



### Introduction:

The concept behind this newsletter is that anyone with 15 minutes to spare can learn about the work of SATuRN.

The newsletter is presented as a PDF document with links to complete articles at the [bioafrica.net](http://bioafrica.net) website. In this third issue of 2013 our newsletter we focus on our **digital videos activities**.

We have also included interesting news, blogs, reports, tweets, publications and training information produced by our network.

**Produced by:** Tulio de Oliveira, Tobias Rinke de Wit, Justen Manasa, Lungani Ndwandwe, Sonia Boender, Christopher Hoffmann, Raph Hamers, Lynn Morris, Anna Salimo, Jennifer Giandhari & Chris Seebregts

### Highlights:

**Video: HIV & TB drug resistance and clinical management casebook**

**Video & Publication: High-Levels of Acquired Drug Resistance in Adult Patients Failing First-Line Antiretroviral Therapy in a Rural HIV Treatment Programme in KwaZulu-Natal, South Africa.**

**Blog & Publication : Unresolved non-adherence drives early 2nd line ART failure**

**VideoBlog: SATuRN and PASER Scientific Meeting**

**Workshop: 8th Southern African HIV & TB Drug Resistance and Treatment Monitoring Workshop, University of the Free State, Bloemfontein, South Africa, 20-22 Nov 2013**

## Brief: Blogs, reports and news on our work



### Report: SATuRN Collaborates on a Successful Molecular Diagnostics in HIV/AIDS and Tuberculosis in Zimbabwe, 6-9 Aug 2013

Justen Manasa for SATuRN 2013 report, date: 2013-08-21

“The aim of the workshop was to update the participants on the current trends in the application of molecular diagnostic tools in the diagnosis and monitoring of HIV/ AIDS and its co-morbidities in resource limited settings.”

Link: <http://bioafrica.net/report.php?id=21>

### Blog: Data Curation and its tenets

Lungani Ndwandwe, Tulio de Oliveira - 2013-08-15

“SATuRN has developed a cross-national public health and virological research collaboration to implement innovative means of shared data collection, management, analysis, monitoring, and evaluating outcomes in response to ART in resource limited settings“



Link: <http://bioafrica.net/blogs.php?id=28>

### News: New Director named for leading HIV research centre in South Africa

Wellcome Trust - 2013-09-02



“Deenan Pillay, Professor of Virology at UCL (University College London), is today named as the new Director of the Africa Centre for Health and Population Studies, one of the Wellcome Trust's major overseas programmes..”

Link: <http://www.bioafrica.net/news.php?id=81>

### The 8<sup>th</sup> Southern African HIV & TB Drug Resistance & Clinical Management Workshop

The workshop program will follow and expand on the successful format of previous SATuRN and PASER workshops and will include presentations of anti-retroviral (ARV) treatment programs and clinical case management in the developing world, including South Africa, Zambia, Zimbabwe, Uganda, Nigeria, Kenya, Botswana and Brazil. Emphasis will be put on HIV drug resistance. This year, we will continue with the expansion of the workshop to cover TB drug resistance.

### at University of the Free State, Bloemfontein, South Africa, 20-22 November 2013

This year workshop is organized by Southern Africa Treatment and Resistance Network (SATuRN) and the Amsterdam Institute for Global Health and Development (AIGHD) – PASER program.

**Organizers:** Cloete Van Vuuren, Tobias Rinke de Wit, Dewald Stein, Dominique Goedhals, Chris Seebgrets & Tulio de Oliveira

Link: <http://www.bioafrica.net/workshops/8thsaturnPaserresitanceworkshop.html>

## VideoBlog: SATuRN-PASER Scientific Meeting on HIV Drug Resistance in Africa



Twenty-four percent, is the figure that I cannot stop thinking about when we land on Durban International Airport, South Africa. One out of four people living here in the province of KwaZulu-Natal is HIV-infected - a number that goes as high as 48% infection for the women living in the area. The impact of these figures becomes real when I immediately bump into a container providing free condoms at the airports restroom. This place is serious.

We watch the houses scattered through the lush and hilly landscape as we drive to the Africa Center for Health and Population Studies in Mtubatuba. With the PharmAccess Studies to Evaluate Resistance (PASER) scientific team we are here to visit our colleagues of the Southern African Treatment Resistance Network (SATuRN). Both of us are working in the field of HIV drug resistance in sub-Saharan Africa where PASER is monitoring HIV drug resistance from the start of antiretroviral treatment, and SATuRN is monitoring resistance from the moment of treatment failure.

This meeting enables us to share information on expertise, experience, existing resources and capacities, to explore a joint research agenda.

