

Researchers find an evolutionarily preserved signature in the primate brain

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Researchers from Uppsala University, Karolinska Institute, and the University of Chicago, have determined that there are hundreds of biological differences between the sexes when it comes to gene expression in the cerebral cortex of humans and other primates. These findings, published June 20th in the open-access journal *PLoS Genetics*, indicate that some of these differences arose a very long time ago and have been preserved through the evolution of primates. These conserved differences constitute a signature of sex differences in the brain.

More obvious gender differences have been preserved throughout primate evolution; examples include average body size and weight, and genitalia design. This novel study focuses on gene expression within the cerebral cortex – that area of the brain that is involved in such complex functions in humans and other primates as memory, attentiveness, thought processes, and language.

The researchers measured gene expression in the brains of male and female primates from three species: humans, macaques, and marmosets. To measure activity of specific genes, the products of genes (RNA) obtained from the brain of each animal were hybridized to microarrays containing thousands of DNA clones coding for thousands of genes. The authors also investigated DNA sequence differences among primates for genes showing different levels of expression between the sexes.

"Knowledge about gender differences is important for many reasons. For example, this information may be used in the future to calculate medical

dosages, as well as for other treatments of diseases or damage to the brain," says Professor Elena Jazin of Uppsala University.

Lead author Björn Reinius notes that the study does not determine whether these differences in gene expression are in any way functionally significant. Such questions remain to be answered by future studies.

Source: Public Library of Science

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