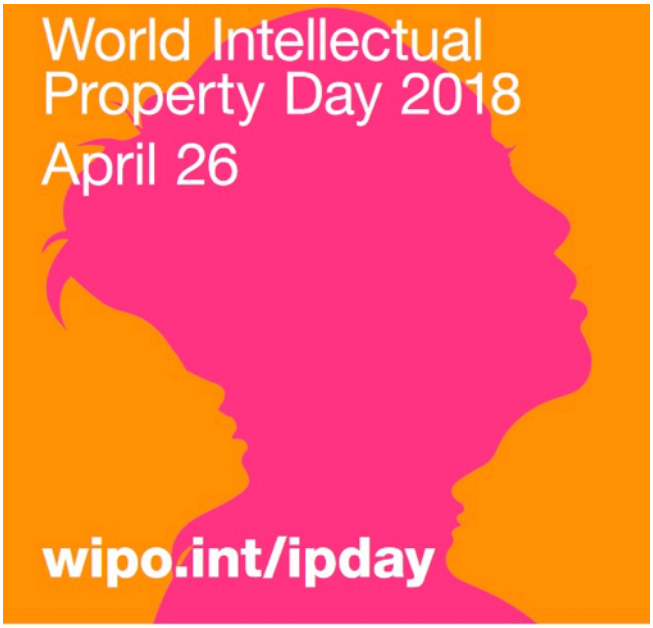
THE SCIENTIST: Dr Smritee Dabee, postdoctoral research fellow at the Division of Medical Virology at the University of Cape Town

Dabee's work looks at one of the buzziest fields in biological science: inflammation – one of the key precursors to disease. And she's investigating how it affects a disease at the forefront of SA's health concerns: HIV.

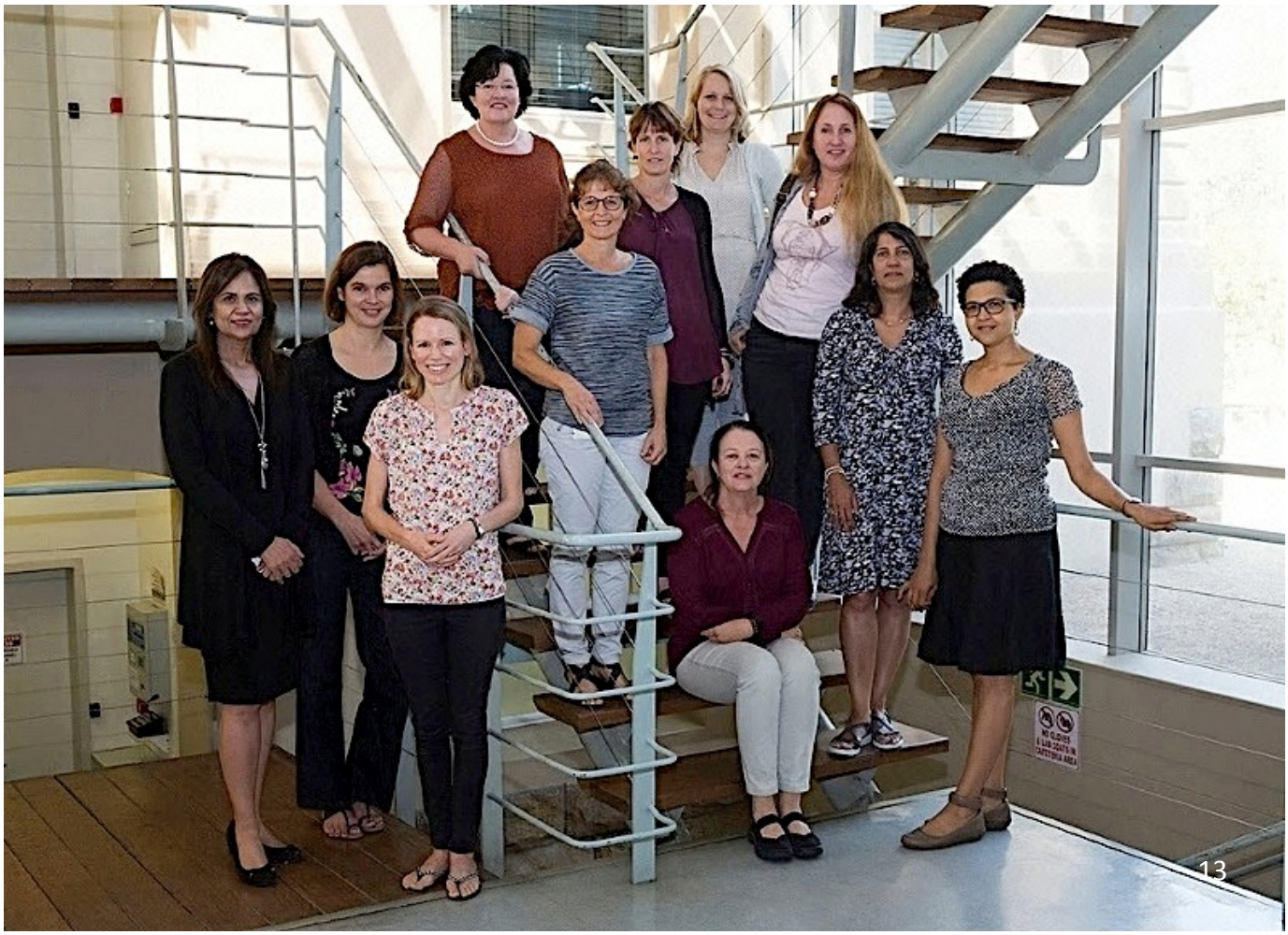
For more about Sim's work, read page 87 of the August issue of Women's Health. Well done, Sim!!

