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David Kinderlehrer* (davidk@andrew.cmu.edu), Dept. of Mathematical Sciences, Wean Hall, Carnegie Mellon University, Address 1, Pittsburgh, PA 15213. *Monge-Kantorovich mass transport for modeling systems and solving partial differential equations and systems.*

Questions in transport arising from cell biology and in chemistry present novel issues when modeled using mass-transport paradigms. A particular situation is that the equilibrium configuration does not correspond to an energy minimizer and thus the solution is not governed by a conventional entropy principal. Can we approach this in a physically meaningful way that also leads to the solution of the problem and in addition to the characterization of transport properties we expect the solution to have? We discuss these and other issues. (Received September 16, 2013)