Multiscale Analysis of a Carcinogenesis Model

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Using the periodic unfolding method, we shall analyze the macroscopic behavior of a non-linear system of partial differential equations describing some biochemical processes involved in the carcinogenesis in human cells.

We shall mainly focus here on some important phenomena arising in the carcinogenesis of living cells produced by *Benzo[a]pyrene* molecules. Various biochemical mechanisms, such as chemical reactions and diffusion processes occurring at the surface of the endoplasmic reticulum or binding and cleaning processes, described by suitable nonlinear functions, are taken into account in our model.

We shall extend some of the results contained in [1] and [2].

References

[1] I. Graf and M. A. Peter, *Homogenization of a carcinogenesis model with different scalings with the homogenization parameter*, Math. Bohemica **139** (2), 163–184, 2014.

[2] I. Graf and M. A. Peter, *Diffusion on surfaces and the boundary periodic unfolding operator with an application to carcinogenesis in human cells*, SIAM J. Math. Anal. **46** (4), 3025–3049, 2014.