The Potential of Oxytocin in Modulating Female Genital Tract Epithelium to Prevent HIV Transmission

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CAHR 2022

Virtual Symposium

Apr. 27-29, 2022

HIV and Oxytocin (OXT)

- 1.7 million new HIV infections in 2019, with 730 000 in East and Southern Africa primarily by vaginal sex.
- Group of commercial sex workers from Kenya displayed epidemiologically-defined resistance to HIV infection.[2] Primarily characterized by lower resting levels of pro-inflammatory cytokines and reduced immune activation in the blood and at the female genital tract (FGT).
- Disruption of the FGT barrier has been associated with states of increased HIV susceptibility (e.g. luteal menstrual phase).
- Previous literature has shown a role for the 'love hormone' oxytocin in reducing inflammation in gut and skin epithelium, as well as in improving wound healing in a mouse model.

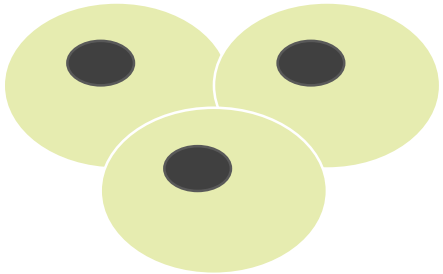
Hypothesis

- Oxytocin reduces inflammation and improves wound healing ability in female genital tract epithelium, and reduces susceptibility of $CD4^+$ T cells to HIV infection *in vivo*.

Methods

Cell Line	Vk2	Ect1	End1
Origin	Vaginal	Ectocervical	Endocervical

Inflammation



+ Media → Unstimulated → (-) Control; (+) Treated

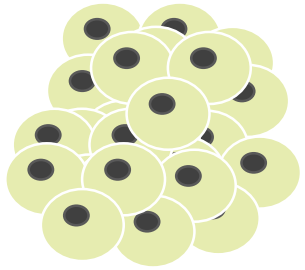
+ 1 µg/mL PIC/LyoVec → Stimulated → (-) Control; (+) Treated

Treatment:
OXT 10 – 10 000 pg/mL

Time point:
3 hr – RNA
qPCR analysis

Wound Healing

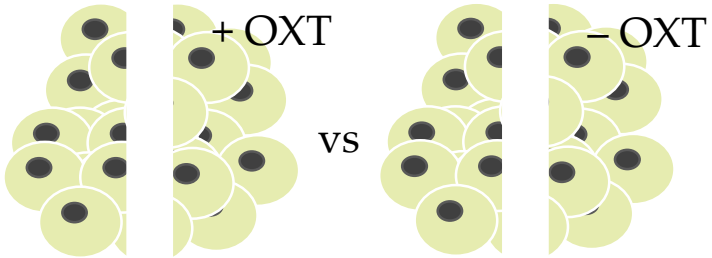
Grew Cells to Confluency in 6-Well Plates



Scratch w/ p200 Pipette Tip

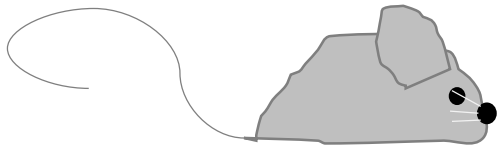
+ or – 10 000 pg/mL OXT

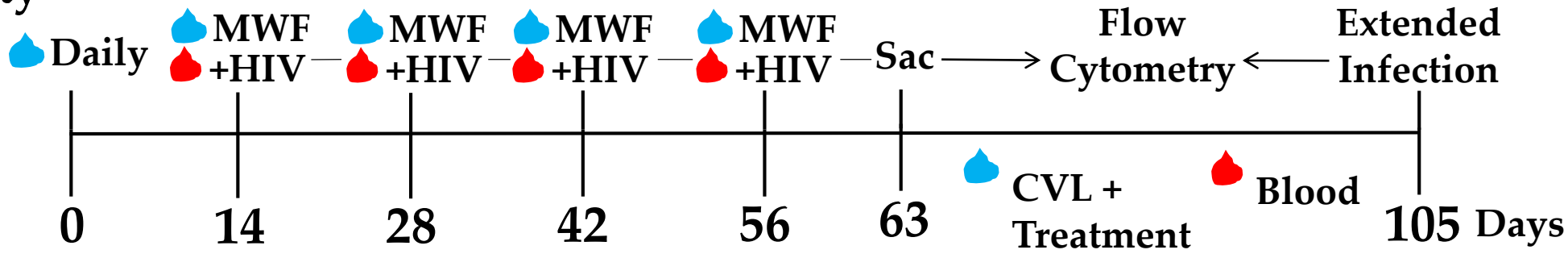
Comparisons are Made Between OXT Treated and Untreated



