Australian National University

Hormone replacement therapy, insulin, and hippocampal volumes in postmenopausal women: a longitudinal study

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- The hippocampus is a structure within the brain that is vital for memory and spatial cognition.
- Pathological hippocampal atrophy in ageing can result in memory, goal setting, and mood regulation dysfunction[1].

- Impaired insulin metabolism is a risk factor for hippocampal atrophy[2].
- Hormone replacement therapy in postmenopausal women can be protective against hippocampal atrophy[3].
- Hormone replacement therapy can be beneficial for insulin function (though not all studies find this)[4,5].

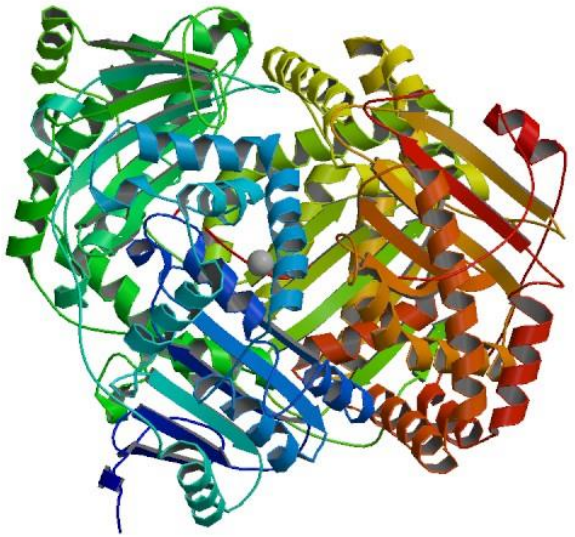

Image source: http://www.rcsb.org/pdb/explore.do?structureId=2wk3

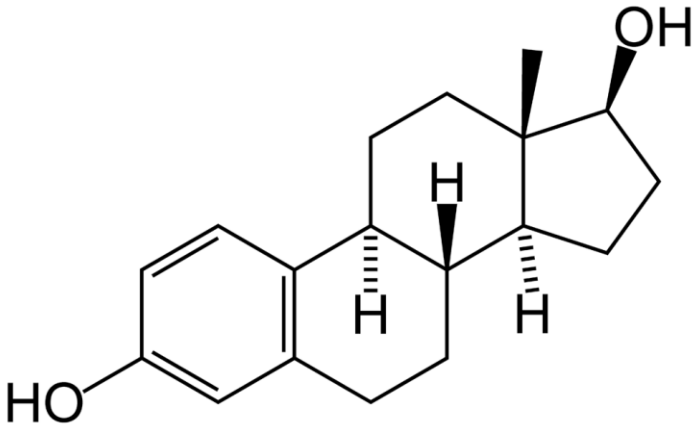

Image source: http://menopausehealthmatters.com/wp-content/uploads/2015/08/estrogen-molecule.png

It remains unclear whether insulin function is a mediator of the longitudinal association between hormone replacement therapy and age-associated hippocampal atrophy.

- Participants were drawn from the Personality and Total Health (PATH) study
  - 327 post-menopausal community-living women
  - aged 40-65 (M=45) at baseline
  - followed over 12 years.

