

MICROSTRUCTURAL AND MOLECULAR SPECIALIZATIONS OF THE HUMAN BRAIN: COMPARISONS WITH OTHER APES

T.M. Preuss

Division of Neuroscience, Yerkes National Primate Research Center, Emory University, Atlanta, GA 30329 USA.

Presenter's Email: tpreuss@emory.edu

It is commonly supposed that mammalian brains are evolutionarily very conservative in internal organization, although differing greatly in size. Since human brains are dramatically larger than those of chimpanzees and other great apes, discussions of human brain evolution have focused on encephalization. There is now an abundance of evidence, however, that mammalian brains vary widely in their microscopic organization, spurring the search for human specializations of brain biochemistry, cell biology, and systems. This search involves comparing humans to apes and to other nonhuman primates, using noninvasive neuroimaging techniques and postmortem examination of tissue organization and gene expression. Current evidence suggests that thousands of genes are expressed differently in the cortex of humans and chimps, providing clues to previously unsuspected specializations of human brain biochemistry and physiology.

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