

PRESSURE JUMP IN THE CAHN-HILLIARD EQUATION

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We model a tumor as an incompressible flow considering two antagonistic effects: repulsion of cells when the tumor grows (they push each other when they divide) and cell-cell adhesion which creates surface tension. To take into account these two effects, we use a 4th-order parabolic equation: the Cahn-Hilliard equation. The combination of these two effects creates a discontinuity at the boundary of the tumor that we call the pressure jump. To compute this pressure jump, we include an external force and consider stationary radial solutions of the Cahn-Hilliard equation. We also characterize completely the stationary solutions in the incompressible case, prove the incompressible limit and prove convergence of the parabolic problems to stationary states.