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**Maria-Veronica Ciocanel\***, ciocanel.1@osu.mbi.edu, and **John Fricks, Peter Kramer** and **Scott McKinley**. *A renewal reward approach for studying intracellular transport models.*

Many biological agents transition between different biophysical states during movement. For example, proteins inside cells bind and unbind to and from cellular roads called microtubules, switching between bidirectional transport, diffusion, and stationary states. Since models of intracellular transport can be analytically intractable, asymptotic methods are useful in investigating the effective cargo transport properties as well as their dependence on model parameters. We consider these models in the framework of renewal processes and derive the effective velocity and diffusivity of cargo at large time for a general class of problems. We also illustrate applications of the proposed method to macroscopic models of mRNA localization in developing oocytes and microscopic models of processive cargo movement by teams of molecular motor proteins. (Received August 28, 2018)