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Computerised Modelling for Developmental Biology

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Title: Computerised modelling for developmental biology : an exploration with case studies
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Many studies in developmental biology rely on the construction, simulation and analysis of models. This research presents a broad view of modelling approaches for developmental biology, with a focus on computational methods. An overview of modelling techniques is given, followed by several case studies. Using 3D reconstructions, the heart development of the turtle is examined, with special attention to heart looping and the development of the outflow tract. Subsequently, an ontology system is presented in which anatomical, developmental and physiological information on the vertebrate heart is modelled. Finally, two Petri net models are discussed, which model the developmental process of gradient formation, both in a qualitative and a quantitative manner.

Computerised modelling for developmental biology

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An exploration with case studies

Laura M.F. Bertens