World Intellectual Property Day 2018

Powering change: Women in innovation and creativity



The World Intellectual Property (IP) Day is celebrated annually on the 26th April. This year the theme was "Powering change: Women in innovation and creativity". The World Intellectual Property Organisation selected this theme to recognise and celebrate the contribution of women in driving global change through science, innovation and the arts. UCT Research Contracts and Innovation (RC&I) organised a variety of initiatives to recognise and celebrate the contributions of innovative women at UCT who are powering change in their respective fields. Researchers from the Division of Medical Virology who hold patents are Prof Anna-Lise Williamson, Prof Carolyn Williamson, Dr Nikki Douglas, A/Prof Jo-Ann Passmore and Dr Lindi Masson.



Conferences & Workshops

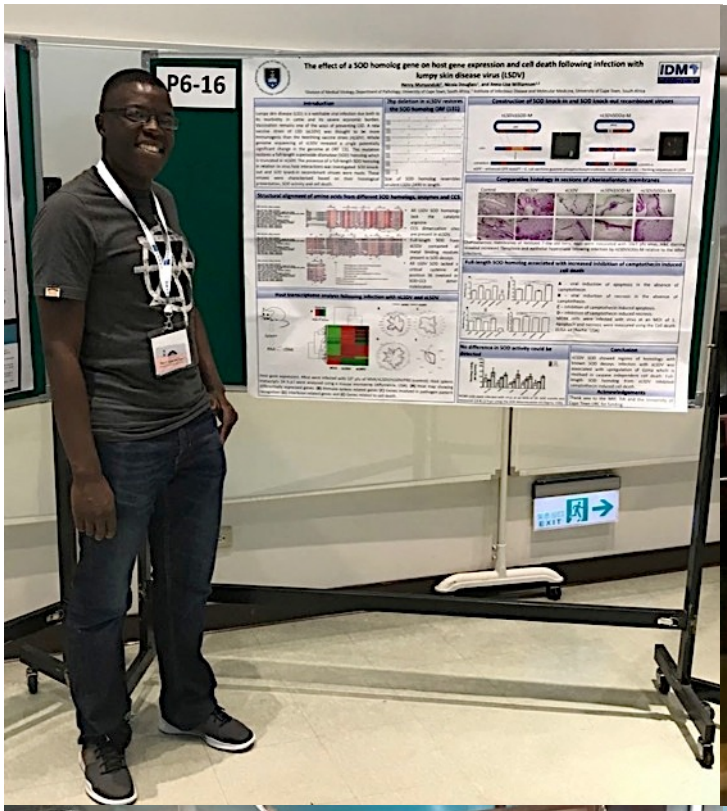
In May, Prof Carolyn Williamson attended the INTERST meeting in Kigali Rwanda, and presented a talk on “HIV Cure”. Known as the “African CROI”, the INTEREST Conference brings together scientists involved in HIV treatment, pathogenesis, and prevention research in Africa to share pivotal findings, promote collaboration, and transfer experiences across several fields and many continents. The conference showcases cutting-edge knowledge in the diagnosis and treatment of HIV and the prevention of HIV infection. Additionally, it fosters building a community of African physicians and scientists to facilitate the implementation of local solutions for the management of patients living with HIV infection and for the prevention of HIV transmisssion.

HVTN SUB-SAHARAN AFRICA REGIONAL MEETING 21-22 FEB 2018

The HIV Vaccine Trials Network (HVTN) Sub-Saharan African Regional Meeting was held in Cape Town in February. Dieter Mielke from UCT presented his work in a session for Early Stage Invesigators in Basic Science, along with Dr Nono Mkhize (NICD), Anneta Naidoo (CHIL), One Dintwe (CHIL), Dr Zanele Ditse (NICD) and Simone Richardson (NICD). All the presentations were of very high standard and generated a lot of discussion.

