VIROLOGY MATTERS

FEBRUARY 2018

Photo credit: Robyn Walker

Prof. CAROLYN WILLIAMSON awarded SAMRC Gold Medal

South African Medical Research Council Gold medals are awarded annually to established senior scientists who have made seminal scientific contributions that have impacted on the health of people, especially those living in developing countries. Carolyn's research aims to inform vaccine design. She has made significant contributions to understanding the molecular mechanisms of HIV transmission, and to illuminating the characteristics of the transmitted virus. Her work demonstrates how these characteristics influence both the risk of infection and disease progression; and she has been involved in developing and testing candidate HIV vaccines. Carolyn is also a research associate of the Centre for the AIDS Programme of Research in South Africa (CAPRISA).

Other highlights

- Prof. Anna-Lise Williamson elected onto the Executive Board of the International Society for Vaccines
- Dr. Zizipho Mbulawa rated Y2 by the NRF
- Dr. Dieter Mielke and Dr. Godfrey Dzhivhuho received their PhDs
- Anna Happel received the Colin Kaplan Award for 2017
- Dr. Ramla Tanko received the Faculty of Health Sciences Best Publication award

Awards and Achievements

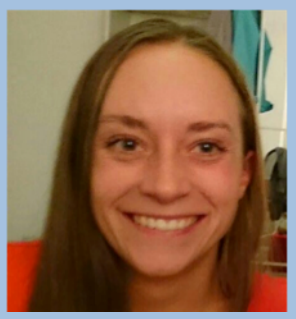
ISV Executive Board and NRF SARCHi Chair

Prof. Anna-Lise Williamson has been elected onto the Executive Board of the International Society for Vaccines (ISV). ISV aims to encourage, establish and promote the development and use of vaccines to prevent and control infectious and non-infectious diseases in humans and animals as well as to develop a professional and academic society devoted to all aspects of vaccines. Prof. Williamson's SARCHi Chair in Medical Virology has been renewed for a 5 year term. Her original chair commencement date was in 2008. The renewal followed in-depth assessments by the NRF through a two-phase peer-review process.

NRF Rating

Dr. Zizipho Mbulawa has been rated Y2 by the NRF. A Y2 rating is given to a young researcher who is recognised as having the potential to establish him/herself as a researcher.

Colin Kaplan Award



Anna Happel received the Colin Kaplan Award for the young investigator in Virology who has made the greatest impact. Anna published two probiotics manuscripts in 2017, has received Medicines Control Council approval to run a clinical trial on the use of Vagiforte® Plus probiotic for treatment of bacterial vaginosis (BV) and has evaluated novel probiotic *Lactobacillus* spp. candidates for treating BV.

Faculty of Health Sciences Best Paper Award

Dr. Ramla Tanko received the Best Paper Award in the Postgraduate Basic Laboratory Sciences category. Her publication entitled "Effect of antiretroviral therapy on the memory and activation profile of B cells in HIV-infected African women" was published in 2016 in the Journal of Immunology (198(3):1220-8).

College of Medicine Exam (CMSA) II

Dr. Nokwazi Nkosi and **Dr. Annabel Enoch** passed the CMSA II exam, that is required, together with the MMed, to become a Pathologist.

Carnegie Corporation Emerging Academic Leaders

Dr. Lindi Masson received the Carnegie award for female genital tract metaproteomics and metabolomics studies that she is conducting to improve our understanding of risk factors for HIV acquisition and adverse reproductive outcomes. Lindi has also been appointed as an Associate Member of the IDM.

Ph.D. Graduates

Dr. Godfrey Azwindini Dzhivhuho

Thesis Title: An investigation of the impact of parasitic worm infection on the immunogenicity of candidate HIV vaccines
Supervisor: Dr. Gerald Chege
Co-Supervisors: Prof Anna-Lise Williamson and Dr. William Horsnell

Chronic parasitic worm infections are thought to reduce the efficacy of vaccines. Given that HIV and worm infections are common in sub-Saharan Africa (SSA) and their geographical distribution vastly overlaps, it is likely that future HIV vaccines in SSA will be administered to a large proportion of people with chronic worm infections. Godfrey Dzhivhuho's thesis examined the impact of parasitic worm infections on the capacity of candidate HIV vaccines to elicit effective immune responses. He demonstrated that infected individuals respond poorly to HIV vaccination and elimination of worms by 'deworming' confers only partial restoration of normal immune responses to vaccination. He further showed that effective HIV vaccines could potentially worsen worm-associated pathology when given to infected individuals. These novel findings will likely guide further research in HIV vaccines and future vaccination policies regarding the current clinical vaccines and future HIV vaccination with respect to parasitic worm infections especially in SSA. **–Dr. Godfrey Dzhivhuho**

Ph.D. Graduates

Dr. Dieter Mielke

Thesis Title: The impact of Neutralizing and ADCC Responses on HIV-1 Envelope Evolution in Early Infection
Supervisor: Prof. Carolyn Williamson
Co-Supervisor: Dr. Colin Anthony

The development of an effective HIV-1 vaccine remains a global priority. Neutralizing antibodies (nAbs), which block infection by cell-free virus, are likely to be an important response for vaccines to elicit. However, evidence from the RV144 vaccine trial and non-human primate vaccine studies suggest antibody-dependent cellular cytotoxicity (ADCC) responses, which target virus-infected cells, may also be protective. This thesis used deep sequencing, together with immune assays, to characterise HIV-1 Envelope evolution associated with both nAb and ADCC responses in early infection, and investigated broadly neutralizing and non-neutralizing monoclonal antibody ADCC activity against subtype C viruses.

Recent advances in deep sequencing approaches enabled us to generate thousands of viral sequences to accurately track viral population dynamics in early infection. In all participants, there was a significant drop in the relative frequency of wildtype (WT) virus following nAb responses. However, in 3/7 participants, when controlling for changes in viral load (VL) over time, we observed that the WT load remained relatively stable despite an effective nAb response. Instead, there was an outgrowth of the escaped virus with a concomitant increase in VL. We found that nAbs were inefficient at blocking cell-cell transmission of early WT and escape viruses, identifying this as one mechanism by which viruses may persist despite the presence of nAbs. These results suggest that other antibody effector functions such as ADCC, which target infected cells, may be important to elicit in protective HIV-1 vaccines.

