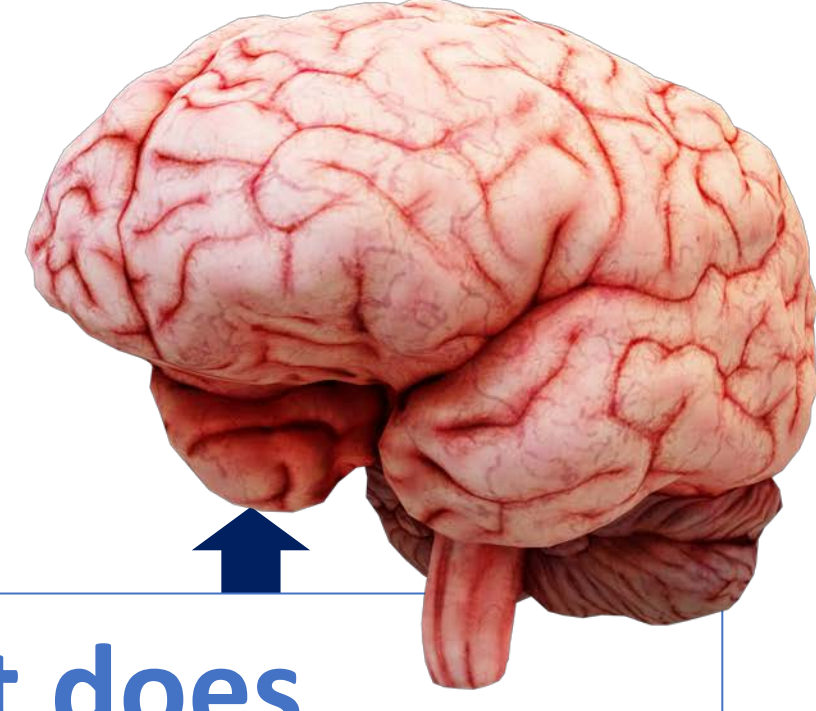


WHAT EFFECT DOES HIV HAVE ON THE BRAIN?

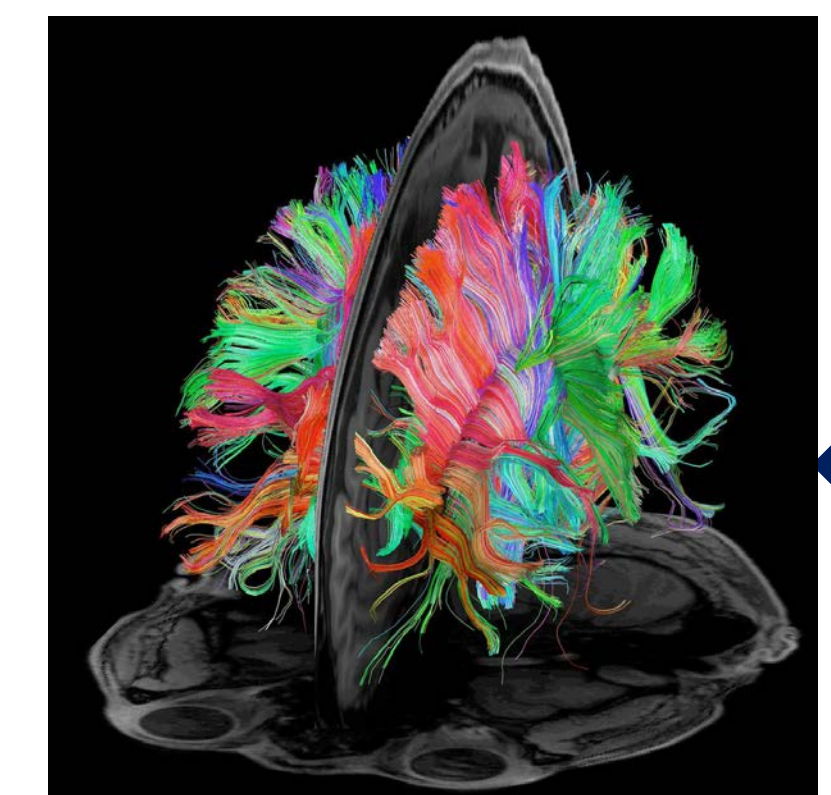
Introduction

- MRI is non-invasive, allowing scientists to investigate activity and development without causing harm.
- There are many different MRI modalities, each allowing something different to be studied.

