



# MTN SCHOLARS PROGRAM

## **ASSESSING CIRCULATING HIV DRUG RESISTANCE PROFILES & CO-RECEPTOR USAGE IN HILLBROW, JOHANNESBURG**

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**WITS REPRODUCTIVE HEALTH & HIV INSTITUTE**

# BACKGROUND



**PrEP – promising strategy**  
**Truvada, Tenofovir, Dapivirine , Maraviroc**

**Effectiveness of such PrEP - impacted by HIV dynamics**

**Drug resistance in HIV +ve partners**

**Influence efficacy of NRTI & NNRTI based topical & oral PrEP**

**Proportion of HIV +ve partner with CXCR4 virus**

**Influence potential efficacy of Maraviroc**

**VITAL TO DETERMINE THESE FACTORS PRIOR TO INTRODUCTION OF THESE CANDIDATES**

# BACKGROUND

## □ Prevalence of HIV resistance mutations (Gauteng)

2004 - 2010	2012
Regimen 1a & 1b	Regimen 1
D4T + 3TC + EFV/NVP	TDF + 3TC/FTC + EFV/NVP
<5%	7.5% (Wallis et al., 2012)

## □ The mutations of greatest interest are K103N, K65R and M184V

## □ Limited data on prevalence of CXCR4 using virus (South Africa)

- Prevalence rates of  $\pm 30\%$

Connell *et al.*, AIDS 2008; Ataher *et al.* J Int AIDS Soc, 2012 )

## □ Why evaluate drug resistance & co-receptor usage ?

- In the context of ART scale-up in South Africa, ARV resistance  $\uparrow$  as more patients fail HAART due to adherence & other factors

# STUDY QUESTIONS

- What is the frequency of drug resistance & predominant co-receptor usage among ART exposed HIV +ve men in the Hillbrow population?
- What is the prevalence of specific key mutations and CXCR4 using viruses in this population?
- What proportion of this population has both drug resistance and CXCR4 usage vs. either resistance or CXCR4 usage?
- Are those individuals with drug resistance more likely to have CXCR4 using viruses?

# STUDY POPULATION

- ±300 ART exposed HIV +ve men with HIV –ve female partners pre-screened for inclusion into studies conducted at WRHI CRSs



- **Inclusion criteria**
  - HIV +ve with HIV-ve partner
  - ART Exposed
  - Aged 18-45 years
  - Willing to consent to study procedures
  - Willing to provide adequate locator information

# STUDY ANALYSIS

- ❑ To assess the prevalence of K103N, K65R and M184V drug mutations and correlates of drug resistance
- ❑ To determine the frequency of CXCR4 using virus and correlates of CXCR4 using virus

Using specific assays to be determined in consultation with MTN Virology lab (Drs. Parikh and Mellors)

This study would be a new study & will not be using existing data. Its initiation will be contingent on obtaining funding for lab testing

# ACKNOWLEDGMENT

- ❑ MTN Scholars Program
- ❑ WRHI

Thank you

# RATIONALE

- Hillbrow – High migrant population
- The most common drugs in first line regimens: 3TC, D4T , AZT, NVP & EFV (TDF & FTC in SA)

ARVs		Related Mutations	PrEP potentially affected
NRTI	3TC	M184V, K65R	Tenofovir, Truvada
	D4T	K65R, M41L, K70R, L210W,T215Y/F, T69, Q151M	
	AZT	M41L, K70R, L210W,T215Y/F, T69, Q151M	
	TDF	K65R, M41L, K70R, L210W,T215Y/F, T69, Q151M	
	FTC	M184V, K65R	
NNRTI	NVP, EFV	Y181C, K103N	Dapivirine