If ADCC responses are important in controlling viral populations, one would expect to find evidence of viral escape from these responses. In all nine participants investigated, we found ADCC responses emerged prior to nAb responses, and in three individuals we observed sequence changes prior to detectable nAbs. To evaluate if these changes were due to ADCC pressure on the virus, we introduced select mutations into infectious molecular clones encoding the cognate early/acute *envelope* (Env-IMCs). In one participant, the mutation introduced conferred resistance to both nAb and ADCC responses, while in two participants, mutations were identified which resulted in resistance to ADCC but had no effect on neutralization, suggesting escape from ADCC. Longitudinal analysis in one of these participants, which targeted the CD4-binding site, revealed three distinct escape pathways, of which two conferred resistance to ADCC, and confirmed that ADCC responses can directly drive viral evolution *in vivo*.

Finally, we investigated the ADCC activity of eleven anti-HIV-1 monoclonal antibodies (mAbs), including seven broadly neutralizing antibodies (bnAbs) and four non-neutralizing antibodies (nnAbs), against a panel of nine acute subtype C Env-IMCs. We found bnAbs had low….

Continued on page 5

Ph.D. Graduates

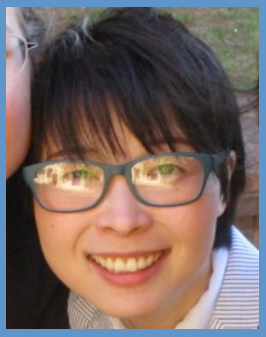
Dieter Mielke continued

to moderate ADCC breadth (11-66%). In contrast, while the two V2 nnAbs we tested were narrow and weak, the two nnAbs targeting CD4-induced epitopes (A32 and C11) mediated the broadest (78-100%) and most potent (0.06-0.81 µg/mL) ADCC against this panel. In addition, a non-linear relationship was found between ADCC activity and strength of mAb binding to the infected cell surface.

In conclusion, we found that the WT load remained relatively stable following early nAb pressure, albeit at lower relative frequency than the escape variant. Evasion of antibody responses through cell-cell transmission may contribute to the persistence of WT virus, providing further motivation for the importance of antibody effector functions that target infected cells in a protective HIV-1 vaccine. For the first time, we provide evidence of ADCC-mediated immune pressure in early infection, showing that these responses can exert selective pressure on HIV-1. However, the limited number of sequence changes relative to those observed following nAb pressure suggests that this response does not put as much selective pressure on the virus as nAbs. Lastly, the moderate breadth of bnAb ADCC activity provides evidence that there are common epitopes on free virions and on the surface of infected cells. This indicates bnAbs with potent and broad ADCC should be identified to include in antibody-based treatment and cure strategies, which aim to eliminate infected cells. Altogether, these data suggest that while eliciting nAbs should be the primary goal of HIV-1 vaccine design, ADCC-mediating antibodies may also play an important role. **–Dr. Dieter Mielke**

Honours Graduates

Akiko Suzuki



Thesis title: Characterisation of next generation DNA and modified vaccinia Ankara (MVA) vaccines expressing HIV-1 subtype C mosaic antigens

Supervisors: Prof. Anna-Lise Williamson and Dr. Ros Chapman
Co-supervisor: Michiel van Diepen

I'm from Japan and obtained my undergrad degree in Biological Sciences and Molecular and Cell Biology at UCT. My Honours project was to characterise MVA and DNA vaccines designed by a former PhD student, Tsungai Jongwe, and a current PhD student, Phindile Ximba. The recombinant MVA (rMVA) was designed to express subtype C mosaic Gag and Env antigens. Three high titre stocks of rMVA were prepared by the propagation of the rMVA in RK-13 cells. The Gag and Env sequences in the viral DNA were confirmed by PCR and protein expression was detected by Western blotting and immunofluorescence. Zera plasmid DNA expressing PBs containing Env protein was used to construct Zera plasmid DNA without tissue plasminogen activator (TPA) leader sequence and KDEL endoplasmic reticulum retention sequence to compare the effects of TPA and KDEL on expression and localisation of Zera-induced PBs. Construction of the correct plasmid DNA was confirmed by restriction digestion analyses and *in vitro* protein expression was detected by immunofluorescence.
-**Akiko Suzuki**

Honours Graduates

Andrea Gillian Abrahams

Project Title: Vaginal *Lactobacillus* activity against bacterial vaginosis-associated bacteria in the female genital tract

Supervisor: Dr. Lindi Masson
Co-supervisor: Monalisa Manhanzva

My project involved testing clinical lactobacilli against a common bacterial vaginosis (BV) associated bacteria - *Gardnerella vaginalis*. A healthy vaginal microbiome is dominated by lactobacilli, while outgrowth of other pathogenic anaerobic bacteria results in a state of dysbiosis known as BV. BV causes inflammation in the female genital tract and is associated with increased risk of HIV acquisition and adverse reproductive health outcomes.

I determined the ability of clinical *Lactobacillus* isolates to inhibit the growth of *G. vaginalis* and the possible mechanisms used for inhibition. The ability of the *Lactobacillus* isolates to competitively adhere to epithelial cells of the female genital tract was also investigated. In addition, the inflammatory responses elicited from ectocervical cells by varying bacterial stimulation, were determined. I found that 4/6 of the *Lactobacillus* isolates included in my project inhibited *G. vaginalis* growth and this inhibition was associated with lactate production and low pH. I also found that the *Lactobacillus* isolates were able to suppress inflammatory responses to *G. vaginalis*.

