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**Cell Transport in Microchannel**[1] A.T. CONLISK, ZHIZI PENG, DANIEL HOYING, The Ohio State University — Cell transport through microscale channels occurs in many biomedical applications such as cell separation by magnetic/electromagnetic forces and cell injection in flow cytometry. Few studies have been performed to understand the motion of the cells as they travel through a microfluidic channel. The objective of this project is to model the velocity of the cells passing through a microfluidic channel under the action of both pressure driven and electrically driven flow fields. Two candidate models of cell transport will be considered. First, the cell transport will be modeled by considering it carried by Poiseuille or electroosmotic flow electrophoretically near walls. Second, the dilute cell population will be treated as a solute, and a general mass transport model will be developed. For realistic values of the channel dimensions and the cell diameter, the presence of the walls is expected to be a leading order effect. The relative magnitude of the various forces that can act on a cell moving in a microfluidic channel are also discussed. The differences between and the validity of the two models will be studied based on the values of the governing parameters. The results will be compared with experiments involving several lines of cancer cells.

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