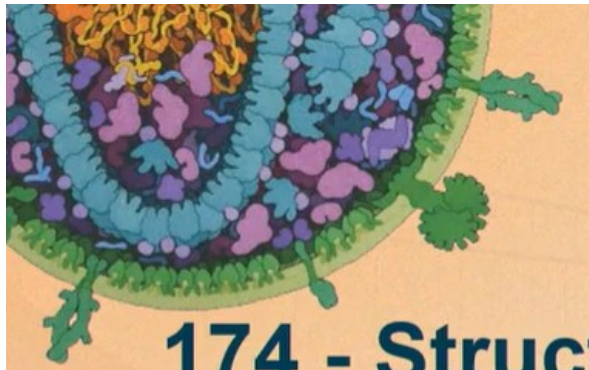

Oral Abstract Session-09

Wednesday, March 12, 2025

174 - Structural Brain Volumes Decrease After SARS-CoV-2 Infection Among People With HIV

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Disclosure: Dr Bolzenius has no financial relationships with ineligible companies to disclose.

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Background

- HIV is associated with structural brain abnormalities
- SARS-CoV-2 is associated with changes in brain structure particularly among inferior frontal and/or orbitofrontal brain regions

SARS-CoV-2 is associated with changes in brain structure in UK Biobank

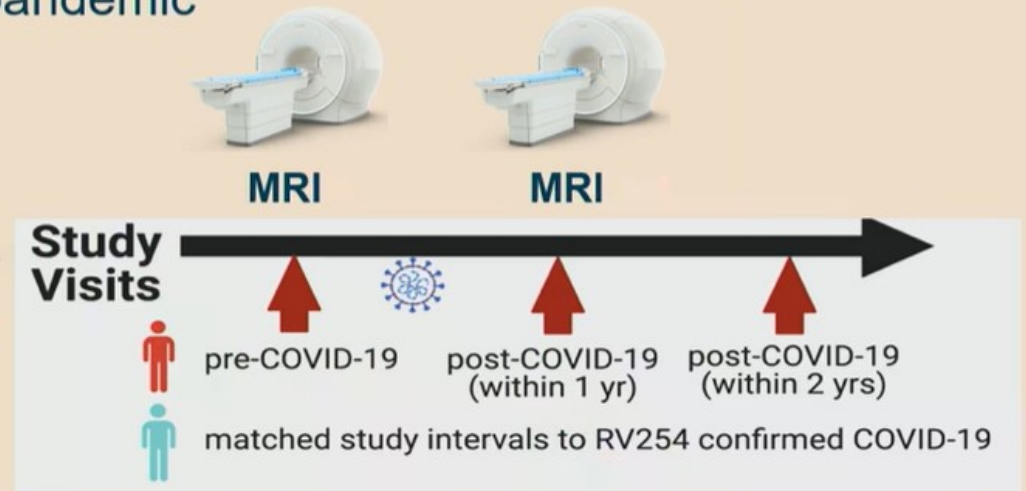
Gwenaëlle Douaud ✉, Soojin Lee, Fidel Alfaro-Almagro, Christoph Arthofer, Chaoyue Wang, Paul McCarthy, Frederik Lange, Jesper L. R. Andersson, Ludovica Griffanti, Eugene Duff, Saad Jbabdi, Bernd Taschler, Peter Keating, Anderson M. Winkler, Rory Collins, Paul M. Matthews, Naomi Allen, Karla L. Miller, Thomas E. Nichols & Stephen M. Smith

Nature **604**, 697–707 (2022) | Cite this article

- "Second hit" from SARS-CoV-2 may exacerbate existing HIV-related inflammation
- **Study Goal**: examine structural brain changes following infection with SARS-CoV-2 among people with HIV (PWH)

Methods

- Participants selected from RV254, a longitudinal study of people enrolled and treated in acute HIV infection
- **COVID+ PWH**: 54 PWH who acquired SARS-CoV-2 between MRI scans
- **COVID- PWH**: 38 PWH with MRI scans before start of COVID pandemic



