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The Transportation System Inside a Living Cell¹

CLARE YU², University of California, Irvine

A living cell has an infrastructure much like that of a city. We will describe the transportation system that consists of roads (filaments) and molecular motors (proteins) that haul cargo along these roads. This transportation system is essential for such diverse processes as neuronal function and mitochondrial transport. While there have been studies of how motors function at the single molecule level, and studies of the structure of filamentary networks, studies of how the motors effectively use the networks for transportation have been lacking. We will give an example showing that pigment cells regulate transport by controlling how often pigment granules switch from one filament to another, rather than by altering individual motor activity at the single molecule level, or by relying on structural changes in the network.

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²Collaborators: J. Snider, F. Lin, S. P. Gross (University of California, Irvine), N. Zahedi and V. Rodionov (Center for Biomedical Imaging Technology, Farmington, CT and Randall Centre for Molecular Mechanisms of Cell Function, King's College London)