Thus, my project identified clinical *Lactobacillus* isolates that are possible probiotic candidates. These probiotics can be used as adjunct treatment to provide improved treatment for BV, reducing the risk of HIV acquisition. -**Andrea Gillian Abrahams**

Nina Radzey

Thesis title:
Characterization of clinical *Escherichia coli* strains from the genital tracts of South African women

Supervisor: Assoc. Prof. Jo-Ann Passmore
Co-supervisors: Dr. Shameem Jaumdally and Anna Happel

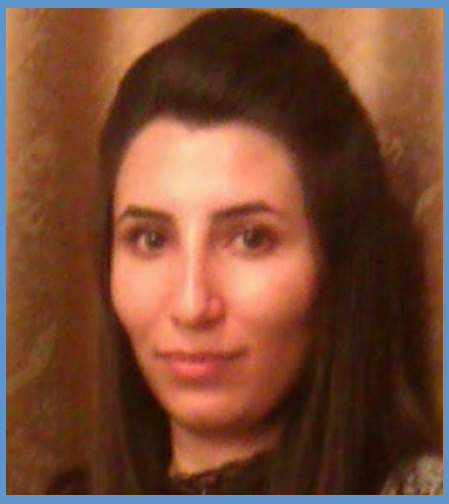
My honours project focused on the isolation and characterization of *Escherichia coli* strains obtained from the genital tracts of South African women. To this day, *E. coli* remains the leading causative agent of urinary tract infections (UTIs), a leading contributor to morbidity and health care expenditures in persons of all ages globally.

E. coli strains were initially isolated from lateral vaginal wall swabs obtained through the uCHOOSE study. The basis of this study was the hypothesis that uropathogenic *E. coli* originally reside in the gut and migrate up the urinary tract via the vagina. A combination of host susceptibility factors and pathogenicity/virulence of the microbes was investigated, including the impact of STIs/BV status, adhesion capacity, cytokine production, phage specificity and antibiotic susceptibility.

Women with STIs were at significantly greater risk (9X) of being *E. coli* carriers. Adhesion to Ca Ski (cervical epithelial) cells and cytokine production differed across the 11 isolates tested. Antimicrobial susceptibility assays revealed that most isolates were susceptible to Ciprofloxacin, the current antibiotic of choice, and all were resistant to Amoxicillin, the agent previously recommended. **–Nina Radzey**

New Postgrads

Dr Arghavan Alisoltanidehkordi has expertise in computational biology and genetic studies. She completed her PhD in plant molecular genetics at Shahrekord University, Iran. She was a postdoctoral fellow at the Vaal University of Technology for one year and has now joined the Division of Medical Virology as a postdoc in Dr. Lindi Masson's research group. She has a strong background in biostatistics and bioinformatics and will be involved in developing a female genital tract metaproteomics data analysis pipeline.



Rofhiwa Nesamari I am a PhD student in Assoc. Prof. Wendy Burgers' group. I completed my BSc in Microbiology at UCT in 2009 and thereafter I did a BSc honours at the University of Pretoria. After my honours degree I worked as an NRF/DST intern at a radiopharmaceutical company (NTP Radioisotopes) in NECSA. My MSc work was in the plant pathology field, titled Diseases and Pests of *Encephalartos* species in South Africa, and I completed this under the supervision of Prof. Jolanda Roux in FABI (Forestry and Agricultural Biotechnology Institute) at the University of Pretoria. My current PhD study is on Th22 CD4+ cells and their role in fungal and mycobacterial infections.

Bahiah Meyers My background is in HIV research, having completed my BSc (Biochemistry, Genetics) in 2013 and my Honours (Molecular and Cell Biology) and Masters (Medical Biochemistry) under the supervision of Dr Zenda Woodman (Dept. of Integrative Biomedical Sciences) working on the characterisation of subtype B Envelope glycoprotein transmission motifs and its potential impact on subtype C viral fitness. My PhD project with Dr. Lindi Masson will focus on the validation of a point-of-care device for the detection of sexually transmitted infections (STIs) and dysbiosis in South African women. After completing my PhD, I hope to stay in research and lecture as I am passionate about teaching science.

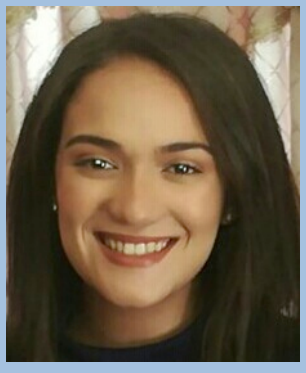
New Postgrads

Zandile Booi I am a master's student in Assoc. Prof. Wendy Burgers' group and my project is focused on investigating cytokine responses to different *Mycobacterium tuberculosis* strains and antigens. I completed my honours in Human Genetics at UCT and my project was based on "Investigating the genetic basis of familial Arrhythmogenic Right Ventricular Cardiomyopathy". Prior to this, I did my BSc in Medical Bioscience at the University of the Western Cape in 2016.

Akiko Suzuki will be staying in Prof. Anna-Lise Williamson's group to do her Masters degree. She will be supervised by Anna-Lise and Dr. Niki Douglas. Her project will be aimed at developing a lumpy skin disease virus (LSDV)-bovine leukemia virus (BLV) vaccine for cattle.

Nina Radzey has joined Dr. Lindi Masson's group as a master's student. She will investigate the differences in vaginal metaproteomic profiles of adolescents versus adults. The goal of her project will be to improve our understanding of the elevated levels of genital inflammation and high rates of HIV infection seen in young South African women.

Andrea Gillian Abrahams will be staying in Dr. Lindi Masson's group to complete her master's degree. She'll be investigating the mechanisms by which lactobacilli alter inflammatory responses to pathogenic bacteria using *in vitro* models and transcriptomics. She'll also investigate how certain dysbiotic bacteria suppress chemokine responses and whether this facilitates their persistence in the female genital tract.



New Staff

Lynn Tyers completed her BSc in Molecular Biology and Biotechnology at Stellenbosch University in 2013. Thereafter she moved to the Faculty of Health Sciences, UCT and obtained her BSc (Med) Honours in Human Genetics (2014) and her MSc (Med) in Human Genetics (2016). She worked at LASEC as a Data Administrator for 9 months, prior to joining Prof. Carolyn Williamson's group as a Scientific Officer.

