P4-S1.09 DEVELOPMENT OF A MICROWAVE: ACCELERATED METAL-ENHANCED FLUORESCENCE 40 S, <100 CFU/ML POINT OF CARE ASSAY FOR THE DETECTION OF *CHLAMYDIA TRACHOMATIS* AND *NEISSERIA GONORRHOEA*

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Chlamydia trachomatis (CT) is the most prevalent bacterial sexually transmitted infection (STIs) reported to the Centers for Disease Control and Prevention (CDC). There were 1.2 million cases of chlamydia reported to the CDC in 2008. *Neisseria gonorrhoeae* (GC) is also one of the most prevalent sexually transmitted infections in men and women. In 2009, there were 301 174, cases reported to the CDC, a rate of 99.1 per 100 000 populations. The CDC estimates that STIs cost the healthcare system $1.5 billion annually. Subsequently, there is an urgent need to develop a low cost sensitive and specific rapid diagnostic test to detect bacterial sexually transmitted infections. To this end, an exciting, novel and rapid technology, which integrates power lysis" and MAMEF (Microwave-Accelerated Metal-Enhanced Fluorescence), to both lyse CT and GC and detect the DNA released from CT and GC and combined CT and GC samples, within 40 s, is demonstrated. In a microwave cavity, 2.45 GHz microwave energy is highly focused into a lysing chamber, using 100 nm thick gold films with "bow-tie" structures, to lyse the bacteria within 10 s. The ultrafast detection of the released DNA from <100 cfu/ml bacteria is accomplished in an additional 30 s by employing the microwave-accelerated metal-enhanced fluorescence (MAMEF) technique. This new "release and detect" platform technology is a highly attractive alternative method for the lysing of bacteria, DNA extraction and the fast quantification of bacteria and potentially many other pathogenic species and cells as well. Our approach is a significant step forward for the development of a point of care test for bacteria.

P4-S1.10 LONGITUDINAL CHANGES IN CERVICOVAGINAL CYTOKINE LEVELS UPON INCIDENT *CHLAMYDIA TRACHOMATIS* INFECTION AMONG YOUNG WOMEN

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Background Highest rates of genital *Chlamydia trachomatis* (CT) infection are found in 15–24-year-old women. Animal, in vitro, and ex vivo studies have identified several inflammatory and regulatory cytokines that impact infection clearance, recurrence, and immunopathology. However, the in vivo natural history of the cytokine response is not well-described. Our study aim was to characterise the cytokine levels in the cervicovaginal secretions of young women with incident CT.

Methods Women were eligible to enrol (as part of a prospective HPV Natural History Study) who were 13–21 years old, sexually active (5 years maximum), and had no history of cervical neoplasia or procedures, or immunosuppression. Women were seen every 4 months for interviews, infection tests, and cervicovaginal lavage samples for cytokine measurement by Luminex® multiplex assay. CT was detected by nucleic-acid amplification. This prospective study selected women (N=64) who had incident CT infection, defined as a negative CT result followed by a positive CT result at a later visit. Cytokine levels were tested at each woman's pair of negative and positive visits. Each sample was run in duplicate wells. To address assay variation among our samples, per cent-differences between duplicate wells were calculated. A woman's cytokine response was defined as positive" if the per cent-increase from her negative visit to her positive visit exceeded the [mean+2 SD] of the inter-well per cent-difference for that cytokine. Similarly, "negative" was defined as an inter-visit per cent-decrease that exceeded the [mean+2 SD] of the inter-well per cent-difference. The remaining women were defined as having "no response".

Results The mean age at incident infection was 19 years. Infections concurrent to the positive CT were detected for HPV in 24 (38%) women; yeast in 10 (16%); bacterial vaginosis in 5 (8%); *Neisseria gonorrhoeae* in 3 (5%); and *Trichomonas vaginalis* in 1 (2%). Abstract P4-S1.10 table 1 shows the distribution of cytokine responses. Response status was not significantly associated with age or other genital infections (HPV, yeast, bacterial vaginosis, *N gonorrhoeae*, *T vaginalis*) detected at either the negative CT or positive CT visits.

Conclusions In young women with incident CT, the in vivo cytokine responses measured in the cervicovaginal fluid compartment are heterogeneous. Differences in the cytokine milieu between individuals may have implications for immune defense and immunopathology.

Basic sciences poster session 2: HIV and Hepatitis

P4-S2.01 A CROSS-SECTIONAL SURVEY OF HEPATITIS B VIRUS INFECTIONS AND NATURAL IMMUNITY AGAINST HEPATITIS B VIRUS INFECTIONS AMONG HIV DISCORDANT HETEROSEXUAL COUPLES IN KISUMU, KENYA

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Background HIV and hepatitis B virus (HBV) share transmission modes. HIV infected people are thought to be at increased risk of

Abstract P4-S1.10 Table 1 Longitudinal changes in cervicovaginal cytokine levels upon incident *Chlamydia trachomatis* infection among young women (N=64 women)

Cytokine	Median cytokine level at negative CT visit (pg/ml)	Median cytokine level at subsequent positive CT visit (pg/ml)	Women with positive response, n (%)	Women with no response, n (%)	Women with negative response, n (%)
IL-6	30.3	30.3	23 (36)	19 (30)	22 (34)
IL-8	1855.5	1832.6	8 (16)	30 (60)	12 (24)
IL-1α	345.3	316.1	23 (36)	14 (22)	27 (42)
IL-1β	29.0	43.3	31 (48)	14 (22)	19 (30)
MIP-1α	14.1	19.6	28 (44)	16 (25)	20 (31)
RANTES	3.2	5.1	30 (47)	22 (34)	12 (19)
IFNγ	3.2	3.2	16 (25)	43 (67)	5 (8)

CT, *Chlamydia trachomatis*.