SATuRN director Prof Tulio de Oliveira welcomes us at the Africa Centre and introduces us to its extensive demographic HIV surveillance including resistance testing. Prof Tobias Rinke de Wit explains the context of the PASER observational cohort studies and the PASER scientific output is further explained by Dr Raph Hamers for the adult studies and Dr Kim Sigaloff for the paediatric studies. Dr Pascale Ondo explains the development and validation of affordable resistance testing within the PASER network.

After spending 2,5 days together, we are all very enthusiastic about our collaboration and we found it hard to leave. Fortunately, we will see each other again for the joint workshop on HIV-TB resistance and treatment monitoring in November this year, in Bloemfontein!

**Author:** Sonia Boender, PhD student for PASER

## Videos: SATuRN & BioAfrica YouTube Channel



### Links:

<http://www.bioafrica.net/videos.php>

<http://www.youtube.com/bioafricaSATURN>

In these new sections of the bioafrica.net and YouTube websites, we disseminate videos of our work and its application in everyday life.



### Research into Acquired HIV Drug Resistance in a Rural HIV Treatment Program

Justen Manasa- 2013-09-29

“Interview about a paper that show very high-level of HIV-1 drug resistance in Adults in Hlabisa, rural KZN, South Africa.”

Link: <http://www.bioafrica.net/videos.php?id=5>

### HIV & TB Drug Resistance & Clinical Management Case Book

Tulio de Oliveira – 2013-09-29

“Prof. de Oliveira talks about their HIV & TB Drug Resistance & Clinical Management Case Book”

Link: <http://www.bioafrica.net/videos.php?id=1>



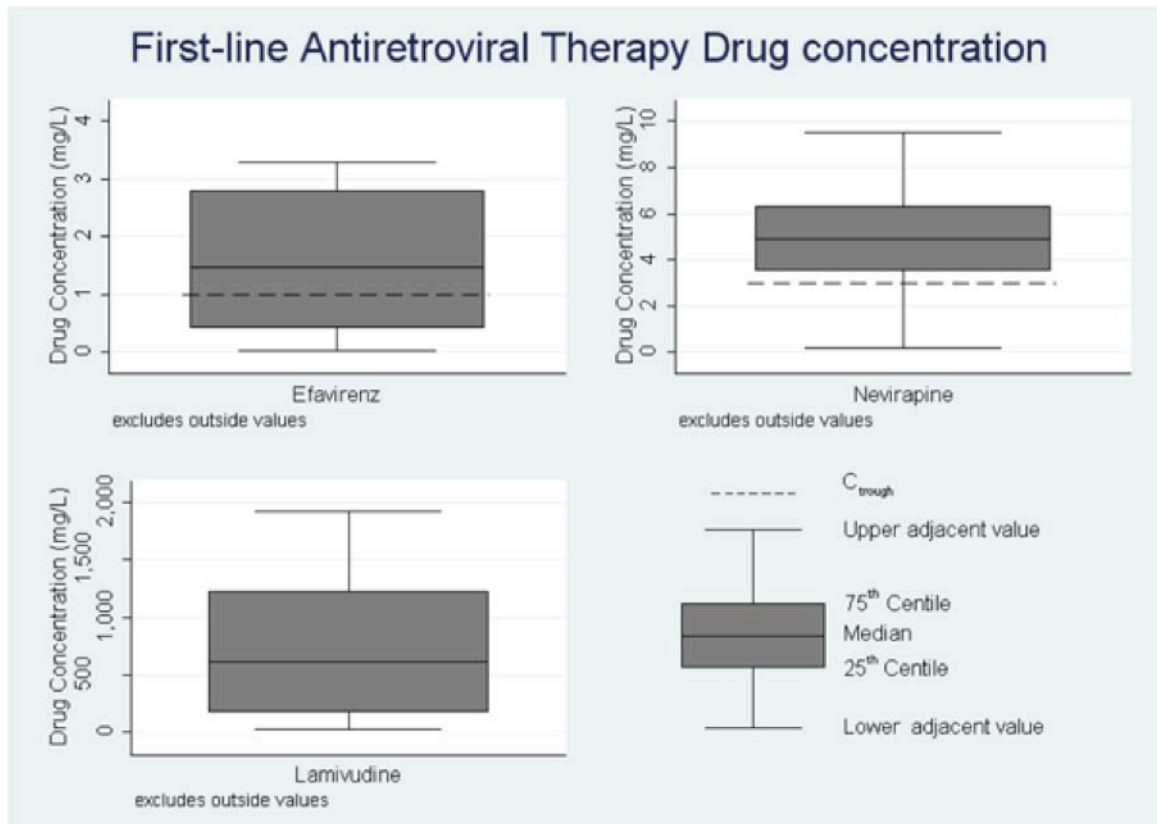
### SATuRN/PASER Scientific Meeting on HIV Drug Resistance in Africa

Authors: Tobias Rinke de Wit, Raph Hamers, Justen Manasa & Sonia Boender - 2013-09-29

“PASER & SATuRN researchers collaborative meeting on HIV-1 drug resistance at Africa Centre, South Africa.”