Structure: Shape and size (thickness, volume)



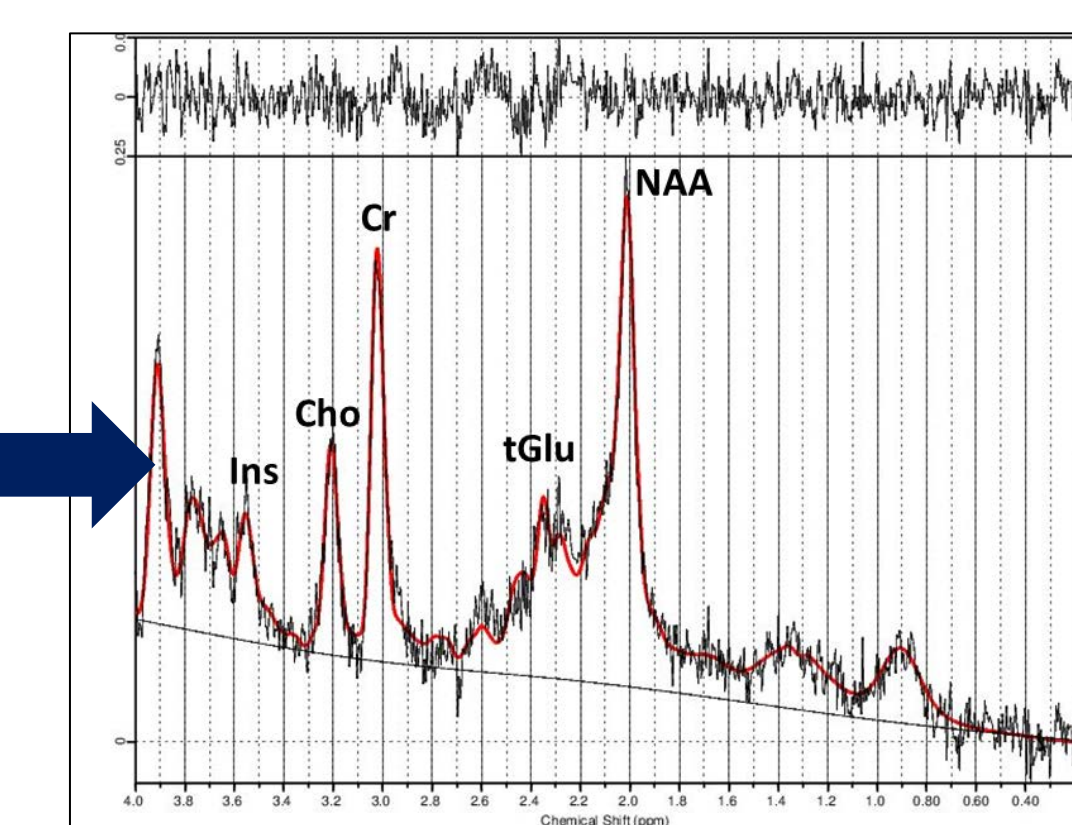
Diffusion: Water molecules (DTI)



