

Making Sense of Cortical Folding

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Abstract

The folded surface of the cerebral cortex is the most striking superficial anatomical feature of the brain. It is well-known that the location of some important functional areas can be described in relation to certain major folds, but for large parts of the cortex the geometry of the folds is highly variable between individuals and functional areas cannot be reliably located in relation to them. Recent quantitative analyses of structural MRI data in a large group of subjects have clarified some important geometric principles. When the location of deepest parts of the inward folds, the sulcal pits, are examined, the pattern across the cortex is highly regular and correspondences between individuals generally become obvious. The deepest parts of the cortex are the first to develop in the foetus and are likely to be under close genetic control. The superficial folds are formed later in development and are likely to be subjected to much more variable biomechanical forces. These findings have implications for several areas of neuroscience and medical image computing.

Biography

Prof. Colchester is Professor of Clinical Neuroscience & Medical Image Computing University of Kent; East Kent and Guy's & St.Thomas's Hospitals