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# The role of surfactant structure in the separation of single walled carbon nanotubes (SWCNTs)

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Single-chirality single walled carbon nanotubes (SWCNTs) have unique optoelectronic properties that can be utilized in specific applications, such as photovoltaics and biosensor. However, due to the large variety of SWCNTs and the difficulty of separation, the application of chiral SWCNTs is limited. The post-synthesis separation of SWCNTs has been studied with great interest in the past decade. The most promising techniques include the selective adsorption of SWCNTs onto hydrogel stationary phases and the aqueous two-phase extraction. The surfactant structure surrounding single walled carbon nanotubes (SWCNTs) plays an important role in their separation by nearly any method. However, characterizing the structure of these molecular layers remains difficult. The structure of the surfactant or other molecules around the SWCNTs could also have important implications in toxicology and drug delivery. Using our understanding of the surfactant structure surrounding SWCNTs, we developed high-fidelity separations of nanotubes by both selective adsorption and two-phase extraction. Finally, we will describe how these mono-chiral suspensions can be used in various applications.

## Biography

Kirk J Ziegler received his PhD in 2001 from the University of Texas at Austin. After a Postdoctoral position in Prof. Smalley's laboratory, he joined the Chemical Engineering Department at the University of Florida in 2005. His research group focuses on understanding the role of interfaces in one-dimensional nanostructures, such as single wall carbon nanotubes (SWCNTs) and vertical arrays of nanowires. His work on SWCNTs has focused on understanding the effect of surfactant-nanotube interactions on dispersion and separation processes. The ability to control these interfaces allow for efficient separation of SWCNTs and their integration into composite structures.

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