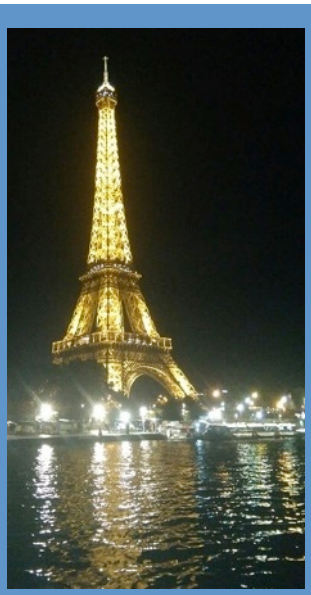
Conferences & Workshops

International Society for Vaccines Annual Congress

This year I attended ISV2017 in Paris together with Prof. Anna-Lise Williamson. The program was a tad top heavy and had a lot of representatives from (big) pharma. Therefore the talks were mainly overviews and a bit light on specifics. However, there seems to be quite a lot of progress on a Zika vaccine with every Tom, Dick and Harry being able to make effective vaccines from pretty much any platform (DNA, VLPs, MVA, live-attenuated virus). There are concerns though that all these flavivirus vaccines could lead to vaccine antibody enhanced infections as has been seen for Dengvaxia in dengue infection.

With regard to vaccine platforms, the new kid on the block is replicating RNA vaccines. Everybody involved was very excited about it, you know what scientists can be like. The word is that in contrast to replicating DNA vaccines, these vaccines can both decrease dose and increase immunogenicity, hooray!

Overall I found the poster sessions the most useful, I got some connections and protocols for my own work through that. Furthermore, MabTech was there and speaking to them, I learned that they are developing some tools for rabbit immunogenicity which will be very useful for our HIV-1 vaccine research as the main model is in bunnies. We will be testing their IFNgamma ELISPOT soon. Furthermore, some new vaccine delivery devices are hitting the market which show increased immunogenicity of DNA, viral or protein to normal injection. For DNA for instance, one study showed equal immunogenicity compared to electroporation. So this might be worth investigating for our HIV-1 subtype C vaccine.



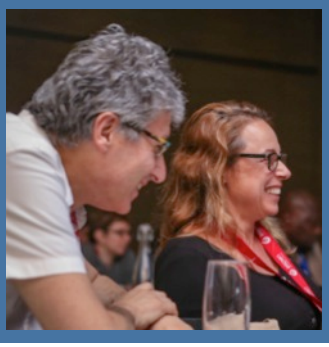
Lastly, on the second night we had a very nice conference dinner on a boat cruising along the Seine. I think I was almost the only one who spotted this cool structure near the riverbank. So the next day I did some research into it and appears to be called 'Le Pointy Needle' by the locals, very apt seeing this when at a vaccine conference! Apparently, it is the largest matchstick structure in the world and explains the world matches shortage in the early noughties. It was allegedly built by MTN for cell phone coverage of the whole Africa, which finally explains the terrible reception I get with my phone. **-Michiel van Diepen**

8th Annual HIV Prevention Workshop

Prof. Carolyn Williamson, Assoc. Profs Wendy Burgers and Jo-Ann Passmore, Drs Melissa-Rose Abrahams and Lindi Masson attended the 8th Annual HIV Prevention Workshop. The Workshop, that was hosted by CAPRISA, the Ragon Institute, and the HIV Pathogenesis Programme, was held in the KwaZulu-Natal Midlands from 14-17 November. The exciting meeting focused on advances in HIV pre-exposure prophylaxis, vaginal microbiome, immunogenetics of HIV disease, broadly neutralising antibodies, HIV vaccine and cure research.

7th Federation of Infectious Diseases Societies in Southern Africa (FIDSSA) Congress

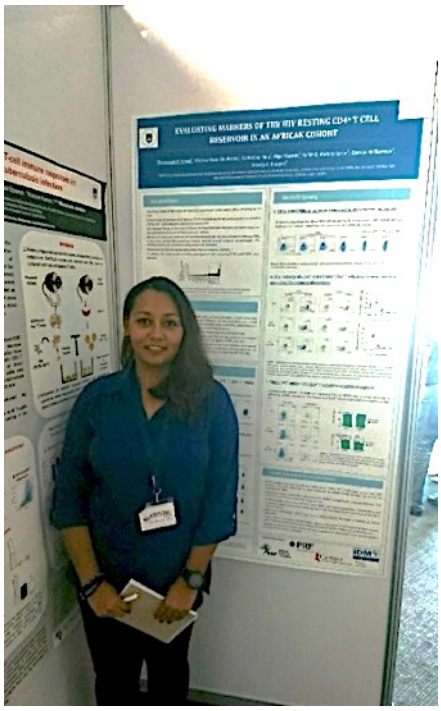
Assoc. Prof. Jo-Ann Passmore and Dr. Lindi Masson were part of the scientific organising committee for the 2017 FIDSSA Congress, held in Cape Town. They organised a well-received session entitled "The alarming STI epidemic in South Africa: Can we improve current management strategies?" and the "Maternal Infections" session. Their invited speakers included Prof. Jacques Ravel from the University of Maryland, Prof. Nuala McGrath from the University of Southampton, and Prof. Quarrhaisha Abdool Karim from CAPRISA. Monalisa Manhanzva attended the meeting, while Anna Happel's abstract was selected for an oral presentation and she discussed her research around vaginal probiotic development. Lindi also presented and chaired a session.