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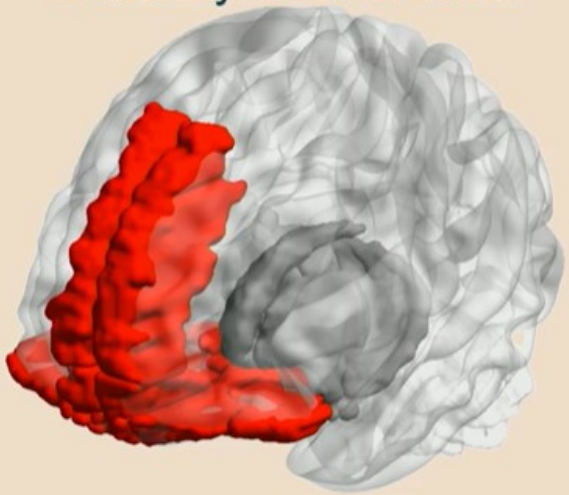
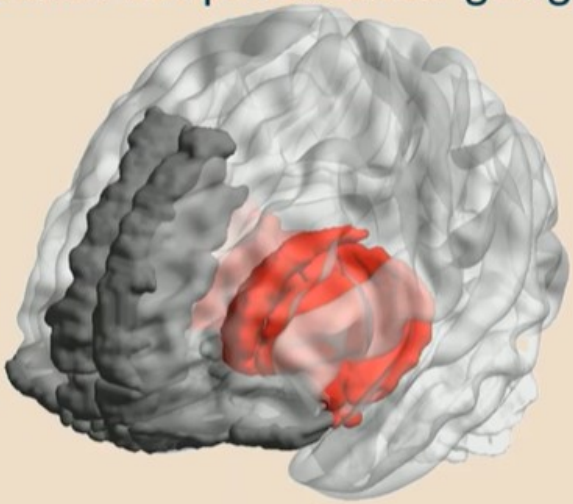
Methods

Selected 15 regions of interest

Olfactory/Orbitofrontal



Medial temporal/Basal ganglia



- All individuals were registered to a common template using FSL VBM, then segmented into gray matter regions of interest
- Repeated-measures MANCOVA used to assess volumetric changes over time between groups, using time between MRIs as a covariate

Results

	COVID+ PWH (n=54)	COVID- PWH (n=38)	p-value
Age, M (SD)	32.09 (9.43)	29.37 (7.22)	.156
Male Sex, n (%)	54 (100%)	36 (100%)	-
Education, n (%)			.207
Primary-High School	16 (30.8%)	16 (42.1%)	
Bachelor Degree or Higher	36 (69.2%)	22 (57.9%)	
CD4+ T-cell count, cells/mm^3, median [IQR]	608 [445-812]	659 [543-866]	.136
CD8+ T-cell count, cells/mm^3, median [IQR]	715 [489-912]	600 [518-824]	.552
Plasma HIV RNA >20 copies/mL, n (%)*	1 (1.9%)	3 (7.9%)	.162
Long COVID at 2nd MRI, n (%)	7 (13.0%)	-	-
Years between MRI scans, M (SD)	3.96 (1.91)	1.20 (0.67)	**<.001**

Data captured at first MRI visit.
*Note: Values of detectable viral loads ranged between 23-81 copies/mL

