1020-35-47 **S P Hastings*** (sph@pitt.edu), Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260. *Conditions for transport in a model of molecular motors.*

Molecular motors are nanoscale mechanisms for transport of material within a cell. In joint work with D. Kinderlehrer and J. B. Mcleod, we study a model first presented by Chipot, Kinderlehrer and Kowalczyk. The model is a system of linear parabolic equations which include diffusion and transport terms and first order chemistry relating the unknowns. These unknowns are probability density distributions for motors binding at different sites along a microtubule. "No flux" boundary conditions are assumed. A previous paper, by Chipot, Hastings and Kinderlehrer, gave results for a two component model In this paper an n-component model is considered. Existence and positivity of a unique steady state solution is proved and it is shown that all positive solutions of the boundary value problem tend to this solution. Transport occurs during the approach to equilibrium. Most interestingly, conditions are given on the parameters in the problem which insure that the steady state is of the form which is required for transport. The proof that these conditions work is very different from the proof of Chipot, Hastings and Kinderlehrer, which was only for the two component model. (Received August 06, 2006)