1050-92-154 **Pavel M Lushnikov*** (plushnik@math.unm.edu), University of New Mexico, MSC03-2150, Albuquerque, NM 87131, **Mark Alber**, University of Notre Dame, 255 Hurley Hall, Notre Dame, IN 46556, and **Nan Chen**, University of Notre Dame, Notre Dame, IN 46556. *Regularization of collapse in dynamics of biological cells.*

Biological cells interact through chemotaxis when cells secret diffusing chemical (chemoattractant) and move towards gradient of chemoattractant creating effective nonlocal attraction between cells. Macroscopic description of cellular density dynamics through Keller-Segel model has striking qualitative similarities with nonlinear Schrodinger equation including critical collapse in two dimensions and supercritical in three dimensions. Critical collapse has logarithmic corrections to $(t_0 - t)^{1/2}$ scaling law of self-similar solution. Microscopic motion of eucaryotic cells is accompanied by random fluctuations of their shapes. We derive a nonlinear diffusion equation coupled with chemoattractant from microscopic cellular dynamics in dimensions one and two using excluded volume approach. Nonlinear diffusion coefficient depends on cellular volume fraction and it provides regularization (prevention) of cellular density collapse. A very good agreement is shown between Monte Carlo simulations of the microscopic Cellular Potts Model and numerical solutions of the macroscopic equations for relatively large cellular volume fractions. (Received March 03, 2009)