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Fluorescence Study and Analysis of Single-Walled Carbon Nanotubes Uptake by *Saccharomyces Cerevisiae*

Studies and developments in drug delivery have largely impacted the biomedical field. Nonetheless, concrete understandings of the delivery of drugs to target cells remain yet to be achieved. The goal for this project is two-fold: (i) to determine if yeast cells can uptake single-walled carbon nanotubes (SWCNTs) and (ii) to determine whether the method of uptake is dependent on endocytosis. SWCNTs are functionalized through oxidation in order to increase their solubility then tagged with fluoresce isothiocyanate (FITC) dye. The fluorescent characteristics of FITC functionalized SWCNTs provide visual evidence of uptake, or lack thereof, by strains of *Saccharomyces Cerevisiae* (JC9 and AN120) observed using epifluorescence microscopy. Images from epifluorescence microscopy analysis of incubated yeast cultures with functionalized carbon nanotubes will determine if the nanotubes successfully penetrate the cell wall of *Saccharomyces Cerevisiae*. To examine the method of uptake, END3 and LAS17 strains of *Saccharomyces Cerevisiae* deficient in endocytosis (mutant cells) are compared with wild-type strains. Uptake of FM Lipophilic Styryl dye (FM 4-64) is used as an endocytosis control. Evidence of penetration of SWCNTs across the cell membrane, or lack thereof, using endocytosis is provided by epifluorescence microscopy. Results will determine if functionalized carbon nanotubes are potential transporters for other molecules into *Saccharomyces Cerevisiae*.