

Mathematical Models of Cortical Folding Process of the Human Brain

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The mechanism for cortical folding pattern formation is not fully understood. Existing biological hypotheses that try to explain this folding process are in disagreement with one other. Two competing biological hypotheses and corresponding biomathematical models of cortical folding that implement these hypotheses will be presented: (i) a chemical based hypothesis called the Intermediate Progenitor Hypothesis, and (ii) a mechanical based hypothesis called the Axonal Tension Hypothesis. Applications of these biomathematical models to cortical folding development and disease will be shown and directions of future research will be presented.