XXII International Poxvirus, Asfarvirus and Iridovirus Conference

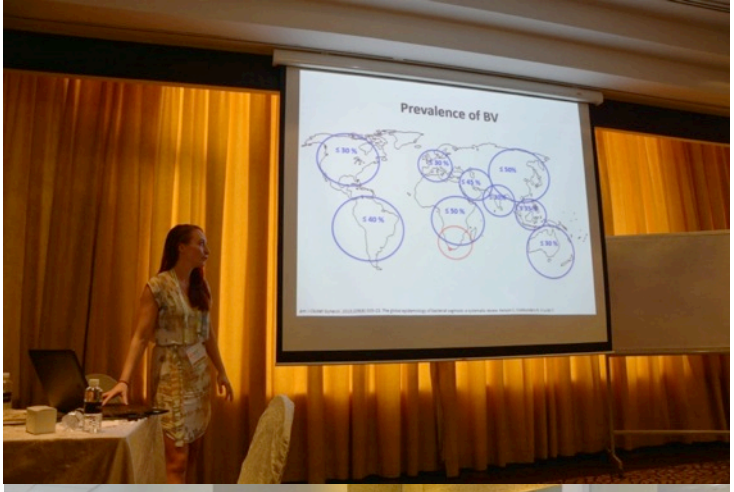
Prof Anna-Lise Williamson, Dr Niki Douglas and Henry Munyanduki attended the XXII International Poxvirus, Asfarvirus and Iridovirus Conference in Taipei, Taiwan in June 2018. Henry presented a poster about “The effect of a SOD homolog gene on host gene expression and cell death following infection with lumpy skin disease virus (LSDV)”.



Two very different probiotics conferences - the "Probiota" conference in Barcelona and the "International symposium of the International Scientific Association of Probiotics and Prebiotics" in Singapore.

The Probiota conference took place in Barcelona, Spain from 7-9th February, and brought together business, science and academia to translate scientific discovery into commercial advantage. My abstract was selected as the highest-rated abstract, and I gave an oral presentation entitled "Vaginal versus commercially available *Lactobacillus* strains for vaginal health". However, the emphasis of this conference was not basic research but the probiotic industry and consumer behaviour, which was reflected in the topics of the talks.

I also attended the International Symposium of the International Scientific Association of Probiotics and Prebiotics (ISAPP) in Singapore from 4-7 June, where I had a poster presentation about antibiotic resistance profiles of vaginal *Lactobacillus* strains with probiotic characteristics. In addition I gave a knowledge exchange seminar, discussing the potential of probiotics to improve vaginal health in South African women. ISAPP is the only scientific organization dedicated specifically to probiotics and prebiotics, bringing together scientists from all pertinent disciplines, including food science, microbiology, immunology, biochemistry, nutrition and medicine, and therefore presenters were mostly academics compared to the Probiota conference. We also visisted Danone, and it was interesting to get insights into probiotic research in industry. Despite being so different, both conferences broadened my horizon, improved my knowledge, and helped to establish contacts with international scientists and the industry. **–Anna Happel**



Drs Ruby Bunjun and Smritee Dabee participated in this year's Pint of Science. Pint of Science is a global festival that takes places in pubs around the world simultaneously. Expert speakers give short talks in the relaxed setting of a pub to showcase the exciting world of scientific discovery. Smritee gave a stimulating, educational talk about STDs and their link with HIV among young people, and about how educating young women can make a difference. Ruby's informative and often humorous talk focused on how understanding immunity to chlamydia would contribute to vaccine design which would ultimately reduce the burden of both chlamydia and HIV. The event was sold out and both talks were extremely well-received.

STDs and inflammation: Finding the chink in HIV's armour – Dr Smritee Dabee

More than three decades into vaccine research and prevention strategies, HIV prevention is still one of the major health challenges in South Africa. Adolescent girls and young women are the most vulnerable to infection, and are about 3 times more likely to be HIV-positive compared to men their age. However, it is becoming increasingly evident that this cannot completely be explained by social behaviour and that there must be biological factors at play. Sexually transmitted diseases (STDs) and other reproductive infections are common among young men and women and are responsible for increasing a person's risk of HIV infection. It turns out that factors that cause inflammation in the genital tract could put a woman at a higher risk of HIV. Knowing that, what we can do about it? Sex education and learning about your own body can have a major impact. South Africans do have the tools to fight HIV!

