

Regression and Simulation Models for Human and Baboon Brain Parameters

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Abstract

The variations in morphometric parameter of mammalian brains may be influenced by process of functional complexity, evolution and adaptation. Comparative analysis of linear measurements of cerebrum in the human and baboon has shown morphometric differences. In the present study linear measurements from human and baboon cerebrum (n=10 each) were used to predict various values for human and baboon brain and body parameters through multiple regression models. The average brain weights were found to be 2.08% and 0.84% of the body weights for humans and baboons respectively. The elasticity of regression models revealed that unit percentage increase in Occipital-Frontal (OF) distance would increase the human brain weight by 66.19%, while the baboon brain weight would increase by 7.63%. The unit percentage increase in the Height of Temporal Lobe (HTL) would increase the human brain weight by 16.28%, while the baboon brain weight would increase by only 0.28%. Unit percentage increase in Frontal-Temporal (FT) distance would decrease the human and baboon brain weights by 14.04% and 0.46% respectively. Inter-species values were also predicted through simulation techniques by using the ratios of model parameters with application of programming language Python. The OF, FT and HTL values for human were found to be 2.01 times, 1.55 times and 1.91 times respectively to that of baboon