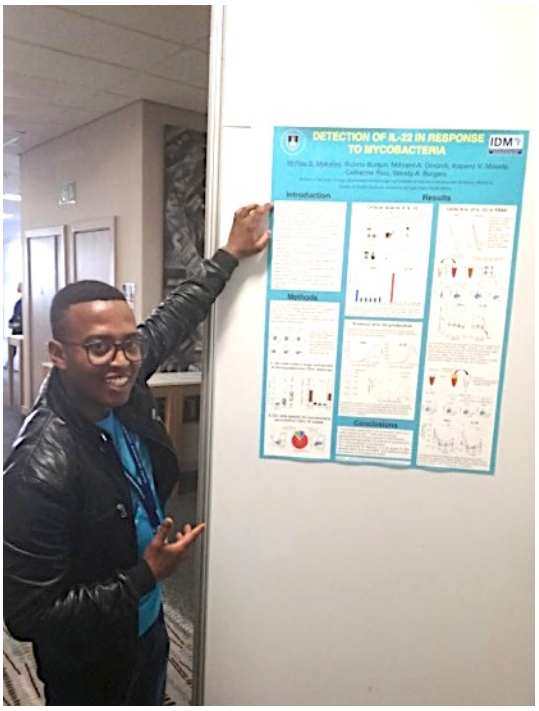


South African Immunology Society (SAIS) Conference

From the 3rd to the 6th of September 2017, **Sherazaan Ismail** presented a poster and **Steven Makatsa** gave a short talk at the 6th SAIS Conference in Gordon's Bay, Cape Town. The conference spanned a wide variety of topics in immunology, including immune tolerance, autoimmunity, TB- and HIV-immunology, vaccine responses, and HIV cure. Conference attendees had the opportunity to meet Mr Timothy Ray Brown, the only person to be functionally cured of HIV. Mr Brown attended all three days of the conference and told his story as the final talk of the conference. The conference was a good opportunity to meet peers in the field of Immunology, and to network with senior researchers from both South Africa and abroad.

In addition, **Steven Makatsa** attended the Immunology Primer and 7th Infectious Diseases in Africa Symposium, also hosted by SAIS, where he presented a poster. **Dr. Lindi Masson** also attended the workshop and presented about the female genital tract microbiome. The mandate of the meetings was to teach attendees about immune evasion strategies in HIV, TB, and malaria. Furthermore, this symposium emphasized networking amongst young scientists to create a stronger network for the next generation of African immunologists across the continent. -**Sherazaan Ismail & Steven Makatsa**





16th European AIDS conference

I attended the 16th European AIDS conference in Milan, Italy from October 25-27th and presented a poster based work done towards my MSc. The main focus of the conference was pre- and post-exposure prophylaxis and assessing European treatment guidelines. The most interesting talks at the conference for me were the talks on long term remission and curing HIV. There was also a particularly interesting talk on HIV testing in the UK by Emma Devitt (entitled "The Dean Street Model Testing"). It was interesting to see the differences in the HIV epidemic, and also responses to the epidemic by public health systems, between African countries and European countries. I took some time off around the conference dates to explore a bit of Italy. The highlight of my visit was being able to explore the Vatican City. **-Sherazaan Ismail**

WISHing for Wellness

Assoc. Prof. Jo-Ann Passmore's group, in the Division of Medical Virology, received a Social Engagement Grant from the Wellcome Trust, for a project called "WISHing for Wellness". The project culminated in a two-week exhibition in the IDM and is currently being exhibited at Fish Hoek Library.

The project involved working intensively with twenty 16-22 year old women from Masiphumelele to explore their perceptions and practices around their sexual reproductive health in order to understand some of the barriers to good sexual health and facilitators of sexual health. Using an integrated arts approach, WISHing for Wellness created a platform for these young women to engage with biomedical research, learning about sexually transmitted infections. The aim of the project was to employ participatory arts-based methods to create a safe space for women's empowerment and co-creation of new attitudes and practices to sexual and health needs, such that they begin to "wish for wellness". All the girls worked and created together, they received constant input from UCT and the programme facilitators. The culmination was the exhibition of the work, using art, drama and science to which the broader community have been invited in the hope of passing this message along. **–Kathryn Norman**

Visitors

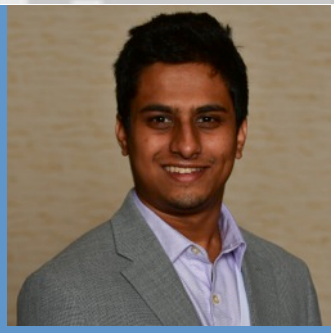
Timothy Ray Brown visited the Medical School on the 11th September. During his visit he met with researchers in the Division of Medical Virology and Immunology.

Mr Brown (born 1966) is an American considered to be the first person cured of HIV/AIDS. Mr Brown was diagnosed with HIV in 1995 while studying in Berlin, Germany, giving him the nickname The Berlin Patient.

In 2007, Mr Brown underwent a hematopoietic stem cell transplantation to treat leukemia (performed by a team of doctors in Berlin, Germany). They selected a donor who was [CCR5]-Δ32 homozygous (which confers resistance to HIV infection by blocking attachment of HIV to the cell). The transplant was repeated a year later after a leukemia relapse.

Over the three years after the initial transplant, and despite discontinuing antiretroviral therapy, HIV has remained undetectable in Mr Brown's blood and in various biopsies. Levels of HIV-specific antibodies in Brown's blood also declined, suggesting that functional HIV may have been eliminated from his body.

Siddhant Prabhu



visited the Division of Medical Virology for a 3-month internship (Sep - Nov 2017) hosted by Dr Lindi Masson and Associate Prof Jo-Ann Passmore.

Siddhant is a master's student at Northwestern University in the US, majoring in Biotechnology with a certificate in Sustainability at Global Health. His research is focused on combining biology and chemistry for healthcare applications, and he has worked on projects ranging from development of drug delivery systems, to producing pharmaceuticals using metabolic engineering.

During his internship at UCT, Siddhant performed a techno-econcomic analysis on the Genital Inflammation Test that Jo-Ann and Lindi are developing with the aim of identifying the technical and commercialization challenges for developing new healthcare technologies in South Africa. Siddhant has global exposure and has worked in both start-up and large companies, and he aims to use this experience to make an impact in the healthcare industry.

