CAF Central Analytical Facilities
STELLENBOSCH UNIVERSITY

CELL IMAGING UNIT

ISSUE 3

SEPT—DEC 2013

IN THIS ISSUE

WELCOME

Welcome to the third issue of the CAF Cell Imaging Unit Newsletter! We hope you have had a restful holiday and great festive season! As always, the goal of this newsletter is to keep clients informed about the new developments in the unit as well as upcoming training dates. Please feel free to distribute this newsletter to any interested persons. We hope you enjoy this issue!

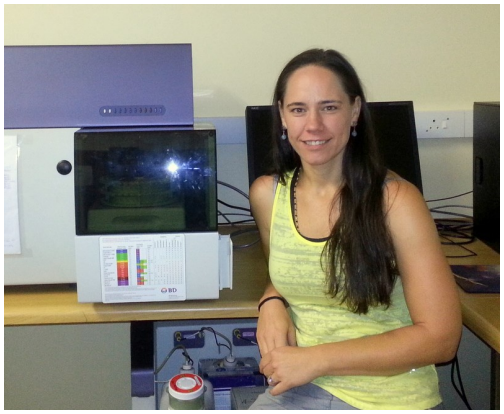
EXCITING NEW DEVELOPMENTS IN 2014!

NEW CAF LITE UNIT AT TYGERBERG MEDICAL CAMPUS

This year we are excited to announce the acquisition of a new CAF flow cytometry unit at the Tygerberg Medical Campus, previously known as the Stellenbosch University Flow Cytometry Unit (SUFCU).

The unit has several cytometers available for cell analysis or cell sorting, including two BD FACSCaliburs, BD FACSCanto II, BD Accuri C6 and a BD FACSCount. The FACSCalibur and Accuri have 2 lasers, for the measurement of 4 fluorescent parameters, while the FACSCanto measures of up to 8 fluorescent parameters with its 3 laser system. The FACSCount is a complete system dedicated to absolute CD4-, CD8– and CD3-T-cell counts and CD4 percentages. Also available is the BD FACSJazz flow cytometer, which is equipped to measure 6 fluorescent parameters and has cell sorting capabilities.

The new unit will be under the management of Mrs Andrea Gutschmidt. Mrs Gutschmidt obtained her MSc in Medical Sciences at Stellenbosch University



Mrs Andrea Gutschmidt, analyst at CAF Lite

and has a vast experience in flow cytometry and Immunology. In the Department of Immunology at the Max Planck Institute of Infection Biology in Berlin, Germany, Andrea acquired several techniques such as PCR, proliferation assays, multiparameter flow cytometric analysis of murine and human tissue and cells. As part of the SUN Immunology Research Group, she has been involved in several clinical trials and has presented several lectures on flow cytometry. Please feel free to contact her at 021 938 9400 or andreag@sun.ac.za for

NEW BD FACSJAZZ AT TYGERBERG MEDICAL CAMPUS

The CAF unit has recently acquired a new instrument for cell sorting, the BD FACSJazz™.

The key features of the BD FACSJazz™ include factory-optimized settings, intuitive alignment, real-time video monitoring, and BD FACS™ Accudrop technology. The instrument comes equipped with 2 lasers, measuring up to 6 fluorescent parameters and various cell sorting capabilities.

The BD FACSJazz supports two-way sorting into 5-mL tubes and 15-mL tubes, as well as 96- and 84-well plates, slides, Petri dishes, or other custom collection devices.

The BD FACSJazz™ is housed in the Biosafety Laboratory Level 3 at the Department of Molecular Biology, Tygerberg Campus and will be used primarily for the sorting of infectious cells or particles.

BD FACSJazz™ cell sorter

The instrument will be under the management of Mrs Andrea Gutschmidt. Please feel free to contact our unit for any enquiries about the use of the instrument and the rates.

CELL IMAGING UNIT

NEW STAFF DEVELOPMENTS AT THE CELL IMAGING UNIT

We would like to congratulate Mrs Lize Engelbrecht on the upcoming arrival of her baby. Lize will be on maternity leave as of end April 2014. Arrangements have been made to ensure the smooth running of services, but we would suggest early planning of projects that may require her involvement, to avoid any difficulties.