HIV's new BFF - Dr Ruby Bunjun

Sub-Saharan Africa bears the brunt of the HIV pandemic, with the highest burden of disease worldwide. Recently, inflammation in the female genital tract has been shown to increase HIV risk in young women by more than 3-fold. *Chlamydia trachomatis* is a common cause of this inflammation and is highly prevalent worldwide, including South Africa. In addition to increasing HIV risk, chlamydia is also associated with adverse reproductive outcomes, including infertility and pelvic inflammatory disease. There is currently no vaccine for chlamydia. Understanding the nitty-gritty of how chlamydia causes disease and contributes to HIV risk is vital for vaccine development. A vaccine against chlamydia would not only decrease the number of chlamydia infections, but also contribute to lowering the number of HIV cases.

Progress and Pathways Toward an Effective HIV Vaccine

Dr Ros Chapman attended the Keystone in Banff, Alberta Canada in January/ February 2018. The HIV prevention field is in a phase of rapid growth and innovation for new vaccine strategies that hold promise for efficacy. Emerging, novel findings were the focus of this meeting, and included: 1) Technological advances in structural properties of the HIV-1 envelope glycoprotein and its interactions with potent neutralizing antibodies; 2) Improved animal model platforms that can better mimic the transmitted founder HIV-1 strains and human immune recognition; 3) Greater understanding of host B and T cell immunobiology in the lymphoid germinal centers that is critical to optimize candidate vaccines and immunization regimens; 4) New tools for interrogating human immune repertoire; and 5) highlights of promising strategies in first in human to efficacy studies.

HIV/TB Immunology & Pathogenesis Group

Team Building Function 2018

Farewells

Phillippe Selhorst graduated in 2003 from the Karel de Grote-Hogeschool as a high school teacher in physics, biology, and mathematics. However, he immediately continued his studies starting a Masters in Biology at the University of Antwerp where he specialized in physiology and biochemistry. In 2007 he was awarded a Ph.D. scholarship from the Research Foundation Flanders (FWO) to carry out research on HIV microbicides at the virology unit of the Institute of Tropical Medicine, Antwerp. Obtaining his Ph.D. in 2012, he was interested in contributing to HIV research in South Africa, and started a short-term fellowship to work in the HIV Diversity Group of Prof Carolyn Williamson, UCT to grow HIV viruses. He stayed for more than five years working and collaborating on many studies such as CAPRISA004 and AMP. He was instrumental in obtaining an NIH-U01 grant on HIV+ kidney transplants and together with Carolyn and Carina, drove the virology of this study. Although he loved SA, he has now left UCT in order to experience the private sector, working for CD3-CISTIM, a small molecule drug discovery company in Leuven, Belgium, where he'll manage the infectious disease projects.

Celia Rademayer

I have been part of the Diversity Group for the last 9 years. As a Senior Scientific Officer in the HIV-1 Diversity and Pathogenesis Group, I conducted research as part of the HVTN503 study which characterized breakthrough HIV-1 infections in the South African Phambili vaccine efficacy trial. I further managed the CAVD project (Collaboration for AIDS vaccine discovery) which aimed to characterize southern African clade C HIV-1 and its phenotypic properties in acute/early infection. Most of my time was spent on this last project which also allowed us to further investigate the prediction and determination of target sites in polyclonal serum responses. After much deliberation, I have decided to take a break from science for a year or two as it was becoming increasingly difficult to juggle home life responsibilities and the demands of work. Presently, I am taking a more active role in our business and have taken up teaching pottery, something I have long dreamed of. These new responsibilities allow for the flexibility I sought. I will no doubt miss science, Carolyn, and the amazing colleagues and staff that I shared the last 9 years with, but this is most definitely not “goodbye”, but rather, “until we meet again”.

High impact publications

Genital inflammation undermines the effectiveness of tenofovir gel in preventing HIV acquisition in women

Lyle R McKinnon[1–3,9], Lenine J Liebenberg[1,3,9], Nonhlanhla Yende-Zuma[1], Derseree Archary[1,3], Sinaye Ngcapu[1,3], Aida Sivro[1–3], Nico Nagelkerke[2], Jose Gerardo Garcia Lerma[4], Angela D Kashuba[5], **Lindi Masson**[1,6], Leila E Mansoor[1], Quarraisha Abdool Karim[1,7], Salim S Abdool Karim[1,7] & **Jo-Ann S Passmore**[1,6,8]