Divisional End of Year Function 2017

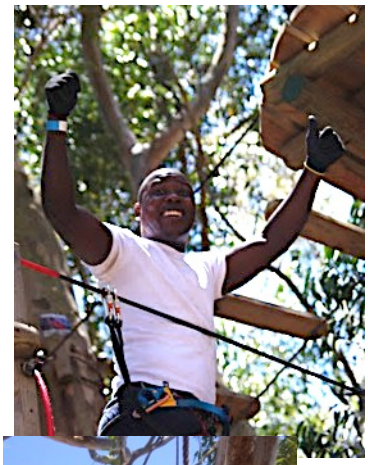
Congratulations to the Best Player, Dieter, the Intermediate winner, Danny, and to the Beginners winner, Akiko!

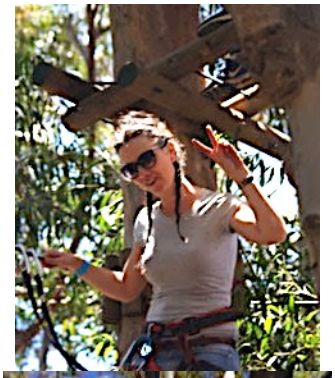
Thank you to Alltalents, Warren and Mani for organising a fun event!!

Genital Mucosal STI/HIV Group

End of Year Function 2017

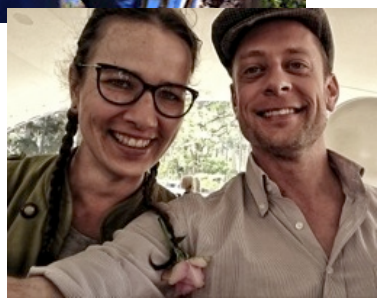
Fun times at Harbour House with lots of fun pressies!





The HIV Diversity Group bids farewell to Debbie Stewart





Farewells

Debbie Stewart has retired

Debbie grew up in Durban. She completed her degree in Biological Sciences followed by Honours in Immunology and Animal Behaviour. She went to London in 1975 and worked as an immunologist on Hepatitis B. After her family moved to Harare in 1982, Debbie worked in the Physiology Department at the University of Zimbabwe where she also did her MPhil on HIV. She then trained Medical Laboratory Scientists before returning to South Africa in 1997 when she settled in Cape Town. Initially she worked at Tygerberg on TB before joining Prof Anna-Lise Williamson working on HPV. During this time, she did a UCT course in project management. She was then employed by Prof Carolyn Williamson as Project Coordinator for the HIV Diversity Group where she was an extremely valued member for about 11 years ago.

Thank you to Debbie Stewart for launching and compiling the Virology Matters newsletter for over 5 years!!

Dr. Gerald Chege is "moving jobs but not really leaving"

Gerald is "leaving" UCT at the end of February 2018 to take up a new appointment as a Specialist Scientist at the Primate Unit of the SAMRC. But a farewell party is actually not on the cards because Gerald has also accepted a nomination as an Honorary Research Associate (HRA) of the Division of Virology, Department of Pathology. As an HRA, he hopes to continue his research association with the Division and the people he has become so fond of. In addition, he hopes to continue serving as member of the Divisional Academic Committee and to avail himself as an academic mentor.

Gerald joined the Division of Medical Virology in 2000 as a PhD student under the mentorship of Profs Anna-Lise Williamson and Enid Shephard. He joined the academic staff of the Division in 2007 after completing his PhD studies. Before coming to South Africa, Gerald worked for 9 years as a biomedical research scientist at the Institute of Primate Research in Nairobi, Kenya. He graduated from the University of Nairobi with a bachelor's degree in Veterinary Medicine and a MSc in Animal Physiology.

We wish you both all the very best for your future endeavors!

Publications (July 2017 - January 2018)

1. Anthony C, York T, Bekker V, Matten D, Selhorst P, Ferreria RC, Garrett NJ, Karim SS, Morris L, Wood NT, Moore PL, Williamson C. Cooperation between strain-specific and broadly neutralizing responses limited viral escape and prolonged the exposure of the broadly neutralizing epitope. Journal of virology. 2017 Sep 15;91(18):e00828-17.

2. Barnabas SL, Dabee S, Passmore JA, Jaspan HB, Lewis DA, Jaumdally SZ, Gamieldien H, Masson L, Muller E, Maseko VD, Mkhize N, Mbulawa Z, Williamson AL, Gray CM, Hope TJ, Chiodi F, Dietrich J, Gray G, Bekker LG, for the Women's Initiative in Sexual Health (WISH) study team. Converging epidemics of sexually transmitted infections and bacterial vaginosis in southern African female adolescents at risk of HIV. International journal of STD & AIDS. 2017 Jan 1:0956462417740487.

3. Bunjun R, Riou C, Soares AP, Thawer N, Müller TL, Kiravu A, Ginbot Z, Oni T, Goliath R, Kalsdorf B, von Groote-Bidlingmaier F. Effect of HIV on the Frequency and Number of Mycobacterium tuberculosis–Specific CD4+ T Cells in Blood and Airways During Latent M. tuberculosis Infection. The Journal of infectious diseases. 2017 Oct 5;216(12):1550-60.

4. Carulei O, Douglass N, Williamson AL. Comparative analysis of avian poxvirus genomes, including a novel poxvirus from lesser flamingos (Phoenicopterus minor), highlights the lack of conservation of the central region. BMC genomics. 2017 Dec;18(1):947.

5. Dylla L, Abar B, Williamson AL, Meiring TL, Bekker LG, Adler DH. Human papillomavirus clustering patterns among HIV-infected and HIV-uninfected adolescent females in South Africa. Journal of AIDS and HIV Research. 2017 Oct 31;9(10):202-6.

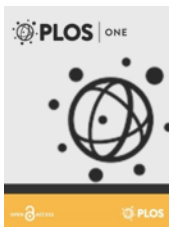
6. Firnhaber C, Swarts A, Goeieman B, Rakhombe N, Mulongo M, Williamson AL, Michelow P, Ramotshela S, Faesen M, Levin S, Wilkin T. Cryotherapy Reduces Progression of Cervical Intraepithelial Neoplasia Grade 1 in South African HIV-Infected Women: A Randomized, Controlled Trial. Journal of Acquired Immune Deficiency Syndromes. 2017 Dec 15;76(5):532-8.

