**TOP 5 ARTICLES**

**Director:** Prof Valerie Mizrahi

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**Article:**


DOI: 10.1016/j.coph.2018.05.013

**Impact Factor:** 6.313

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**Summary:**

With an estimated incidence of 490000 cases in 2016, multidrug resistant tuberculosis (TB), against which key first-line anti-tuberculars are less efficacious, presents major challenges for global health. Poor treatment outcomes coupled with a yawning treatment gap between those in need of second-line therapy and those who receive it, underscore the urgent need for new approaches to tackle the scourge of drug-resistant TB. Against this background, significant progress has been made in understanding the complex biology of TB drug resistance and disease pathogenesis, and in establishing a pipeline for delivering new drugs and drug combinations. In this review, we highlight the challenges of drug-resistant TB and the ways in which new advances could be harnessed to improve treatment outcomes.
Summary:

Background: Evidence for the importance of accumulating sufficient physical activity in the early years is mounting. This study aimed to determine the relationship between maternal and infant objectively measured physical activity, and to examine the diurnal interactions between these behaviours while accounting for potential covariates.

Methods: Mothers and infants (n = 152 pairs; infants aged 3-24 months) were recruited from Soweto, South Africa, and physical activity was measured using a wrist worn accelerometer (Axivity AX3, Axivity Ltd., Newcastle-upon-Tyne, UK) for 3-7 days. Mothers completed sleep diaries recording night time-in-bed (used as a proxy for nocturnal sleep status) for themselves and their infant; and reported times during which their infant was in their personal care (caregiver status) for each day during the measurement period. Significant correlates of infant physical activity, as well as the interactions between mother's physical activity, day of the week, sleep status, and caregiver status, were included in panel regression analyses with infant physical activity as the outcome.

Results: There was an equal distribution of boys and girls, and their age ranged from 2.6 to 24.5 months. The majority of mothers (73%) did not spend any time apart from their infant. During weekdays, the combined effect of mother's physical activity (β=0.11), the interactions between mother's physical activity and caregiver status (β=0.17), and sleep status (β= - 0.04) on infant physical activity was β=0.24; while during weekend days this association was β=0.21; and was largely moderated by the interaction between the mother being with the infant and her activity levels (β=0.23), but partly attenuated by mother's physical activity independent of other variables (β= - 0.04). For each hour of the day, for both mother and infant, peaks of physical activity were higher when the mother was not the primary caregiver.

Conclusions: Infant physical activity levels were strongly associated with their mother's activity levels particularly during the week; this relationship was stronger when mothers were more active while looking after their infant. Mothers should be encouraged to be active when looking after their children, particularly during the week, and to provide infants with as much opportunity to be active as possible.
Article:
DOI: 10.1093/infdis/jiy388
Impact Factor: 5.186

Summary:
Background: Women enrolled in HIV prevention efficacy trials, are counselled at every visit on prevention of HIV, STIs and pregnancy. Incident pregnancy impacts on efficacy outcomes. Incidence rates of pregnancy and HIV/STIs among women who became pregnant and associated risk factors were assessed.

Methods: Data from 9165 women participating in HIV prevention trials in KwaZulu-Natal, South Africa, from 2002-2012 were combined. Demographic and behavioural predictors of incidence pregnancy and incidence HIV and STIs were determined using Cox regression models.

Results: Overall pregnancy incidence was 9.6 per 100-person year (py) (95%CI: 9.1, 10.3). HIV incidence among pregnant women was 5.93 per 100-py (95%CI: 4.73, 7.44). Incidence of STIs among pregnant women for Chlamydia trachomatis, Trichomonas vaginalis, Neisseria gonorrhoeae, and Treponema pallidum (syphilis) were 10.87, 7.42, 3.92 and 1.43 per 100-py, respectively. In the adjusted analyses, we observed overlapping risk factors for HIV acquisition during pregnancy i.e. young age, not married/not cohabitating and low parity. Young women (<20 years of age) were over 3 times at higher risk of pregnancy and HIV acquisition.

Discussion: We identified overlapping risk factors for pregnancy and HIV incidence, suggesting an urgent need for appropriate, targeted, individual-centred counselling for women participating in HIV prevention trials.
Article:

DOI: 10.1016/j.msec.2018.06.016
Impact Factor: 5.080

Summary

Core-sheath structured fibres were developed for application as part of an alternative malaria vector control intervention aimed at reducing outdoor malaria transmission. The fibres were prepared by melt spinning of high density polyethylene (HDPE) as sheath and with a concentrate containing volatile N,N-Diethyl-m-toluamide (DEET) in poly(ethylene-co-vinyl acetate) (EVA) as core. The concentrate was prepared by a simple absorption processes to a content up to 40 wt% DEET. Scanning electron microscope imaging confirmed the formation of a bicomponent core-sheath fibre structure. Confocal Raman spectroscopy revealed the development of a concentration gradient of DEET in the sheath layer, suggesting a diffusion controlled release process. Excellent processability was demonstrated on an extrusion system melt spinning with take up speeds reaching 3000 m min−1. Sample textiles knitted from such filaments showed high residual repellence activity even after 20 cold washes or after eight months ageing under laboratory conditions. These findings indicate that this technology offers an alternative way to prevent outdoor mosquito bites in an effective and affordable manner.
Summary
Anti-tuberculosis (TB) drugs possess diverse abilities to penetrate the different host tissues and cell types in which infecting Mycobacterium tuberculosis bacilli are located during active disease. This is important since there is increasing evidence that the respective "lesion-penetrating" properties of the front-line TB drugs appear to correlate well with their specific activity in standard combination therapy. In turn, these observations suggest that rational efforts to discover novel treatment-shortening drugs and drug combinations should incorporate knowledge about the comparative abilities of both existing and experimental anti-TB agents to access bacilli in defined physiological states at different sites of infection, as well as avoid elimination by efflux or inactivation by host or bacterial metabolism. However, while there is a fundamental requirement to understand the mode of action and pharmacological properties of any current or experimental anti-TB agent within the context of the obligate human host, this is complex and, until recently, has been severely limited by the available methodologies and models. Here, we discuss advances in analytical models and technologies which have enabled investigations of drug metabolism and pharmacokinetics (DMPK) for new TB drug development. In particular, we consider the potential to shift the focus of traditional pharmacokinetic-pharmacodynamic analyses away from plasma to a more specific "site of action" drug exposure as an essential criterion for drug development and the design of dosing strategies. Moreover, in summarising approaches to determine DMPK data for the "unit of infection" comprising host macrophage and intracellular bacillus, we evaluate the potential benefits of including these analyses at an early stage in the preclinical drug development algorithm.
1. **INTRAMURAL RESEARCH UNITS**

**Alcohol, Tobacco and Other Drug**

   DOI: 10.1111/dar.12820
   **Impact Factor: 2.855**

   DOI: 10.1186/s12962-018-0109-8
   **Impact Factor: 1.788**

   DOI: 10.4102/sajpsychiatry.v24i0.1162
   **Impact Factor: 0.356**

   DOI: 10.1186/s12916-018-1080-0
   **Impact Factor: 9.088**

**Biomedical Research and Innovation Platform**

   **Impact Factor: 1.623**

   DOI: 10.1002/gch2.201800014
   **Impact Factor: None**

**Biostatistics**

   DOI: 10.1097/qad.0000000000001812
   **Impact Factor: 4.914**

   DOI: 10.1213/ane.0000000000003554
   **Impact Factor: 3.463**
Impact Factor: 2.224

Burden of Disease
Impact Factor: 2.617

Centre for Tuberculosis
Impact Factor: 15.239

DOI: 10.1371/journal.pone.0197913
Impact Factor: 2.766

Gender and Health
DOI: 10.1371/journal.pone.0198926
Impact Factor: 2.766

HIV Prevention
DOI: 10.1089/aid.2018.0031
Impact Factor: 1.935

DOI: 10.1016/S2352-3018(18)30071-7
Impact Factor: 11.355
   DOI: 10.1093/infdis/jiy388
   Impact Factor: 5.186

**Non-Communicable Disease**

   DOI: 10.1186/s12879-018-3162-1
   Impact Factor: 2.620

   DOI: 10.1016/j.ijcard.2018.05.010
   Impact Factor: 4.034

   DOI: 10.1093/ajcn/nqy105
   Impact Factor: 6.549

   DOI: 10.1017/s0007114518001071
   Impact Factor: 3.657

   DOI: 10.1007/s00240-018-1071-9
   Impact Factor: 2.038

   DOI: 10.7196/SAMJ. 2018.v108i7.12978
   Impact Factor: 2.163

**Office of AIDS Research**

   DOI: 10.4102/phcfm.v10i1.1711
   Impact Factor: None
Impact Factor: 3.017

South African Cochrane Centre
Impact Factor: None

Impact Factor: 2.229

Impact Factor: 2.229
2. EXTRAMURAL RESEARCH UNITS

Bioinformatics Capacity Development
   Impact Factor: 1.913

Child and Adolescent Lung Health
   DOI: 10.1186/s41479-018-0050-9
   Impact Factor: None

   DOI: 10.3389/fendo.2018.00294
   Impact Factor: 3.519

   DOI: 10.1136/bmjpo-2018-000282
   Impact Factor: None

Common Epithelial Cancer
   DOI: 10.1002/jgh3.12061
   Impact Factor: None

Developmental Pathways for Health
   DOI: 10.3390/nu10060736
   Impact Factor: 4.196

