

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Nanoparticle Distributions in Cancer and other Cells from Light Transmission Spectroscopy ALISON DEATSCH, NAN SUN, JEFFERY JOHNSON, SHARON STACK, CAROL TANNER, STEVEN RUGGIERO, University of Notre Dame — We have measured the optical properties of whole cells and lysates using light transmission spectroscopy (LTS). LTS provides both the optical extinction coefficient in the wavelength range from 220 to 1100 nm and (by spectral inversion using a Mie model) the particle distribution density in the size range from 1 to 3000 nm. Our current work involves whole cells and lysates of cultured human oral cells and other plant and animal cells. We have found systematic differences in the optical extinction between cancer and normal whole cells and lysates, which translate to different particle size distributions (PSDs) for these materials. We have also found specific power-law dependences of particle density with particle diameter for cell lysates. This suggests a universality of the packing distribution in cells that can be compared to ideal Apollonian packing, with the cell modeled as a fractal body comprised of spheres on all size scales.

Alison Deatsch
University of Notre Dame

Date submitted: 05 Nov 2015

Electronic form version 1.4