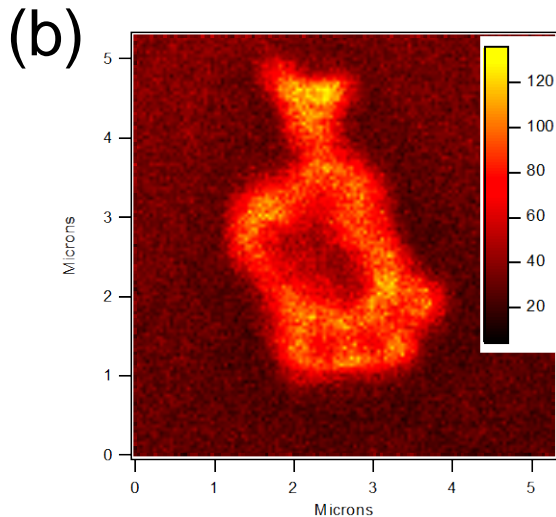
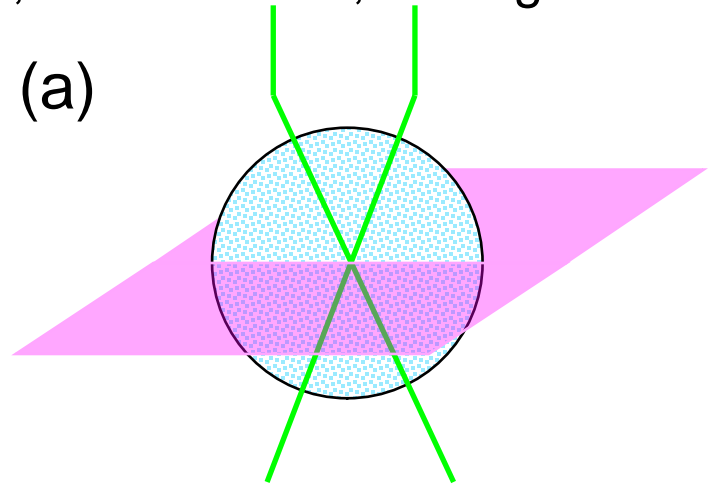


University of Maryland NSF MRSEC Highlight:

Loading up nanoporous carriers

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Porous micro and nanoparticles, materials with high internal surface areas, have many potential applications including separation media, sorbents, and drug delivery vehicles. A quantitative understanding of the diffusion of molecules within these novel materials is key for engineering specific functionality.



Here, confocal microscopy, a schematic of which is shown in (a), is used to obtain images of dye molecules (doxorubicin HCl) within micron sized alumina particles with pores on the order of 10 nanometers in diameter (b). Using the technique of optical sectioning, the loading of dye can be visualized in three dimensions, and information about internal structure can be obtained at the nanometer scale. Using dynamic measurements, the rate of transport of the molecules can be measured as a function of molecular and particle surface properties.