Several clinical trials have demonstrated that antiretroviral (ARV) drugs taken as pre-exposure prophylaxis (PrEP) can prevent HIV infection1, with the magnitude of protection ranging from −49 to 86% (refs. 2–11). Although these divergent outcomes are thought to be due primarily to differences in product adherence[12], biological factors likely contribute[13]. Despite selective recruitment of higher-risk participants for prevention trials, HIV risk is heterogeneous even within higher-risk groups14–16. To determine whether this heterogeneity could influence patient outcomes following PrEP, we undertook a post hoc prospective analysis of results from the CAPRISA 004 trial for 1% tenofovir gel (n = 774 patients), one of the first trials to demonstrate protection against HIV infection. Concentrations of nine proinflammatory cytokines were measured in cervicovaginal lavages at >2,000 visits, and a graduated cytokine score was used to define genital inflammation. In women without genital inflammation, tenofovir was 57% protective against HIV (95% confidence interval (CI): 7–80%) but was 3% protective (95% CI: −104–54%) if genital inflammation was present. Among women who highly adhered to the gel, tenofovir protection was 75% (95% CI: 25–92%) in women without inflammation compared to −10% (95% CI: −184–57%) in women with inflammation. Immunological predictors of HIV risk may modify the effectiveness of tools for HIV prevention; reducing genital inflammation in women may augment HIV prevention efforts.

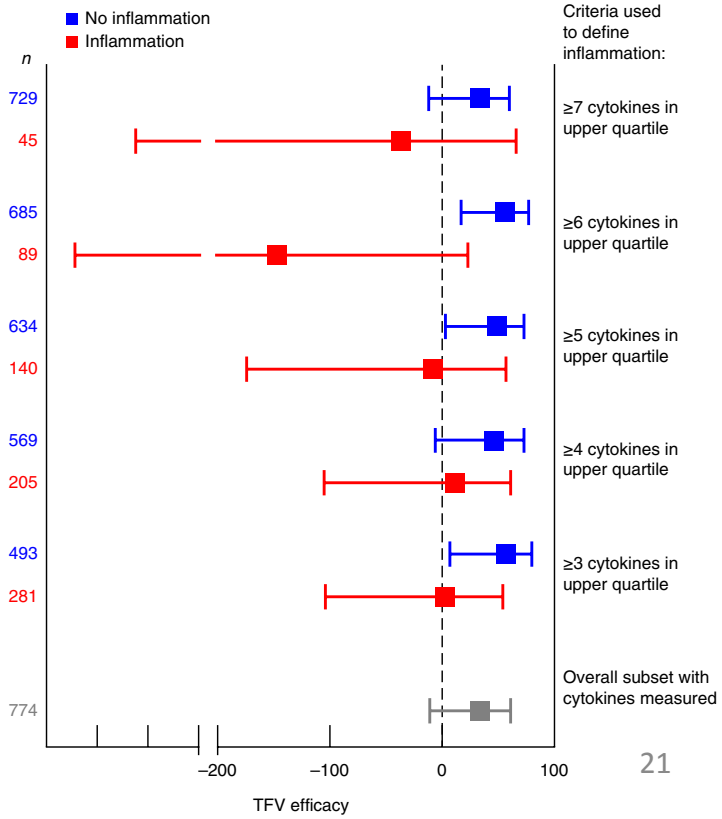
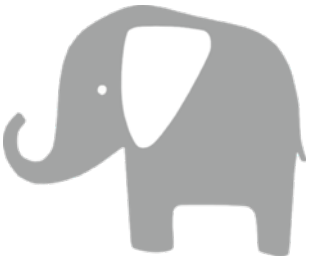


Figure 1 Tenofovir efficacy in groups stratified according to level of inflammation, defined as a specified number of cytokines detected at elevated concentrations in FGT secretions (n = 774 women). Tenofovir efficacy estimates (red boxes) and 95% CIs (whiskers) for groups meeting the indicated cut-offs for inflammation. Data for those falling below the indicated cut-off are represented with blue boxes and whiskers. Tenofovir efficacy is measured along the x axis, and the dotted black line indicates 0% efficacy. The gray box and whiskers show the overall tenofovir efficacy for all participants included in this analysis.

Getting to know the Virology team with 6 quick questions



Sherazaan Ismail

What's the most interesting thing about you that we wouldn't learn from your CV?

I was a qualified lifeguard

What is the funniest thing that has happened to you recently?

Not really funny- but I went for a run one night and when I got home found that my boyfriend had locked us out of the apartment. We have a high security lock on our front door that needed to be removed carefully because it cant be picked so we called a locksmith. He arrived after having had a couple beers. On top of that, the motor for the gate to the building just stopped working. Needless to say it made for an interesting evening in the cold- improvising and trying to get a drunk locksmith to break into our building/flat.

You've been given an elephant. You can't give it away or sell it. What would you do with the elephant?

I'd go swimming with it (please do yourself a favour and google 'swimming elephants')

What would your autobiography be called?

I told you so

A penguin walks through that door right now wearing a sombrero.

What does he say and why is he here?

Pengiun to Sherazaan: 'Why am I here?'

Narrator: 'He's here because she's had too much tequila'

How would you describe your job to a child?

