

Spatio-temporal dynamics of structured populations - the growth of epidermis

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Majority of tissues building the human body consist of different type of cells. Recently the most interesting and the most important type of cells for biological and medical research and with promising clinical impact are stem cells. When the stem cells or other type of cells changing its function in tissue, we call this process as differentiation. In most cases there is more than one stage of differentiation means that the cell that already has differentiated may repeat this process once again and changed to the cell with different properties. This process is almost always non-reversible. Under this assumption the population of both stem cells and the all tyoes of cells that has transformed from them forms the structured population. To research and for better understanding the process of maturing - differentiating from stem cell to mature cell we try to develop the mathematical models decribing this biological process. As the main issue is to research the dynamics of structured populations. Those models are mainly constructed by stochastic, partial and ordinary differential equations. This work presents the primary version of the model with the discrete chain of maturation stages.