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Session: Let's talk about HIV Cure

HIV Cure in the News: The South African child







Conflict of interest disclosure



I have no relevant financial relationships with ineligible companies to disclose



Affiliated Independent Event







Children with HIV Early Antiretroviral Therapy (CHER) Trial: 2005-2011





≤ 12 weeks of age with CD4% ≥ 25%

Deferred Therapy

initiated when met WHO immunologic or clinical criteria
N=125

Early Therapy: 40 weeks

initiated immediately, continued to 1 year of age

N=143: 122 stopped ART

Early Therapy: 96 weeks

initiated immediately, continued to 2 years of age

N=143: 105 stopped ART

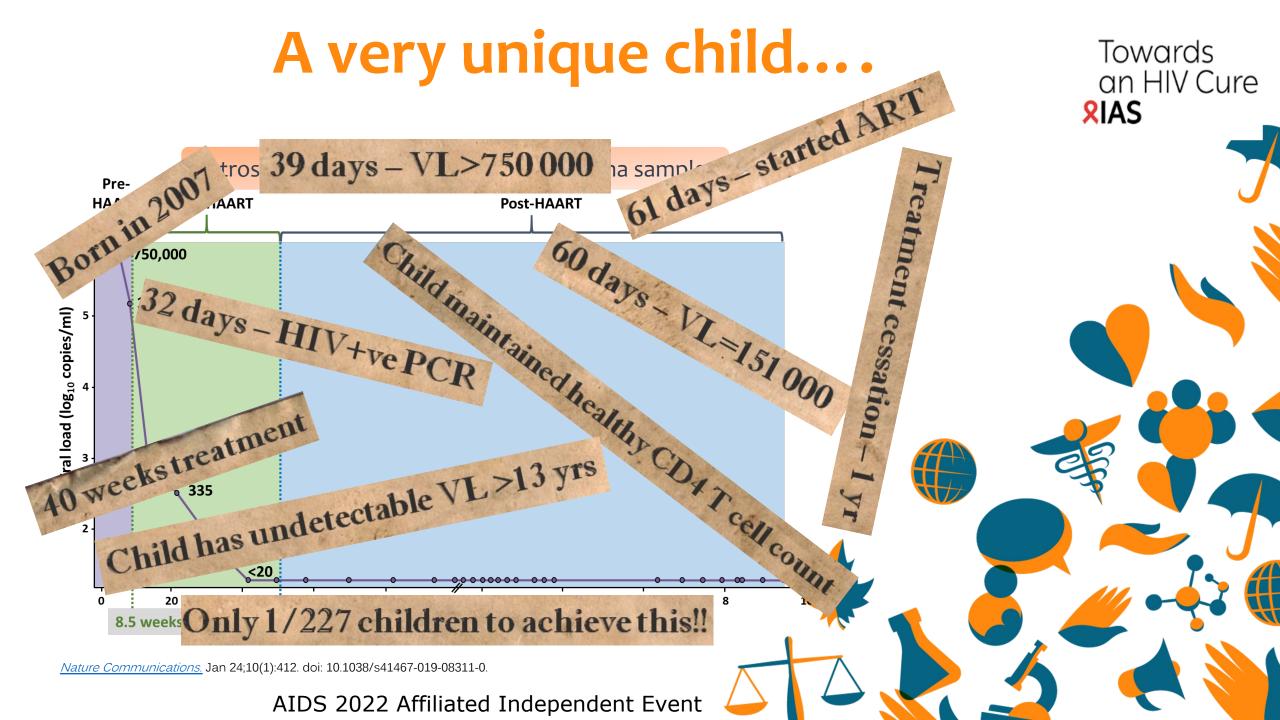
Drug Regimen

zidovudine + lamivudine + lopinavir/ritonavir

ART was re-initiated:

CD4% <20% and clinical criteria were met





At 9.5 years of age....

HIV Qualitative PCR Negative

Standard Diagnostic tests

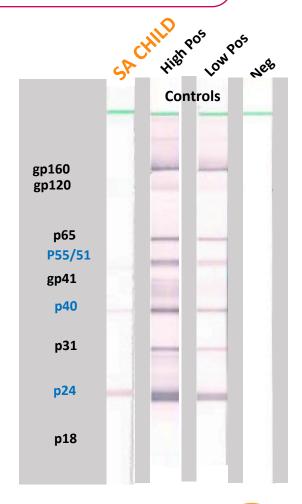
ELISA: HIV-specific antibodies

Negative

Viral Load Target not detected

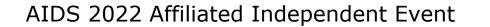
Western Blot: HIV-specific antibodies

Indeterminate











Can we detect any sign of HIV infection?

proviral reservoir and detectable viral load (10ml plasma)

Can we detect a HIV-specific immune response?

weak CD4+ T cell GAG response and HIV-Abs using luminex

Does the child have any features that may explain control?