Once upon a time, scientists discovered these tiny little mean monsters that were making people really sick. The scientists found medicine that would make the people feel a lot better but all it did was make the monsters go into hiding, so when people don't take their medicine they get sick again. Now, scientists, including me, are trying to solve the mystery of how to make the monsters disappear forever so that people don't have to take medicine every day anymore. (Credit to Dave for giving me the idea for this).

CodeBridge community meetup

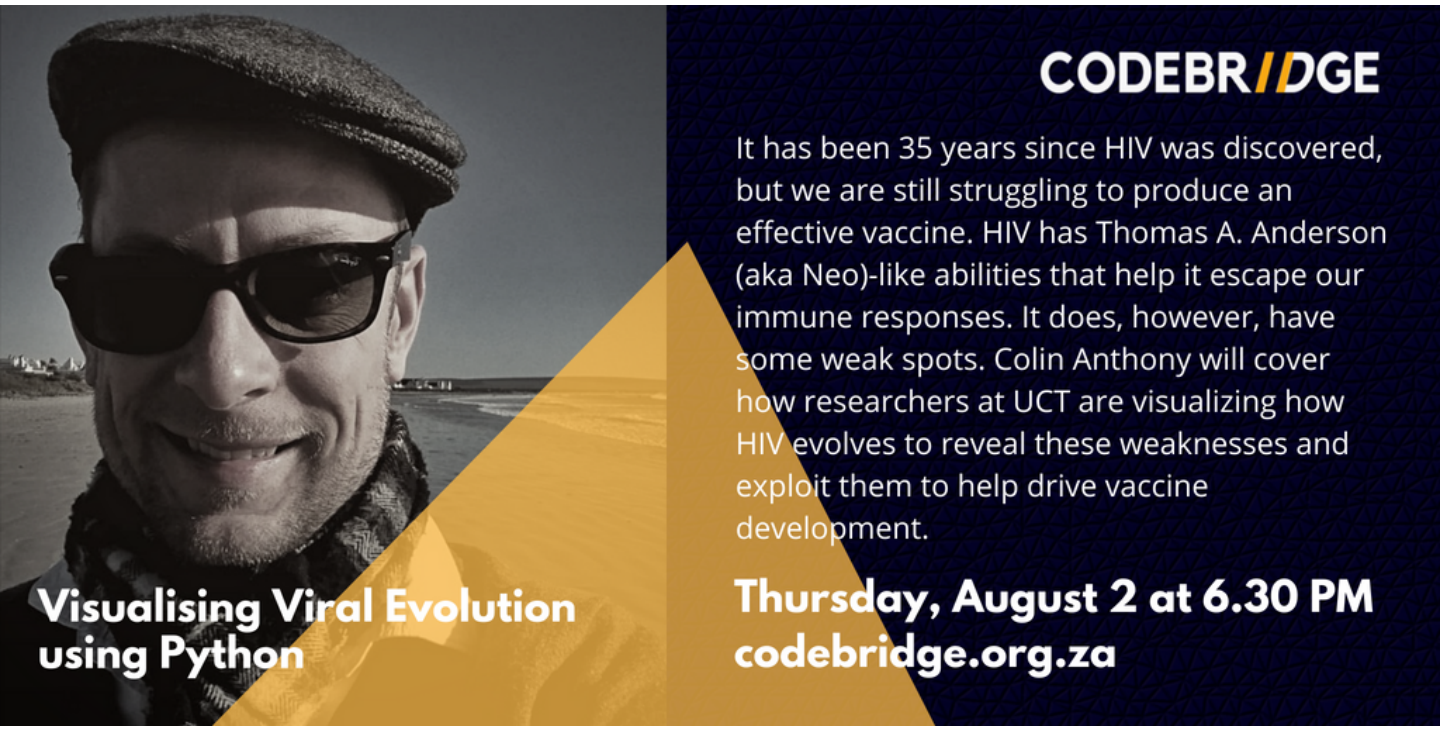
Communicating Science to the public

During July, Dr Colin Anthony attended a “Mandela Day Hackathon” hosted by the CodeBridge/ OpenUP associated meetup group “DataViz”. This involved working on a project to visualize incidence of sexual violence and the resources available to those who experience such trauma (Police stations, Sexual Crimes Courts and shelters for those experiencing sexual violence).

While attending this meetup, Colin was invited to present on his work “Visualizing Viral Evolution” to the DataViz community. This event was attended by a diverse range of people, including software developers, journalists and individuals in the NGO/advocacy space relating to HIV-AIDS.

The talk focused on providing an easily understandable grasp of the biological concepts behind HIV immunity and the research carried within the HIV Diversity Group at UCT, as well as demonstrating how viral evolution can be visualized in intuitive ways.

The talk sparked much interest and has opened the potential for further engagement with the DataViz community for cross-pollination of ideas regarding the visualization of different kinds of data.