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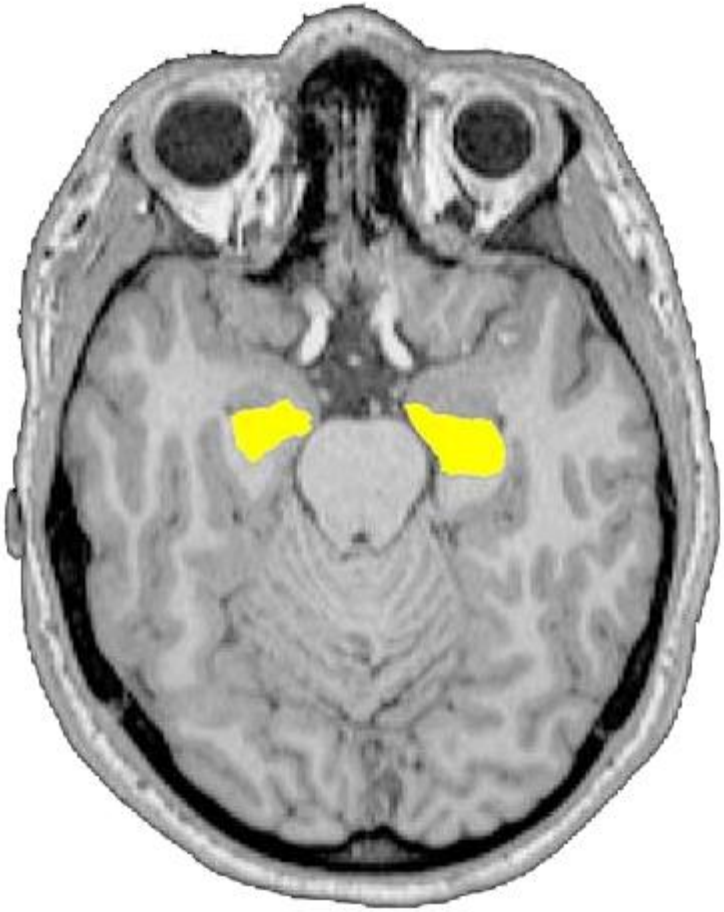
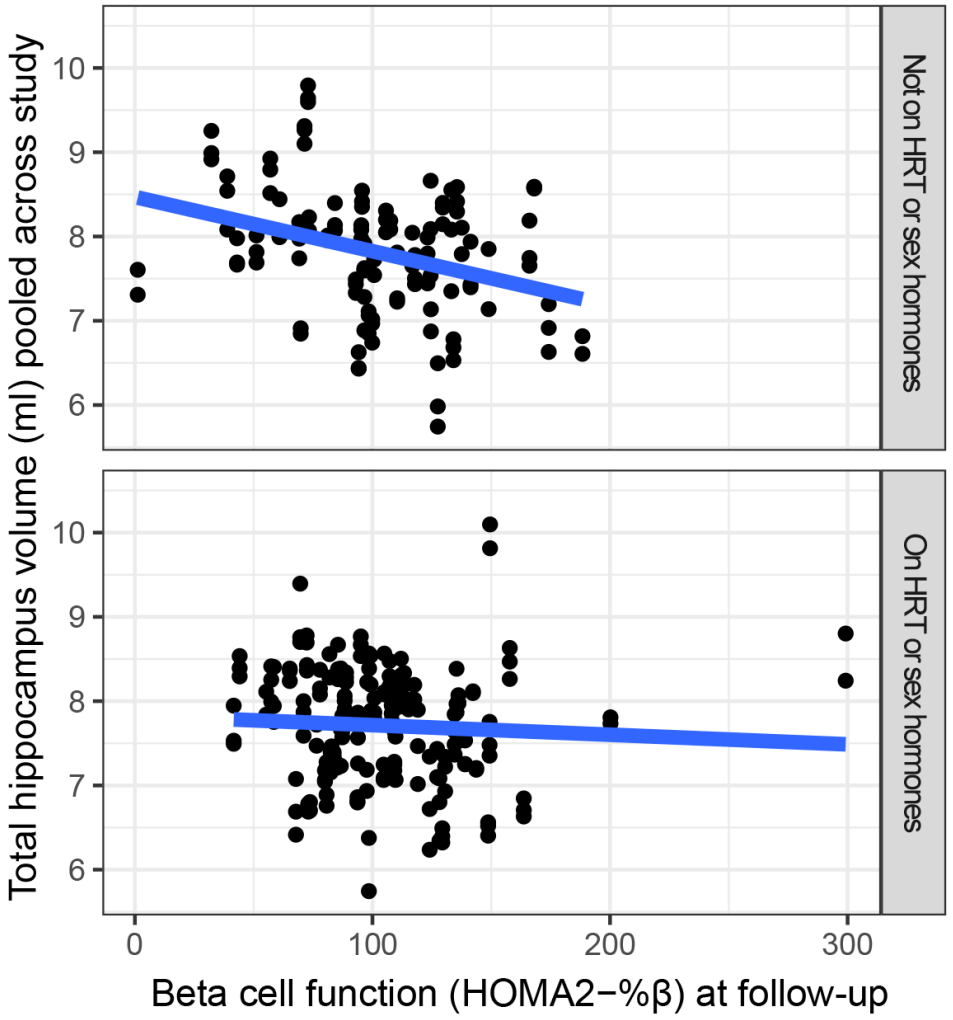


Image source: https://abm-website-assets.s3.amazonaws.com/laboratoryequipment.com/s3fs-public/embedded_image/2016/08/Hippocampus_1000x500.jpg

- Self-report hormone replacement therapy (**HRT-SR**)
- Medications (from PBS and self-report) two months prior to interview (**HRT-PBS**).
- Magnetic Resonance Imaging (MRI) data.
- Homeostatic model assessment (HOMA2[7]) from venous blood
- Hierarchical linear models

- **HRT-SR** was associated with smaller hippocampal volumes
- **HRT-PBS** was protective against hippocampal atrophy.
- There was no significant association between insulin function and hippocampus volume and atrophy, so HRT could not mediate the association.



This study did not support the hypothesis that insulin function mediates the effect of hormone replacement therapy on age-associated hippocampal atrophy.

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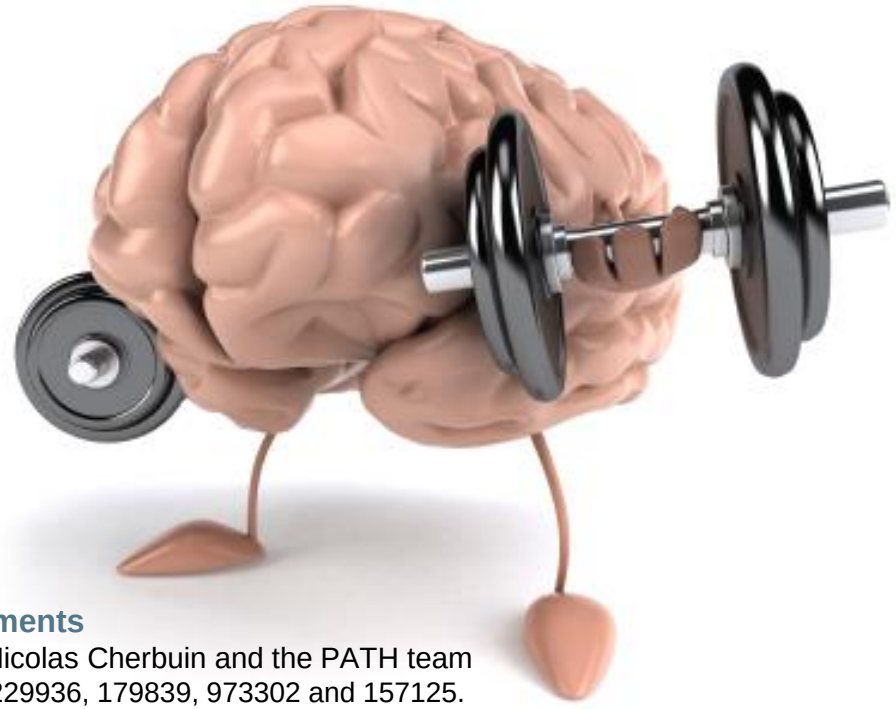

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