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Central to cell function is the intracellular transport of biological materials constructed in and near the cell nucleus that must be delivered to destinations throughout the cell body. Among the key players in this process are biochemical molecular motors from the kinesin and dynein families. While experiments and early analysis have had success in studying the dynamics of such motors moving intracellular cargo individually, we will use techniques from SDE theory and stochastic averaging to analyze the behavior of motor-cargo complexes when multiple motors are working to move the same cargo. (Received September 22, 2010)