

Mathematical Analysis and Numerical Simulation of a Model of Morphogenesis Through Membrane-associated Non-receptors

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Morphogens (ligands) are the central keys in developmental biology. In early embryo development, morphogens are synthesized at signaling localized and diffuse to form gradient morphogen. When the morphogens are rapidly turned over we consider passive diffusion, which acts with the aid of other molecules. We focused in the mathematical model which is a particular case of the model proposed by Lei and Song (2013). We study the stationary solutions and numerical simulations to show the behavior of the solutions depending on the parameters values.

References

- [1] J. Lei, Y. Song, *Mathematical model of the formation of Morphogen Gradients through Membrane-Associated Non-receptors*, Bulletin of Mathematical Biology (2010) **72** 805–829.
- [2] A. D. Lander, Q. Nie, B. Vargas, and F. Y. M. Wan, *Aggregation of distributed in Morphogen Gradient Formation*, Studies in Applied Mathematics (2007) **114** 343–374.