

Cahn-Hilliard system: From nonlocal to local

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The cell-cell adhesion forces are known to maintain the tumor's compactness. In [2] it was derived a nonlocal model to describe the possible cell-cell adhesion mechanisms. In the formal limit of local interaction it was shown, both numerically and theoretically that the latter model preserves the diversity of cell-cell adhesion patterns seen in experiments. In this work we provide a rigorous mathematical framework to establish the limit of local interactions. When the parameter of the nonlocality goes to 0, the system tends to a Cahn-Hilliard system with degenerate mobility and cross-interaction forces. The proof is based on the strategy developed in [1] for the single Cahn-Hilliard equation.

References

- [1] C. ELBAR AND J. SKRZECZKOWSKI, *Degenerate Cahn-Hilliard equation: From nonlocal to local*, 2022.
- [2] C. FALCÓ, R. E. BAKER, AND J. A. CARRILLO, *A local continuum model of cell-cell adhesion*, To appear in SIAM J. Appl. Math.