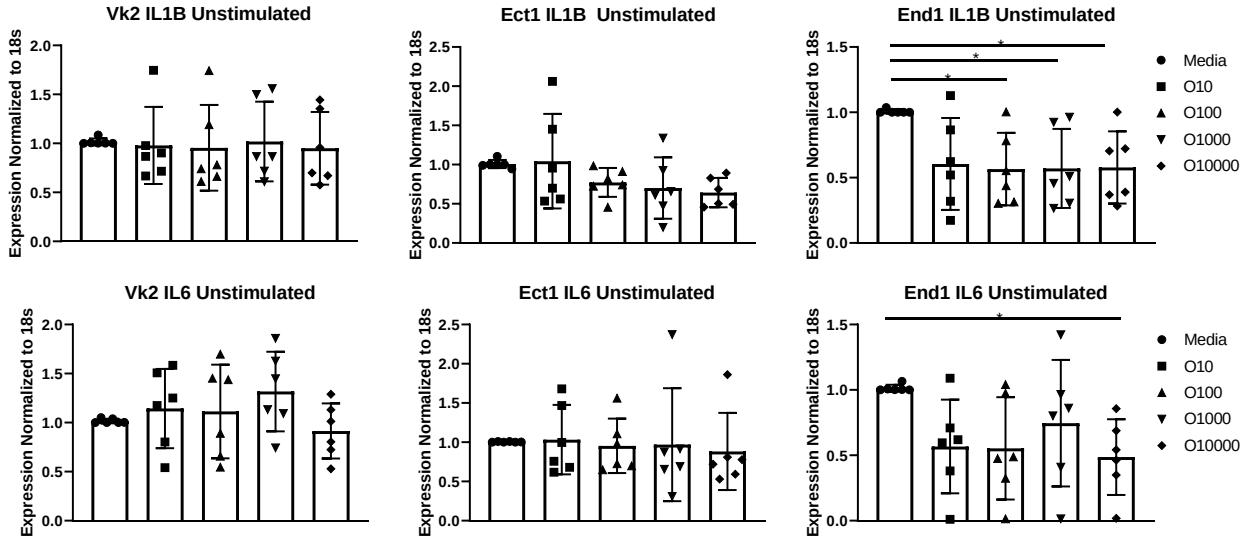
HIV Susceptibility

♀ TKO(Rag2$^{-/-}$IL2γc$^{-/-}$ CD47$^{-/-}$)-hBLT Mice

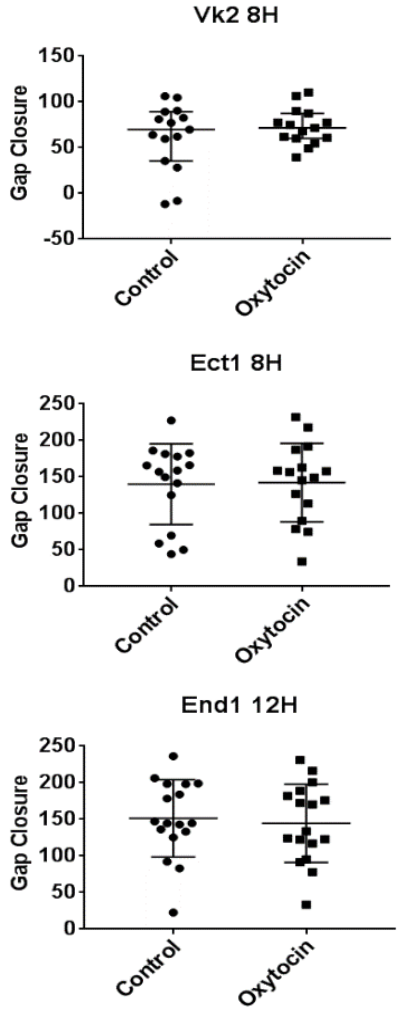




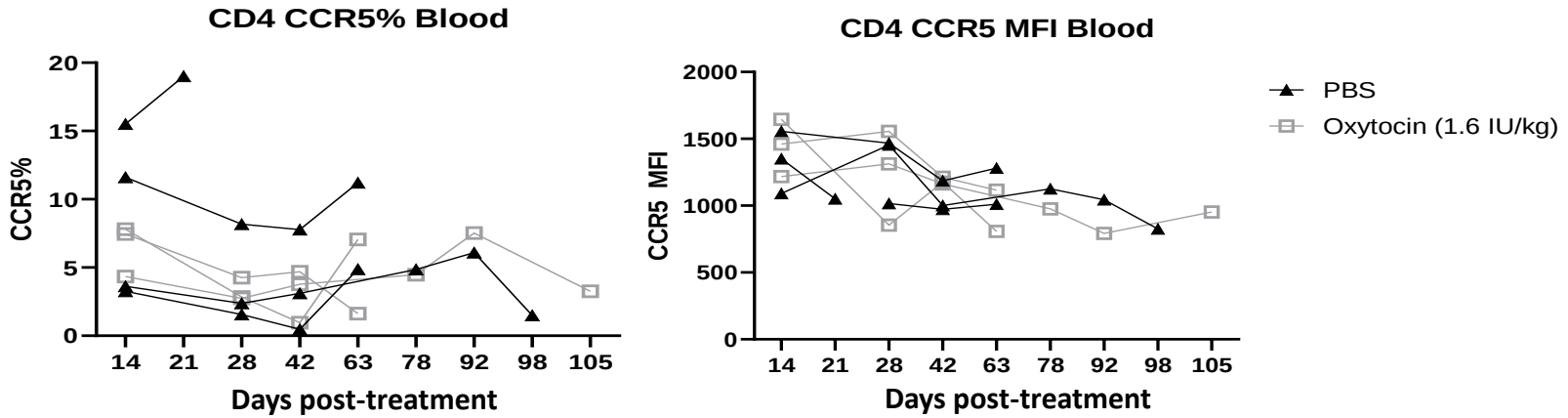
Oxytocin Reduces End1 Basal Inflammation



Oxytocin Does Not Improve Gap Closure



Oxytocin Does Not Effect CD4+ T Cell CCR5 Expression



Conclusions

- Oxytocin treatment reduces IL-1β and IL-6 gene expression in End1 cells, but this effect is reversed upon stimulation with Poly(I:C)/LyoVec.
- Oxytocin does not show an effect on FGT epithelium wound healing in scratch assays.
- Oxytocin does not show an effect on the expression of activation markers in $CD4^+$ T cells in TKO-hBLT when given as an intravaginal gel.

Acknowledgements

Public Health Agency of Canada
Agence de la santé publique du Canada
CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada
University of Manitoba