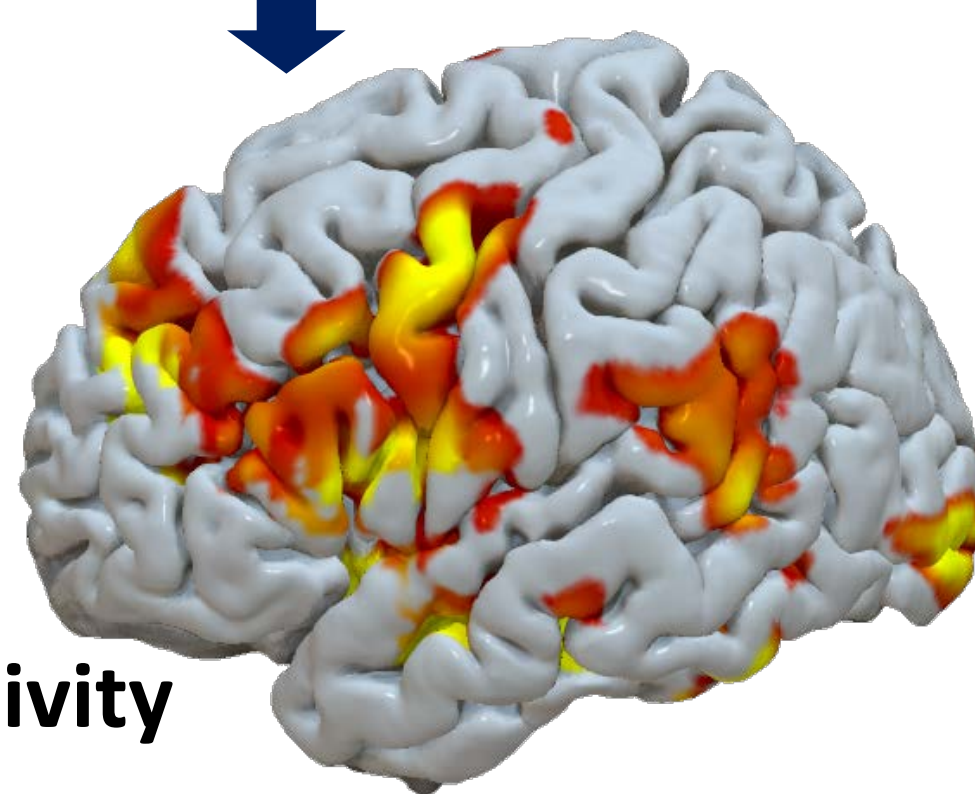
What does MR Imaging Measure?