7. Goeieman BJ, Firnhaber CS, Jong E, Michelow P, Kegorilwe P, Swarts A, Williamson AL, Allan B, Smith JS, Wilkin TJ. Prevalence of anal HPV and anal dysplasia in HIV-infected women from Johannesburg, South Africa. Journal of Acquired Immune Deficiency Syndromes. 2017 Jul 1;75(3):e59-64.

8. Happel AU, Jaumdally SZ, Pidwell T, Cornelius T, Jaspan HB, Froissart R, Barnabas SL, Passmore JA. Probiotics for vaginal health in South Africa: what is on retailers' shelves?. BMC women's health. 2017 Dec;17(1):7.

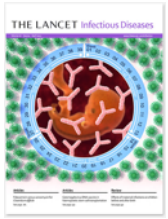
9. Hardie DR, Korsman SN, Hsiao NY, Morobadi MD, Vawda S, Goedhals D. Contamination with HIV antibody may be responsible for false positive results in specimens tested on automated platforms running HIV 4th generation assays in a region of high HIV prevalence. PloS one. 2017 Jul 31;12(7):e0182167.

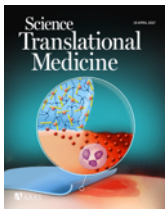
Publications (July 2017 - January 2018)

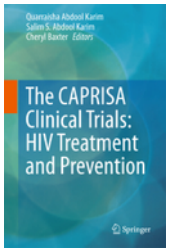


10. Hraber P, Rademeyer C, Williamson C, Seaman MS, Gottardo R, Tang H, Greene K, Gao H, LaBranche C, Mascola JR, Morris L, Montefiori DC, Korber B. Panels of HIV-1 subtype C Env reference strains for standardized neutralization assessments. Journal of virology. 2017 Oct 1;91(19):e00991-17.
11. Hsiao NY, Zerbe A, Phillips TK, Myer L, Abrams EJ. Misdiagnosed HIV infection in pregnant women initiating universal ART in South Africa. Journal of the International AIDS Society. 2017 Aug 1;20(S6).
12. Jaumdally SZ, Picton A, Tiemessen CT, Paximadis M, Jaspan HB, Gamieldien H, Masson L, Coetzee D, Williamson AL, Little F, Gumbi PP, Passmore JS. CCR5 expression, haplotype and immune activation in protection from infection in HIV-exposed uninfected individuals in HIV serodiscordant relationships. Immunology. 2017 Aug 1.
13. Karim A, Salim S, Passmore JA, Baxter C. The microbiome and HIV prevention strategies in women. Current Opinion in HIV and AIDS. 2018 Jan 1;13(1):81-7. Aug 1.
14. Lennard K, Dabee S, Barnabas SL, Havyarimana E, Blakney A, Jaumdally SZ, Botha G, Mkhize NN, Bekker LG, Lewis DA, Gray G. Mulder N, Passmore JS, and Jaspan HB. Microbial Composition Predicts Genital Tract Inflammation and Persistent Bacterial Vaginosis in South African Adolescent Females. Infection and immunity. 2018 Jan 1;86(1):e00410-17.
15. Lennard KS, Dabee S, Barnabas SL, Havyarimana E, Jaumdally SZ, Botha G, Mkhize NN, Bekker LG, Gray G, Mulder N, Passmore JA, Jaspan HB. Hoë voorkomskoers van bakteriële vaginose en Chlamydia in'n lae-inkomste, hoë-bevolkingsdigtheid gemeenskap in Kaapstad. Suid-Afrikaanse Tydskrif vir Natuurwetenskap en Tegnologie. 2017 Dec 12;36(1):10.
16. Mbulawa ZZ, van Schalkwyk C, Hu NC, Meiring TL, Barnabas S, Dabee S, Jaspan H, Kriek JM, Jaumdally SZ, Muller E, Bekker LG. High human papillomavirus (HPV) prevalence in South African adolescents and young women encourages expanded HPV vaccination campaigns. PloS one. 2018 Jan 2;13(1):e0190166.
17. Mbulawa ZZ, Wilkin T, Goeieman BJ, Jong E, Michelow P, Swarts A, Smith JS, Kegorilwe P, Firnhaber CS, Williamson AL. Prevalence of Anal Human Papillomavirus (HPV) and Performance of Cepheid Xpert and Hybrid Capture 2 (hc2) HPV Assays in South African HIV-Infected Women. American journal of clinical pathology. 2017 Aug 1;148(2):148-53.
18. Moosa Y, Tanko RF, Ramsuran V, Singh R, Madzivhandila M, Yende-Zuma N, Abrahams MR, Selhorst P, Gounder K, Moore PL, Williamson C. Case report: mechanisms of HIV elite control in two African women. BMC Infectious Diseases. 2018 Jan;18(1):54.
19. Ngandu NK, Carlson JM, Chopera DR, Ndabambi N, Karim QA, Karim SA, Williamson C. Brief Report: Selection of HIV-1 Variants With Higher Transmission Potential by 1% Tenofovir Gel Microbicide. Journal of acquired immune deficiency syndromes (1999). 2017 Sep 1;76(1):43.

