

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Building a Theoretical Model of Bidirectional Transport. DMITRI PETROV, CLARE YU, STEVEN GROSS, University of California, Irvine — Intracellular transport system plays a role in many vital functions of a living cell. Most of the long range transport occurs on the microtubule based network. Cargos are propelled by two families of molecular motors of opposite polarity. Often both types of motors are present on a cargo and the transport is achieved by moving the cargo bidirectionally with net displacement in the desired direction. This implies a high degree of coordination inside the motor complex. Our goal is to gain an understanding of the mechanisms that are responsible for controlling and coordinating the activity of molecular motors. We attempt to achieve this goal by studying the tracking data of lipid droplets in a *Drosophila* embryo at different stages of development. We have developed a tool that interprets the tracking data as a series of regions of constant linear velocity. We believe that these regions correspond to different states of the motor complex and that a theoretical model of bidirectional transport can be developed by applying statistical methods to study these states and transitions between them.

Dmitri Petrov
University of California, Irvine

Date submitted: 28 Dec 2004

Electronic form version 1.4