low CCR5 and high PD-1

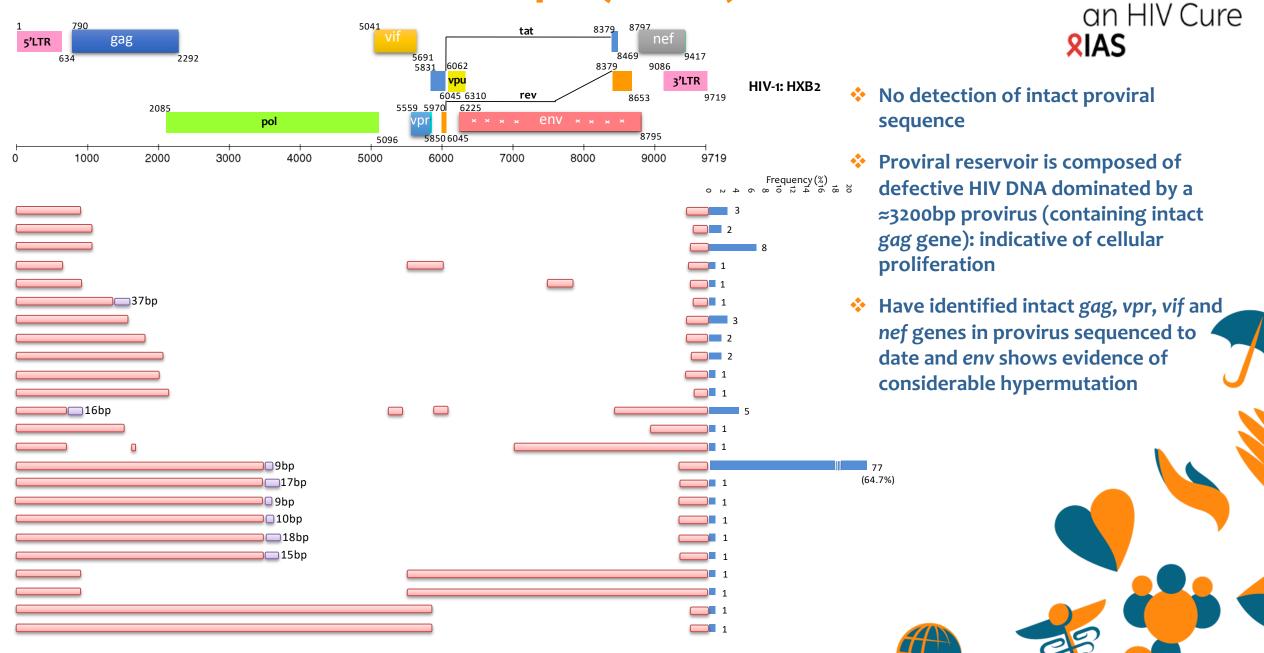
Are there any signs of replication-competent HIV?

?....ongoing work





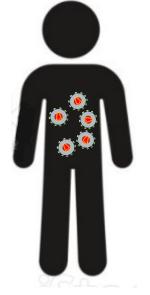
Proviral Landscape (FLIPS)



Towards

Further searches for replication competent virus

Towards an HIV Cure



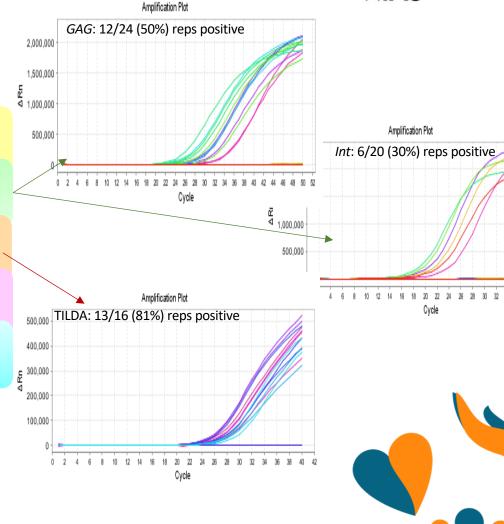
VIRAL OUTGROWTH ASSAY

UNSPLICED HIV RNA

MULTIPLY-SPLICED HIV RNA

EPISOMAL DNA (2-LTR)

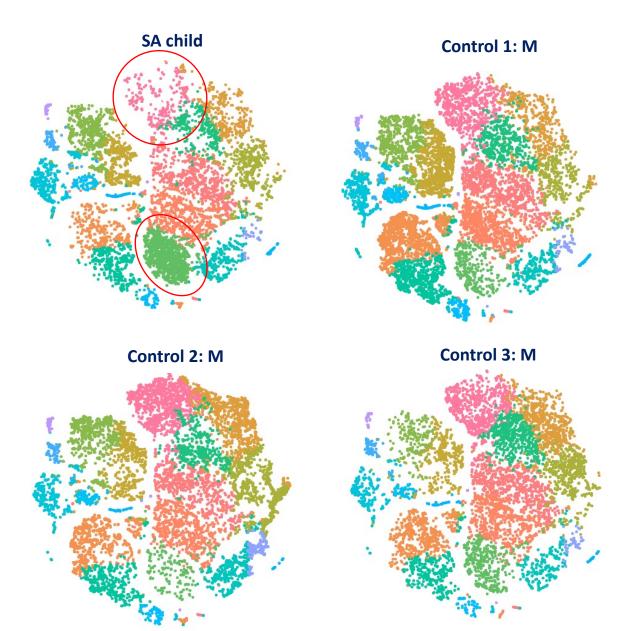
RNA-FLOW FISH ASSAY





Hot off the press....





10x Single cell RNA
sequencing PBMCs from
the SA child and three
control (HIV-negative)
male children



Closing



Affiliated Independent Event

- In summary, this unique child maintains a heathy CD4:CD8 ratio and undetectable viral load by standard assays 14 years post treatment cessation
- Although we can detect signals of transcriptionally active HIV we have no evidence to support replication competent HIV thus far
- The child has some interesting features, including high PD-1 expression despite low immune activation, that warrant further investigation
- Continued intense studies using a platform of new technologies will be conducted to try and understand how this child has managed to achieve what appears to be a 'cure' – may offer insights into cure strategies



Acknowledgements

Towards an HIV Cure **SIAS**

Research

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