Miscellaneous corner

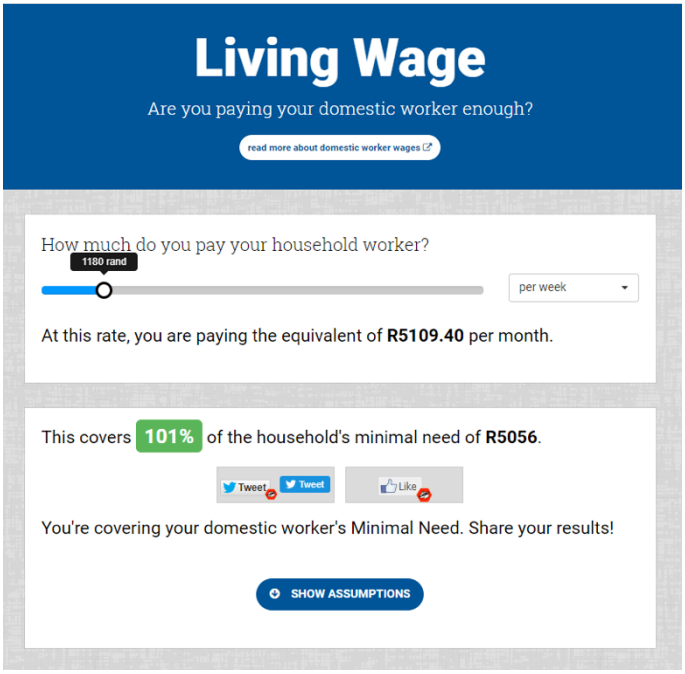
OpenUp: *Making public data accessible to the public*

OpenUp is a public good NGO with the aim of providing people with:
1) information about their situation(s)
2) how change can be achieved and
3) the means to do so,
to enable them to 'take action to improve their lives'.

"We build tools, open up data, and provide training that support active citizenry and help communities and government work together."

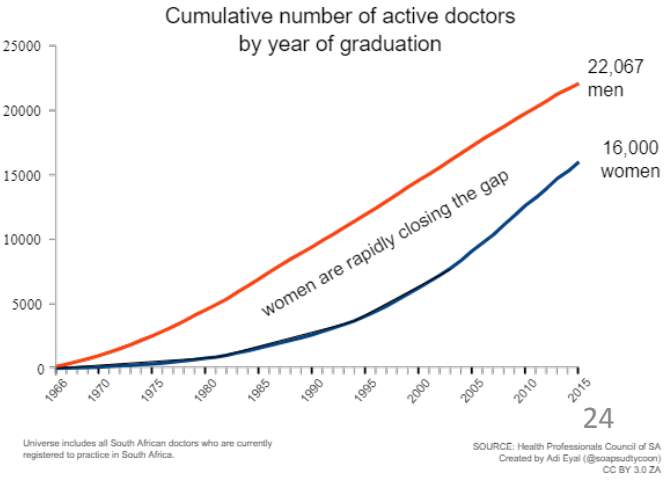
Minimum wage vs. a living wage

The minimum wage for a domestic worker in 2018 was recently set at R20/hr, but what is a real living wage for an average domestic worker in South Africa? I imagine that many people would not be able to answer this question on the spot.
OpenUp (also previously known as Code4SA) have a great article about this: http://living-wage.co.za/.
They also have a handy living wage calculator, for those who employ a domestic worker, to show what percentage of a living wage one is currently paying (http://livingwage.code4sa.org/)



Women in Medicine

The 9th of August is National Women's Day, a good time to reflect on the status of women in the medical field. It is very exciting to see that the number of women in medicine has increased significantly!
Female medical doctors on the rise!
https://openup.org.za/articles/interesting-explorations-of-the-medical-profession.html



