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## COMPLEX EVOLUTIONARY HISTORY OF FASTEVO IN HUMANS AND ITS ROLE IN BRAIN DEVELOPMENT

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One of the most fascinating topics in biology is the increase in relative brain size during primate evolution. Despite a long-standing interest in the genetic basis of human brain evolution, little is known about which genetic changes in the human lineage are responsible for the markedly altered brain phenotype. The search for genetic basis of our brain expansion has been relied on studies of brain malformations. In order to systematically survey brain genes which involved in human specific changes, we sequenced brain transcriptomes from a macaque brain. Among gene sequenced, we identified a gene, termed "FASTEVO" for the moment, which shows accelerated amino-acid change in human lineage. In addition, there are two distinct alleles which, according to molecular estimation, have been diverged for more than 5 million years cosegregated among different human populations indicating the presence of strong balancing selection. Functional analyses of FASTEVO showed that it is important for maintaining pluripotency of mouse embryonic stem cells and is necessary for neural stem cells formation as well as to preserve the undifferentiated state of the neuronal progenitor cells. We propose possible roles of this gene during brain development and human evolution.

Keywords: brain development, human evolution, balancing selection