Biochemicals: Creatine, Cho



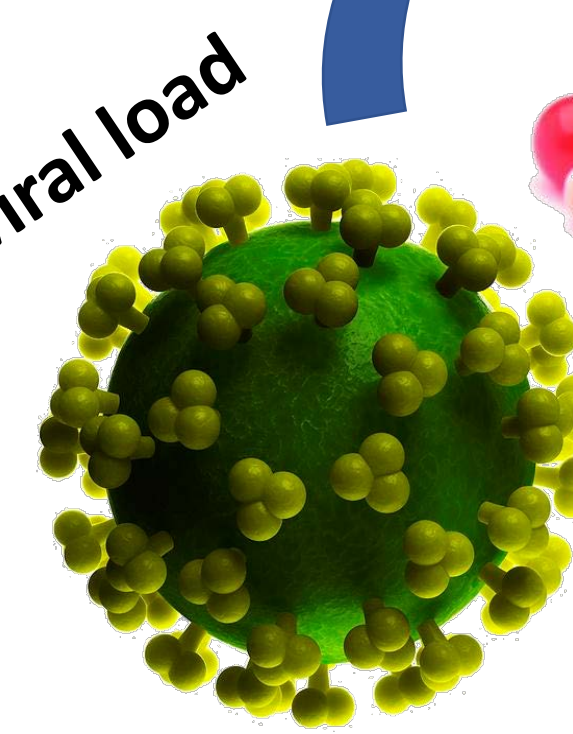
Brain activity



HIV & Treatment

Viral load suppression using ART & PMTCT

HIV viral load



Results

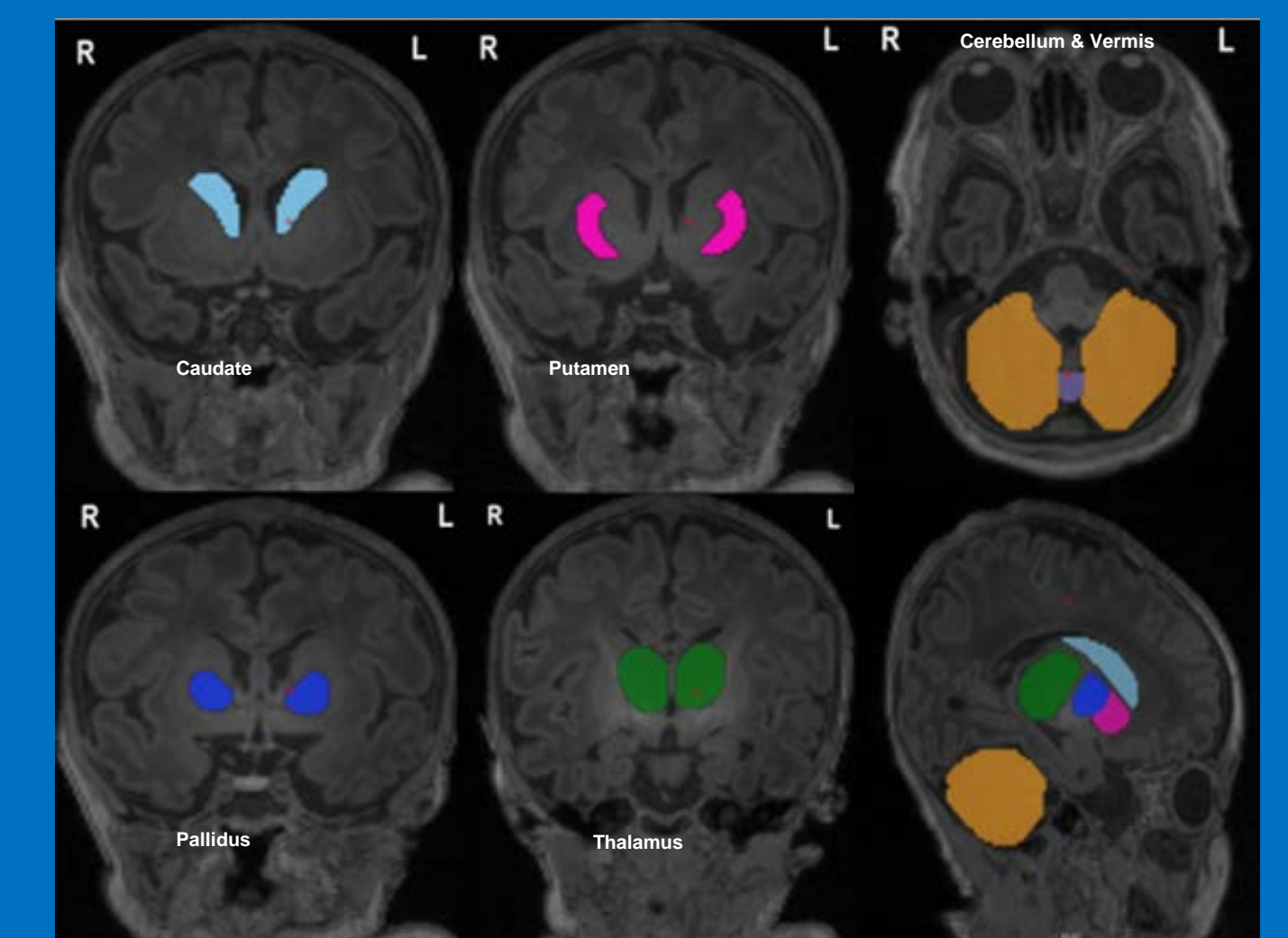
- Reduced Mortality
- Better clinical outcomes
- Better neuropsychological test outcomes at 18 months

Unknowns
Prevailing effects of HIV in brain reservoirs

HIV+ children received ART and their viral loads were suppressed from a young age (between 6 and 76 weeks)

NEUROIMAGING FINDINGS

- Smaller volumes in these regions may be related to shorter in utero exposure to ART for shorter periods, indicating that ART exposure in utero may be neuroprotective



Structural results

- Tracts with HIV/ART exposure related alterations recover at 9 years.
- Early established alterations persist in HIV infection while new white matter damage resolves.
- Subtle differences in white matter connections in the somatosensory, salience and default mode networks of HIV+ children while HEU children show alterations in tracts in the visual and motor networks.

