1056-65-151 **Yekaterina Epshteyn*** (rina10@andrew.cmu.edu), Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213. *Chemotaxis and Numerical Methods for Chemotaxis Models.*

In this work, first we will discuss several chemotaxis models including the classical Keller-Segel model. Chemotaxis is the phenomenon in which cells, for example bacteria, and other single-cell or multicellular organisms direct their movements according to certain chemicals in their environment. In our work we propose a family of new interior penalty discontinuous Galerkin methods for the Keller-Segel chemotaxis model. The first step in the derivation of the proposed methods is made by introducing the new variable for the gradient of the chemoattractant concentration and by reformulating the original Keller-Segel model in the form of a convection-diffusion-reaction system. We then design interior penalty discontinuous Galerkin methods for the rewritten Keller-Segel system. Our methods employ the central-upwind numerical fluxes, originally developed in the context of finite-volume methods for hyperbolic systems of conservation laws. We prove error estimates for the proposed high-order discontinuous Galerkin methods. Our proof is valid for pre-blow-up times since we assume boundedness of the exact solution. Some numerical experiments to demonstrate the performance of the proposed methods and comparison with other methods will be presented. (Received September 04, 2009)