Publications (July 2017 - January 2018)

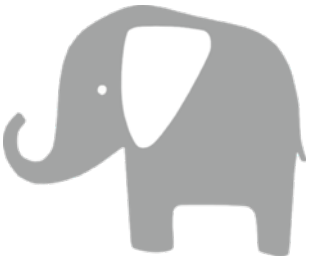






20. Passmore JA, Jaspan HB. Vaginal microbes, inflammation, and HIV risk in African women. The Lancet Infectious Diseases. 2018 Jan 26.
21. Passmore JA, Liebenberg LL, Mkhize NN, Archary D, Masson L. Advancing Understanding of HIV Infection in Women Through Mucosal Immunology Studies. In The CAPRISA Clinical Trials: HIV Treatment and Prevention 2017 (pp. 153-166). Springer, Cham.
22. Regnard GL, de Moor WR, Hitzeroth II, Williamson AL, Rybicki EP. Xenogenic rolling-circle replication of a synthetic beak and feather disease virus genomic clone in 293TT mammalian cells and Nicotiana benthamiana. Journal of General Virology. 2017 Sep 9;98(9):2329-38.
23. Riou C, Berkowitz N, Goliath R, Burgers WA, Wilkinson RJ. Analysis of the Phenotype of Mycobacterium tuberculosis-Specific CD4+ T Cells to Discriminate Latent from Active Tuberculosis in HIV-Uninfected and HIV-Infected Individuals. Frontiers in immunology. 2017 Aug 10;8:968.
24. Sharma S, Aralaguppe SG, Abrahams MR, Williamson C, Gray C, Balakrishnan P, Saravanan S, Murugavel KG, Solomon S, Ranga U. The PTAP sequence duplication in HIV-1 subtype C Gag p6 in drug-naive subjects of India and South Africa. BMC infectious diseases. 2017 Dec;17(1):95.
25. Sivro A, Schuetz A, Sheward D, Joag V, Yegorov S, Liebenberg LJ, Yende-Zuma N, Stalker A, Mwatelah RS, Selhorst P, Garrett N, Samsunder N, Balgobin A, Nawaz F, Cicala C, Arthos J, Fauci AS, Anzala AO, Kimani J, Bagaya BS, Kiwanuka N, Williamson C, Kaul R, Passmore JS, Phanuphak N, Ananworanich J, Ansari A, Abdool Karim Q, Abdool Karim SS, McKinnon LR, on behalf of the CAPRISA004 and RV254 study groups. Integrin α4β7 expression on peripheral blood CD4+ T cells predicts HIV acquisition and disease progression outcomes. Science Translational Medicine. 2018 Jan 24;10(425):eaam6354.
26. Smith JS, Sanusi B, Swarts A, Faesen M, Levin S, Goeieman B, Ramotshela S, Rakhombe N, Williamson AL, Michelow P, Omar T, Hudgens MG, Firnhaber C. A randomized clinical trial comparing cervical dysplasia treatment with cryotherapy vs loop electrosurgical excision procedure in HIV-seropositive women from Johannesburg, South Africa. American Journal of Obstetrics & Gynecology. 2017 Aug 1;217(2):183-e1.
27. Strickland N, Müller TL, Berkowitz N, Goliath R, Carrington MN, Wilkinson RJ, Burgers WA, Riou C. Characterization of Mycobacterium tuberculosis–Specific Cells Using MHC Class II Tetramers Reveals Phenotypic Differences Related to HIV Infection and Tuberculosis Disease. The Journal of Immunology. 2017 Oct 1;199(7):2440-50.
28. Williamson C, Morris L, Garrett N, Moore P, Burgers W, Mlisana K. From Bench to Bedside: Lessons from HIV Natural History Cohort Studies. In The CAPRISA Clinical Trials: HIV Treatment and Prevention 2017 (pp. 137-152). Springer, Cham.

Getting to know the Virology team with 6 quick questions



Kathy Norman

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

I have always wanted to race a car around Killarney!!

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

I tripped over a very low barricade …funny and embarrassing lol

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

Yeah! Cheaper transport to work, we are in Africa after all! Embrace it

What would your autobiography be called?

Between a hard place and life….

A penguin walks through that door right now wearing a sombrero. What does he say and why is he here?

Freeze bitches!.. I have a sombrero and I'm not afraid to use it! He's here to use the sombrero.. duh

How would you describe your job to a child?

I help big people work better

Colin Anthony

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

The psychology of human behaviour is my favourite thing in the world and Transactional analysis is my favourite theory within psychology.

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

I recently ate a dried leaf, which had blown onto my lap, I thought it was a nacho (I was eating nachos). It didn't taste great…

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

I'd put it in the room with all the others.

What would your autobiography be called?

"No romance goes unpunished"

A penguin walks through that door right now wearing a sombrero. What does she say and why is she here?

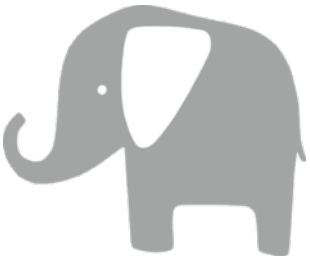
"Colin. We've got to stop meeting like this…" She's my dealer

How would you describe your job to a child?

I spend a lot of time fighting a computer.
Sometimes the computer fights back.
It's tough, but it's great when you win…
Also, I drink mint tea.
That's not strictly part of my job, but it's still very important.

Colin got a cat!

Getting to know the Virology team with 6 quick questions



Ziyaad Valley-Omar

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

Not sure if this is interesting but I've been doing Tai chi for >10 years so I'm Zen AF.

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

Was flung out of a little row boat in the middle of winter on a dam in Ceres because a buddy of mine decided to move to the same side of the boat as me.

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

There is no peak hour traffic when you're rolling to work on an elephant. I'd spare no expense and get it a red bay UCT parking.

What would your autobiography be called?

Hair today gone tomorrow.

A penguin walks through that door right now wearing a sombrero.
What does he say and why is he here?

Penguin: Ola Muchacho, I've come for my money.
He's here to collect the money I borrowed from a Mexican loan shark for PCR primers when the NRF took too long to pay my grant

How would you describe your job to a child?

Answer = Actual conversation with 7 year old:

Daughter: Daddy what do you do for a living?
Me: Well I'm a molecular biologist working on respiratory viruses
Daughter (with a clearly puzzled look): A what?
Me: Ok never mind, I'm a scientist
Daughter (visibly excited): That's so cool!
Do you blow things up?
Me: Only the naughty viruses

Compiled and edited by Lindi Masson (L.Masson@uct.ac.za)
and Colin Anthony (Colin.Anthony@uct.ac.za)