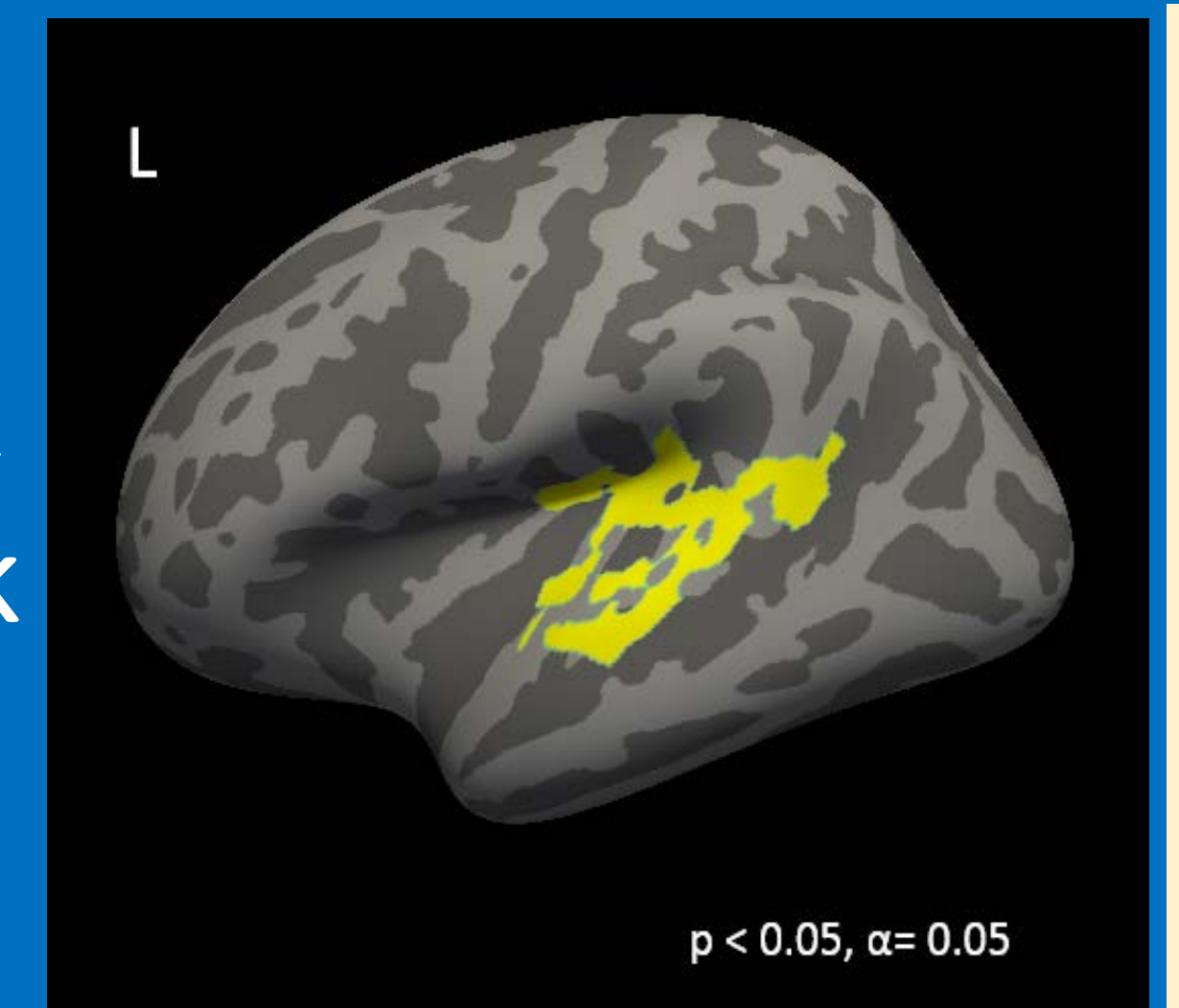
Diffusion results



- Choline, indicating inflammation, is consistently higher in gray matter in children with HIV over the ages of 5—11 years
- Age-related changes in NAA, a marker of the health of neurons, differ between children with and without HIV in white matter.