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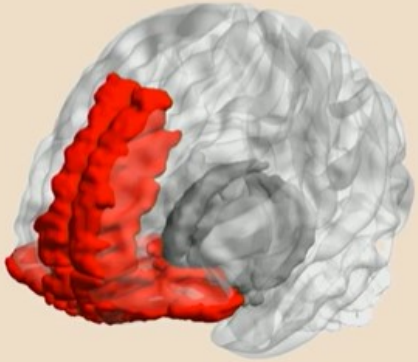
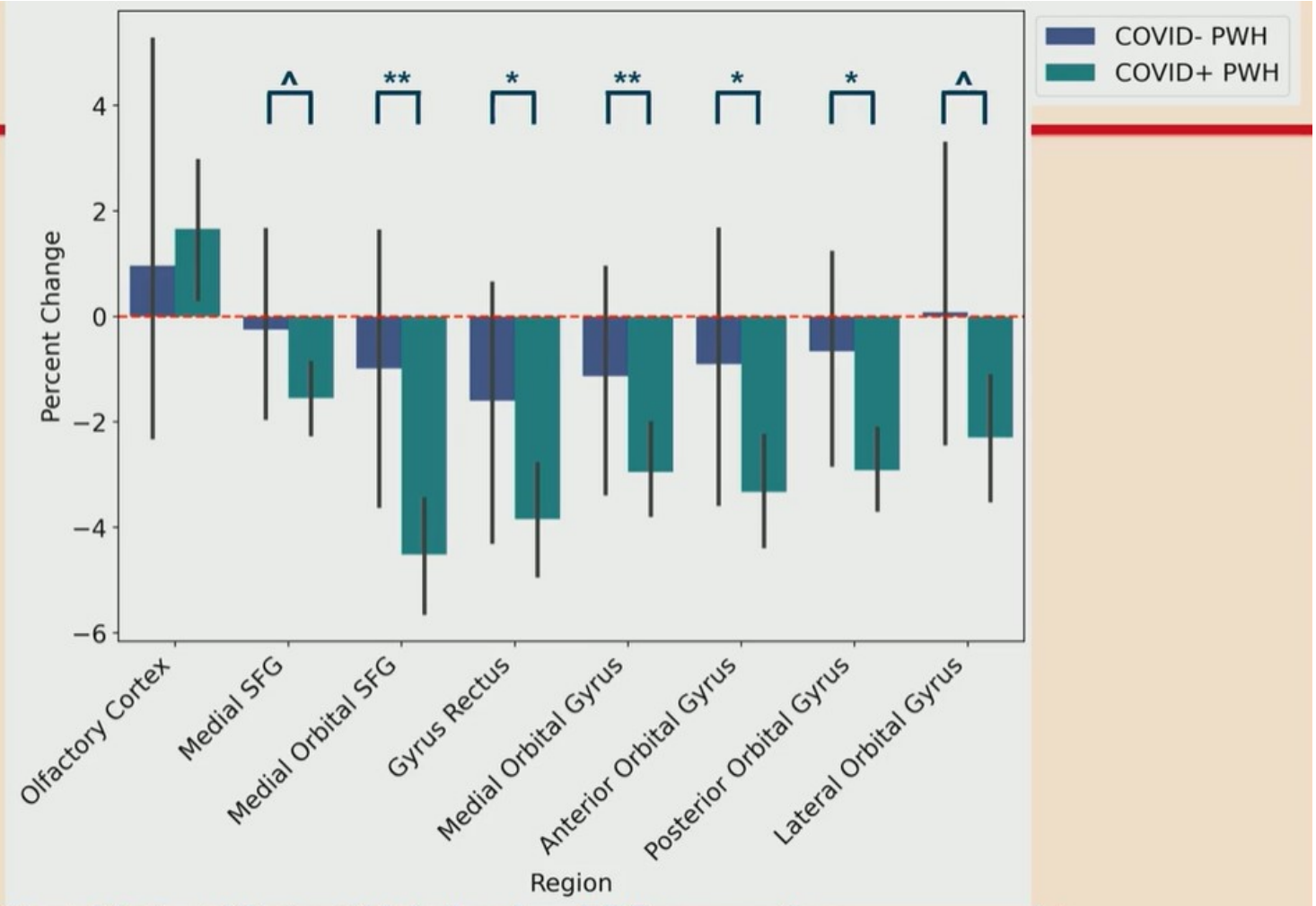
Frontal Volumes Decrease over Time among COVID+ PWH