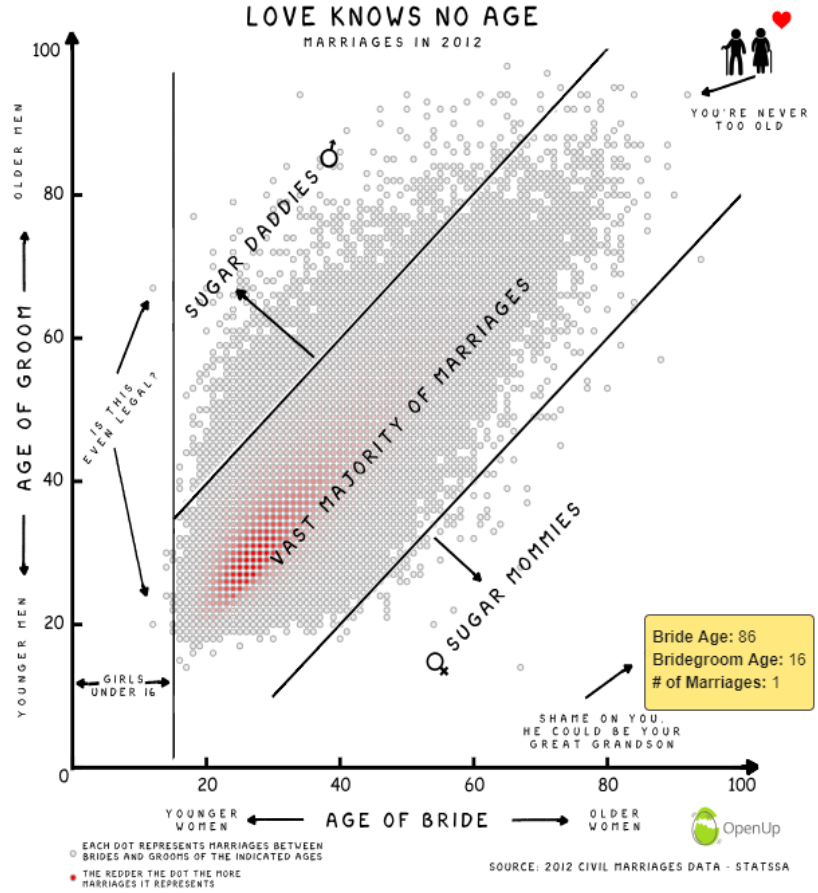
Miscellaneous corner

OpenUp: *Making public data accessible to the public*

Love and marriage... and age
Relationships are a significant part of our daily lives.
Finding a life partner is something that many people desire, but for many, this is not an easy feat!

A popular talking point, with respect to romantic relationships, is the age of the two people involved.

Some people claim that age is just a number, while others feel strongly about age differences.
In South Africa, who is getting married to whom?
From this analysis of civil marriages (2012), it looks like love and age have a very flexible relationship!
(See the full article at https://openup.org.za/articles/valentines-day.html)



For more interesting articles on topics such as "Why Africa is larger than maps cause us to think it is", "Directors in SA, by race", "Tenders by government department", "Age and gender balance in the 2016 local government election" and more, see https://openup.org.za/visualisations/

Miscellaneous corner

Cape Town Tunnel tour:

If you are looking for something fun/brave/ interesting to do in Cape Town...read on!

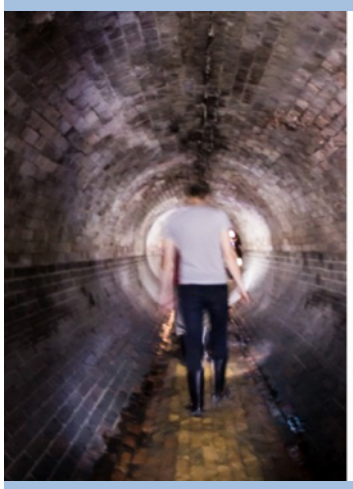
In case you didn't know, there is a network of tunnels and canals under the city of Cape Town CDB.

These canals were originally designed to deliver fresh water to the Company Gardens and passing ships, but after they became polluted, they were closed off, and many years on, they have mostly been forgotten.

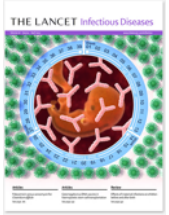
Today, they pipe stormwater, mountain run-off and fresh spring water into the ocean (I guess it is possible that some of this water could end up in the desalination plant at the waterfront, oh well).

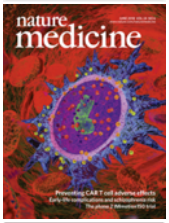
Regardless, **Good Hope Adventures** offer guided tours of these canals. We are planning on organizing a group to do this tour in the summer, so please let us know if you are keen to join.

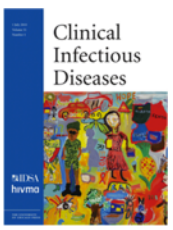
Details:
The tour takes about 2-3 hours and you would need to be able to climb a 3m high vertical ladder (to get in and out) and costs R250 per person (minimum of 6 people required).
You can read more about the tour here:
https://www.capetownmagazine.com/cape-towns-underground-tunnels
and here:
http://www.goodhopeadventures.com/tour-tunnel-adventure.htm



Publications (February - August 2018)







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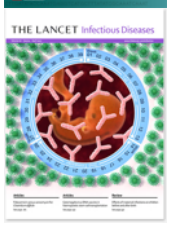

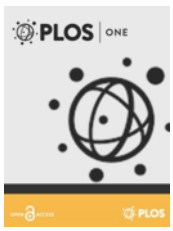

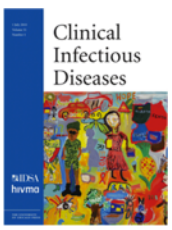

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