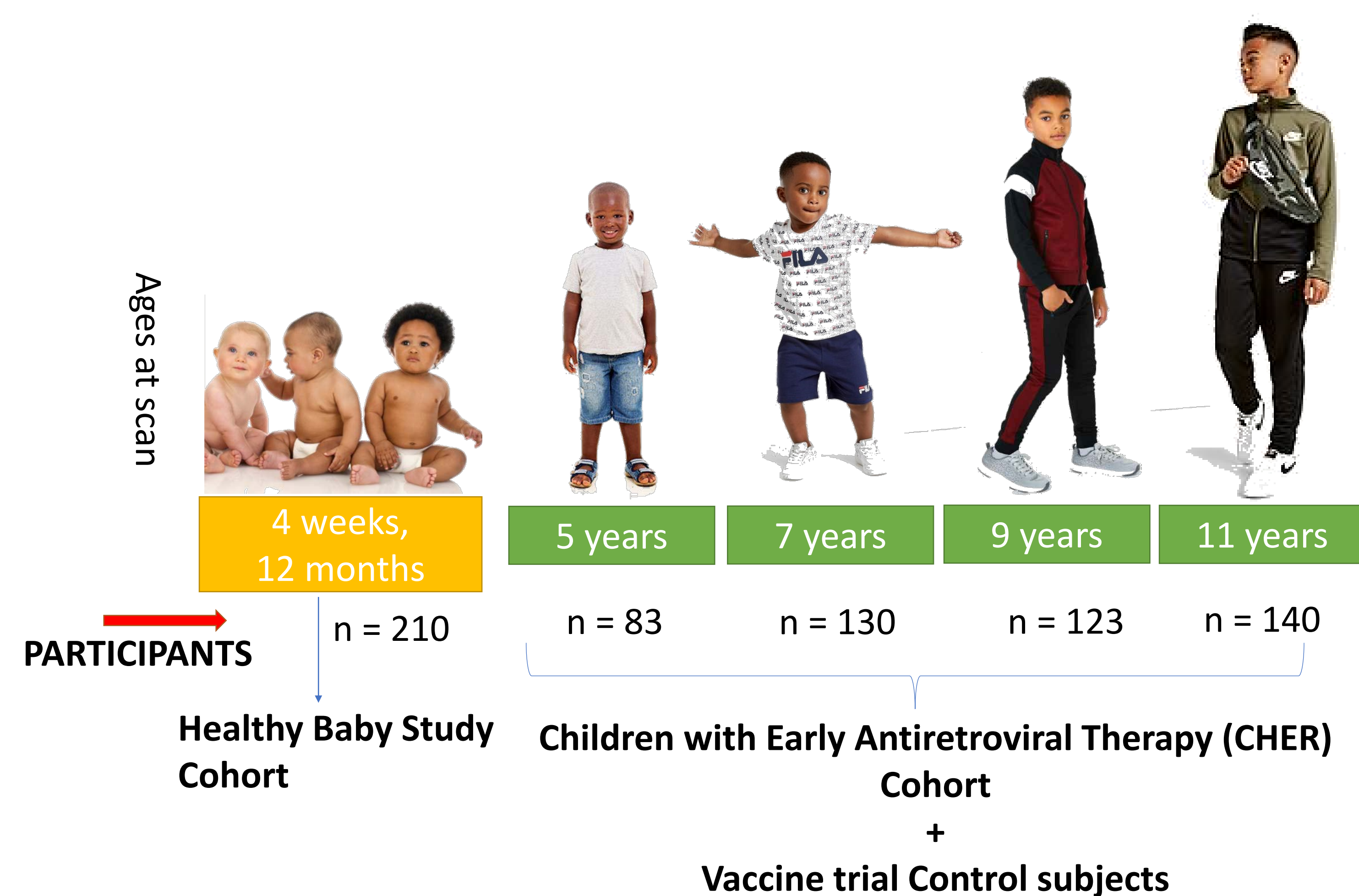
Spectroscopy results

- 11 year old children from the CHER trial
- Children with HIV used the left auditory cortex less than control children during a hearing task



Functional results

Participants



- Healthy Baby Study examines the developing brains of this cohort in comparison with matched unexposed (HUU) control infants.
- CHER trial was conducted to determine when to start treatment for perinatally acquired HIV.

Benefits of participating in HIV research

- Finding the best treatment for HIV
- Increasing awareness for HIV
- Knowledge is power

CONCLUSION

- The effects of perinatal HIV infection and exposure continue to be seen in the brain despite early treatment.
- HIV+ individuals, particularly pregnant women, should adhere to their treatment as there are numerous benefits associated.

- The information gained from these studies may contribute to the greater body of knowledge regarding HIV impacts and may help improve treatment in future.
- These results can be linked to the findings of cognitive studies in the future.