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**Subcellular Nanoparticle Distribution from Light Transmission Spectroscopy** ALISON DEATSCH, NAN SUN, JEFFREY JOHNSON, SHARON STACK, CAROL TANNER, STEVEN RUGGIERO, University of Notre Dame — We have measured the particle-size distribution (PSD) of subcellular structures in plant and animal cells. We have employed a new technique developed by our group, Light Transmission Spectroscopy—combined with cell fractionation—to accurately measure PSDs over a wide size range: from  $\sim 10$  nm to 3000nm, which includes objects from the size of individual proteins to organelles. To date our experiments have included cultured human oral cells and spinach cells. These results show a power-law dependence of particle density with particle diameter, implying a universality of the packing distribution. We discuss modeling the cell as a self-similar (fractal) body comprised of spheres on all size scales. This goal of this work is to obtain a better understanding of the fundamental nature of particle packing within cells in order to enrich our knowledge of the structure, function, and interactions of sub-cellular nanostructures across cell types.

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