Link: <http://www.bioafrica.net/videos.php?id=6>

## Blog & Publication: Unresolved non-adherence drives early 2nd line ART failure



Current guidelines for the management of virological failure recommend excluding drug interactions and inter-current infections, intensifying adherence support and switching to second-line ART if a patient remains viraemic. The aim being to ensure that non-adherent patients receive appropriate adherence support and those with resistance switch regimens.

This study highlights that ongoing non-adherence remains a major contributor to first-line virological failure when switching regimens with 55% of patients in this study having sub-therapeutic first-line drug concentrations pre-switch. Perhaps unsurprisingly, these patients were less likely to achieve viral suppression once switched to second-line ART. Furthermore, resistance to NRTIs did not increase risk of first-line failure. In fact, overall patients with resistance did better, perhaps because it reflected a higher degree of adherence.

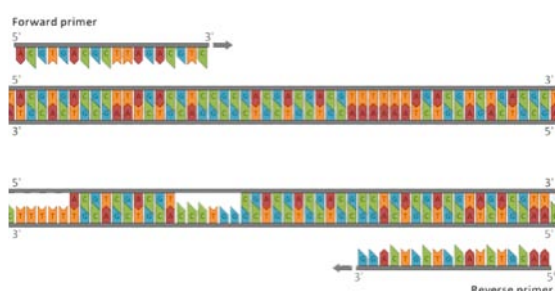
The findings from this study indicate that it is unresolved non-adherence at time of switch, not NRTI resistance, which drives early second-line failure. These findings underline the need to develop simple point-of-care tools for reliably identifying patients in whom non-adherence continues to contribute to viraemia, including options such as simple bio-assays for therapeutic drug levels or other robust measures of adherence.

**Blog by :** Christopher Hoffmann, Aurum Institute & John Hopkins University

**Citation:** Johnston V, Cohen K, Wiesner L, Morris L, Ledwaba J, Fielding KL, Charalambous S, Churchyard G, Phillips A, Grant AD. *J Infect Dis.* 2013 Aug 13. [Epub ahead of print]

**Link:** <http://bioafrica.net/blogs.php?id=27>

## Blog: Simultaneous detection of major HIV-1 drug resistance mutations using a multiplex allele-specific assay



A team of authors have described a method for multiplex allele-specific assay (MAS) for HIV-1 drug resistance mutations. This assay allows for the detection of PI mutations at 5 loci, NRTI mutations at 8 loci and NNRTI mutations at 7 loci associated with resistance to Anti-retroviral drugs used in resource limited settings. Five of the mutation loci had 2 mutations targeted, therefore 2 primers specific to those mutant alleles were designed. The assay included 20 wild-type alleles and 25 mutant alleles, to give a total of 45 primers for the assay.

Mutations like K103N/R, Y181C and M184V are commonly described in South Africa for subtype C viruses, therefore this assay may prove to be useful for surveillance of these and other mutations. However, this assay cannot be used to detect new drug resistance mutations (unknown mutations) and may not be suitable for clinical diagnostics in patient management.

**Blog by:** Anna Salimo, Medical Scientist, Centre for HIV and STIs, National Institute of Communicable Diseases, Johannesburg, South Africa.

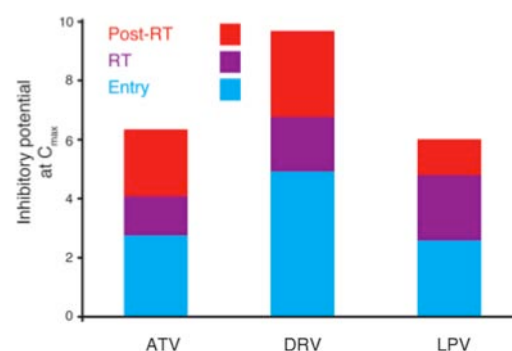
**Link:** <http://www.bioafrica.net/blogs.php?id=30>

**Citation:** Zhang et al. Journal of Clin Micro, 2013, ahead of print.

## Blog: Multi-step inhibition explains HIV-1 Protease inhibitor pharmacodynamics and resistance

Protease inhibitors are highly potent drugs. They are recognized for their high antiviral activity which results from the steep dose-response curves. Resistance to protease inhibitors occurs through mutations in the protease gene; however, many patients who fail protease inhibitor-based therapy do so without mutations in protease. This raises the question: do other parts of the HIV-1 genome contain mutations which confer resistance to protease inhibitors in patients failing therapy?

