1033-92-53 **Moongyu Park*** (mp0002@email.uah.edu), Department of Mathematical Sciences, University of Alabama in Huntsville, Huntsville, AL 35899. *Levy Motions and Evolution of Generic Information in Porous Media.*

Many researchers have studied cell scale phenomena of the movement of microbes in natural porous systems and the evolution of their genetic information. But the global effect has not been studied. Therefore, we have been developing upscaling procedures for motile particles in porous media with fractal functionality between upper and lower cutoffs and applied to Levy particles. On the micro scale, particle trajectories are the solution to an integrated stochastic ordinary differential equation (SODE) with Markov, stationary, ergodic drift subject to Levy diffusion. The Levy diffusion allows for self-motile particles. On the meso scale, the trajectory is the solution to an integrated SODE with Levy drift and diffusion arising from the micro scale asymptotics. Levy drift is associated with the fractal character of the Lagrangian velocity. On the macro scale, the process is driven by the asymptotics of the meso scale drift without additional diffusion. The upscaled dispersion equation contains a fractional derivative term. We compute the distribution of the first hitting position of stable Levy processes on an interval to model the microbes' attachment on biofilms in porous media. (Received August 27, 2007)