   DOI: 10.1186/s12966-018-0692-2
   Impact Factor: 5.548

Gynaecological Cancer
   DOI: 10.1128/genomeA.00584-18
   Impact Factor: None

**Impact Factor:** None

**HIV/TB Pathogenesis and Treatment**

**Impact Factor:** 11.355

**Hypertension and Cardiovascular Disease**

**Impact Factor:** 2.548


**Impact Factor:** 2.369

**Immunology of Infectious Disease**

**Impact Factor:** 4.122

**Microbial Water Quality Monitoring**

**Impact Factor:** 2.345


**Impact Factor:** 2.145


**Impact Factor:** 2.145
**Molecular Mycobacteriology**

   DOI: 10.1016/j.coph.2018.05.013  
   **Impact Factor:** 6.313

   DOI: 10.1002/iub.1866  
   **Impact Factor:** 3.236

   DOI: 10.1128/aem.00687-18  
   **Impact Factor:** 3.633

**Respiratory and Meningeal Pathogens**

   DOI: 10.1093/jpids/piy055  
   **Impact Factor:** 2.456

   DOI: 10.1128/jcm.00228-18  
   **Impact Factor:** 4.054

   DOI: 10.1016/s1473-3099(18)30292-5  
   **Impact Factor:** 2.514

**Risk and Resilience in Mental Disorders**

   DOI: 10.1186/s12888-018-1772-1  
   **Impact Factor:** 2.419
Impact Factor: 41.058

**Rural Public Health and Health Transition**

Impact Factor: 4.902

3. **GRANT FUNDED RESEARCH**

Impact Factor: 3.022

Impact Factor: None

Impact Factor: 4.277

Impact Factor: 3.508

Impact Factor: None

Impact Factor: 6.944

Impact Factor: 3.017
4. RESEARCH CENTRES

Advancing Care and Treatment (ACT) For TB/HIV

   DOI: 10.5588/ijtld.17.0485
   Impact Factor: 2.392

Centre for Sustainable Malaria Control

   DOI: 10.1016/j.msec.2018.06.016
   Impact Factor: 5.080

   DOI: 10.1186/s13071-018-2824-6
   Impact Factor: 3.163

   DOI: 10.1128/aac.02214-17
   Impact Factor: 4.255

5. CLOSED RESEARCH UNITS

Diarrhoeal Pathogens

   DOI: 10.1016/j.vaccine.2018.03.035
   Impact Factor: 3.285
6. RESEARCH UNITS WITH NO QUALIFYING PUBLICATIONS

Intramural

- Environment and Health
- Health Systems
- Office of Cancer
- Office of Malaria
- Office of Tuberculosis
- Primate
- Violence, Injury and Peace

Extramural

- Antiviral Gene Therapy
- Centre for Antimicrobial Resistance
- Drug Discovery and Development
- Health Services to Systems
- Herbal Drugs
- Maternal and Infant Health Care Strategies
- Prospective Gastrointestinal Cancer
- Stem Cell Research and Therapy

Research Centres

- Centre for Basic and Translational Human TB Research
- Centre for Multi-disciplinary Research on Malaria
- Centre for Optimising Antimalarial Therapy in South Africa
- Centre for Tuberculosis Biomarker-Targeted Intervention
- Clinical and Community HIV-Tuberculosis Research Collaborating Centre
- Soweto Matlosana SAMRC Collaborating Centre for HIV/AIDS and TB
- TB Free through Research and Innovation
- Tuberculosis Collaborating Centre for Child Health (TB-CHILD)
- Tygerberg SAMRC Collaborating centre for HIV Laboratory Research
- Wits Clinical HIV/TB Research Unit, WITS Health Consortium
- Wits RHI Collaborating Centre for HIV/AIDS
7. **GRANTS AWARDED**

### SAMRC LIST OF NEW CONTRACTS FOR JUNE 2018

<table>
<thead>
<tr>
<th>SAMRC Unit</th>
<th>Funder</th>
<th>Main Funder</th>
<th>Project Title/Description</th>
<th>Contract Value</th>
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<td>National Research Foundation</td>
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<td>NIH</td>
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<td>HSRU</td>
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<td>NIH</td>
<td>Our Family: A Resilience – oriented family intervention to prevent adolescent HIV/STI Infection and depression in South Africa</td>
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<td>University of Cape Town</td>
<td>NIH</td>
<td>Using information to align services and link and retain men in HIV Cascade</td>
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<td>NCDRU</td>
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<td>National Research Foundation</td>
<td>NRF grant 2018: Thuthuka Funding Instrument (Post-PhD Track) Dr Cindy George</td>
<td>34,783</td>
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**Total:** 31,803,421 $2,270,271