**p<.01; *p<.05; ^p<.10 following FDR correction

Bars represent 95% confidence intervals

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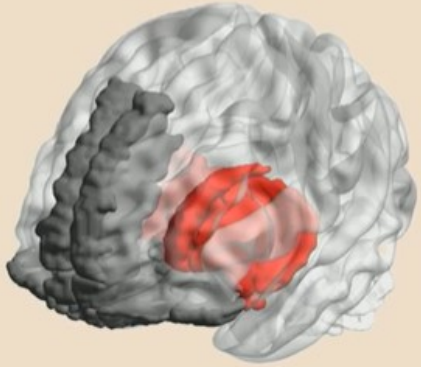
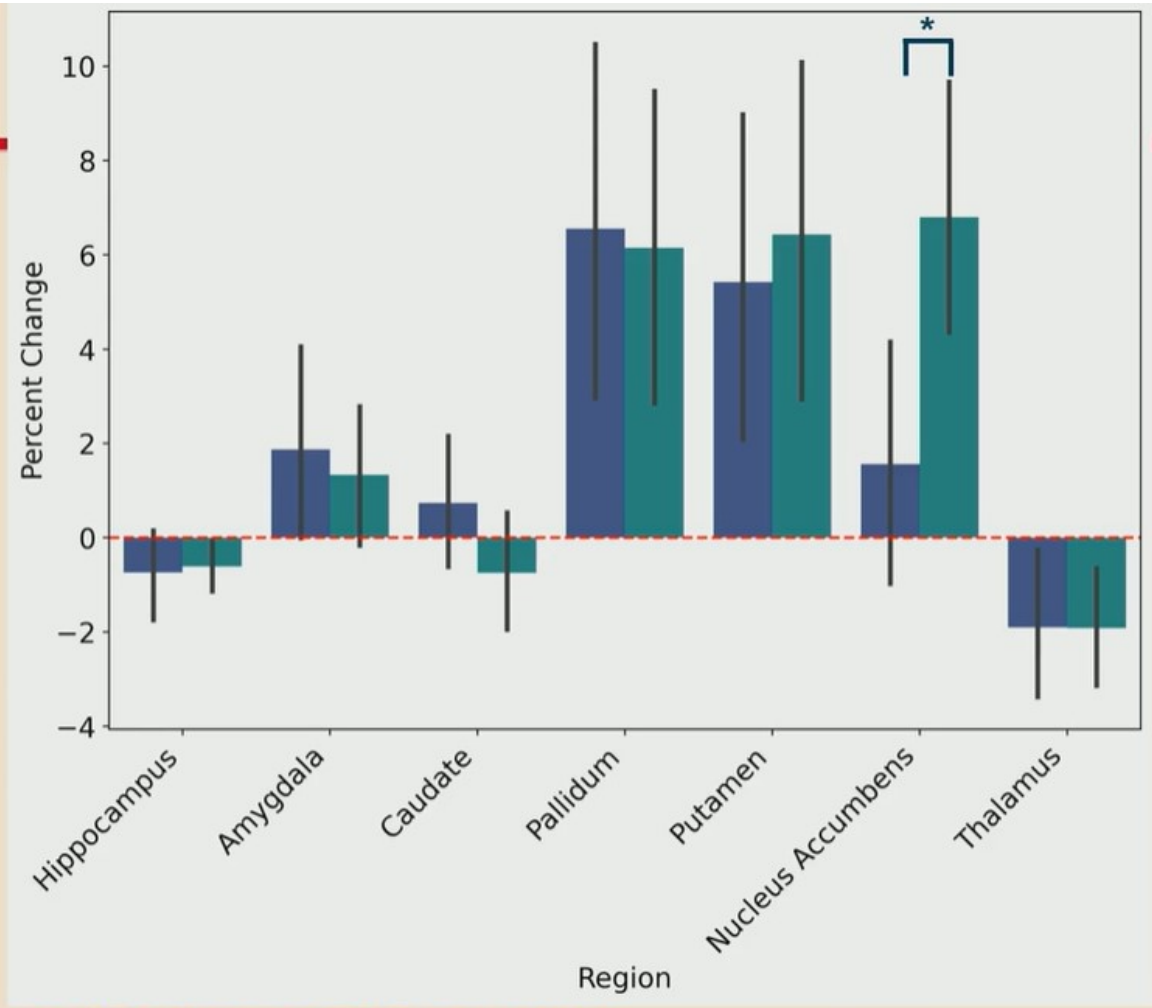
Basal Ganglia Volumes Vary between Subgroups





***p<.05 following FDR correction**

Bars represent 95% confidence intervals

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Conclusions

- Structural brain changes vary regionally among COVID+ PWH
- More consistent volumetric decreases in frontal regions among COVID+ PWH
  - Frontal lobe susceptibility to COVID among PWH
  - Variable group trajectories noted in basal ganglia
- Continuing to examine potential predictors of longitudinal volumetric change, including HIV disease characteristics, cognitive status, and mental health indices

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Material has been reviewed by the Walter Reed Army Institute of Research. There is no objection to its presentation and/or publication. The opinions or assertions contained herein are the private views of the author, and are not to be construed as official, or as reflecting true views of the Department of the Army, the Department of Defense, or HJF. The investigators have adhered to the policies for protection of human participants as prescribed in AR 70–25

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