We have recently appointed a new analyst at the unit. We would like to introduce you to our new microscopy analyst, Ms Dumisile Lumkwana.

Ms Lumkwana has recently completed her MSc in Medical Sciences at the Department of Medical Physiology, Stellenbosch University. The focus of her MSc was to identify appropriate attachment factors in isolated adult rat cardiomyocytes. She employed several techniques, including molecular techniques such as RNA isolation and purification, PCR, as well as histology and fluorescent microscopy.

Ms Dumisile Lumkwanda, our new microscopy analyst

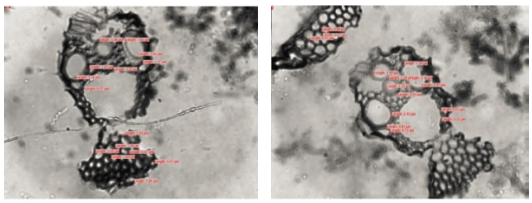
Ms Lumkwana will be primarily responsible for the wide-field microscopy. She will also be responsible to liaise with the Electron beam unit for TEM sample preparation.

RECENT ARTICLES

Exogenous fibrolytic enzymes to unlock nutrients: Histological investigation of its effects on fibre degradation in ruminants

W.F.J. van de Vyver[#]; C.W.C. Cruywagen

Four forages, treated with EFE, were evaluated *in vitro* and histologically to determine the mode-of-action of action and effect of exogenous fibrolytic enzymes (EFE) on tissue degradation. The Olympus IX-81 wide-field microscope was used to view the samples. The study showed that image analysis can be useful to quantify changes in cell walls due to the treatment of forages with EFE.



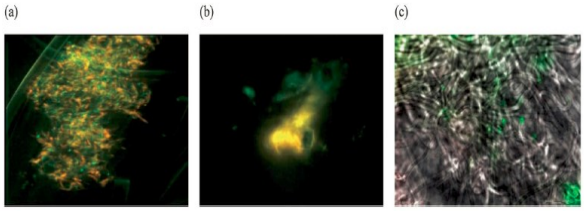
Degradation of kikuyu leaf material treated with dH2O (a) or EFE (a) after 24 h incubation in buffered rumen fluid

A definite, subtle thinning effect of EFE was observed on cell wall thickness of plant material which could be indicative of the mode-of-action of EFE.

pH-dependent adhesion of mycobacteria to surface-modified polymer nanofibers

Lizl Cronje, Robin Warren and Bert Klumperman

This study aimed to determine whether a modified polymer could be developed to capture *Mycobacterium tuberculosis.* under different pH conditions, mimicking different clinical specimens. Affinity studies were performed with *M. bovis* BCG and verified with *M. tuberculosis* . BCG and *M. tuberculosis* were successfully captured under different pH conditions, though the affinity studies revealed that the nanofibrous-capturing polymer should not be too hydrophobic in character, thus preventing close contact with the mycobacteria and a reduction in the capture effectivity of the polymer nanofibers. For the study, fluorescence and light microscopy are regarded as feasible detection methods for *M. tuberculosis* on the modified nanofibers, even at low concentrations.



FMimages of (a) washed nanofibers after incubation with BCG at pH 2, (b) BCG as a positive control and (c) washed nanofibers after incubation in PBS

TRAINING DATES AND SYMPOSIUM

We are planning to have several courses over next few months.

17-18 February 2014 — Flow cytometry

17-18 March 2014 — Basic fluorescent microscopy

7-8 April 2014 — Confocal microscopy

Also, a **CAF student symposium** is planned, which will be held on **27 March 2013**. Abstract submission is already open and all who used CAF facilities are encouraged to submit an abstract. The cost of the symposium is free.

Please visit the website (blogs.sun.ac.za/caf) for more information.

Cell Imaging Unit:

Unit manager: Mrs Lize Engelbrecht

Email: lizeb@sun.a.za

Tel: 021 808 9327

Analyst: Ms Rozanne Adams

Email: rozanne@sun.ac.za

Tygerberg Flow Cytometry:

Mrs Andrea Gutschmidt

Email: andreag@sun.ac.za

Tel: 021 938 9400 (office)

Tel: 021 938 9786 (laboratory)

Please feel free to contact us for any enquiries.