To understand the molecular mechanisms responsible for the high antiviral activity of protease inhibitors, a group of researchers from John's Hopkins University experimentally tested each relevant step of the life cycle and measured the dose-response curves of three protease



inhibitors (atazanavir, darunavir and lopinavir). Here they found that protease inhibitors do not affect the process of budding, but they do inhibit entry, reverse transcription and post-reverse transcription steps

**Blog by:** Jennifer Giandhari, PhD student, Centre for HIV and STIs, National Institute of Communicable Diseases, Johannesburg, South Africa.

**Link:** <http://www.bioafrica.net/blogs.php?id=31>

**Citation:** Rabi et al. J Clin Invest. 2013;123(9): 3848-3860

**Twitter: SATuRN has a very active twitter account.**



SATuRN collaborators have tweeted at HIV & TB drug resistance events and conferences around the globe.

**We have plans to do twitter coverage of the following conferences, please join us!**

- PARIS, 44rd Union World Conference on Lung Health. 30 October to 3 November 2013
- BLOEMFONTEIN, 8<sup>th</sup> Southern African HIV / TB Drug Resistance & Clinical Management Workshop, 20-24 November 2013
- CAPE TOWN, Emerging Voices for Global Health (EV4GH), School of Public Health (SoPH), University of the Western Cape, 25 November till 13 December 2013
- CAPE TOWN, International Conference on AIDS and STIs in Africa (ICASA), 7-11 December 2013

**SATuRN twitter @drug\_resistance**  
**Please follow us!**

**SATuRN drug\_resistance**

drug\_resistance The business of HIV: Battling the virus | The Economist econ.st/Mb88K0  
3 days ago · reply · retweet · favorite

drug\_resistance Tenofovir Shortages Continue allafrika.com/c/-4Uo1c #southafrica via @allafrika  
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drug\_resistance HIV treatment breaks lead to drug resistance in the female genital tract aidsmap.com/HIV-treatment-...  
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drug\_resistance DoH happy with progress on HIV – almost two million people in South Africa on ART! health-e.org.za/news/article.p...  
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satb2012 Come join us at the 3rd TB Conference in sunny Durban(Durban ICC) from 12–15 June 2012! For more information go to tbconference.co.za.  
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drug\_resistance HIV Mortality Rate Down to 5 Percent allafrika.com/c/-4UJ0E #rwanda via @allafrika  
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drug\_resistance How to manage children exposed to MDR-TB – a tricky issue discussed in LID by our colleagues at LSHTM and Stellenbosch thelancet.com/journals/lanin...  
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## SATuRN's partners featured publications!



### Resistance to tenofovir-based regimens during treatment failure of subtype C HIV-1 in South Africa.

Hoffmann CJ, Ledwaba J, Li JF, Johnston V, Hunt G, Fielding KL, Chaisson RE, Churchyard GJ, Grant AD, Johnson JA, Charalambous S, Morris L. *Antivir Ther.* 2013 Jun 10. doi: 10.3851/IMP2652.



### High-Levels of Acquired Drug Resistance in Adult Patients Failing First-Line Antiretroviral Therapy in a Rural HIV Treatment Programme in KwaZulu-Natal, South Africa.

Manasa J, Lessells RJ, Skingsley A, Naidu KK, Newell M-L, McGrath N, de Oliveira T, *PLoS One* (2013), 8(8):e72152.



### Combined antiretroviral and antituberculosis drug resistance following incarceration.

Stott KE, de Oliveira T, Lessells RJ, *S Afr J HIV Med* (2013), 14(3):135-137.



### Viral suppression following switch to second-line antiretroviral therapy: associations with NRTI resistance and sub-therapeutic drug concentrations prior to switch.

Johnston V, Cohen K, Wiesner L, Morris L, Ledwaba J, Fielding KL, Charalambous S, Churchyard G, Phillips A, Grant AD. *J Infect Dis.* 2013 Aug 13. [Epub ahead of print]

## Training course title, location and date

**Nov 2013**     **8th Southern African HIV / TB Drug Resistance & Clinical Management Workshop**, University of the Free State Medical School, Bloemfontein, **South Africa**, 20-22 November 2013

**Nov-Dec 2013**     **Emerging Voices for Global Health (EV4GH)**, School of Public Health (SoPH), University of the Western Cape, Cape Town, **South Africa**, 25 November till 13 December 2013

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