Self-assembled diphenylalanine nanowires for cellular studies and sensor applications.

In this paper we present a series of experiments showing that vertical self-assembled diphenylalanine peptide nanowires (PNWs) are a suitable candidate material for cellular biosensing. We grew HeLa and PC12 cells onto PNW modified gold surfaces and observed no hindrance of cell growth caused by the peptide nanostructures; furthermore we studied the properties of PNWs by investigating their influence on the electrochemical behavior of gold electrodes. The PNWs were functionalized with polypyrrole (PPy) by chemical polymerization, therefore creating conducting peptide/polymer nanowire structures vertically attached to a metal electrode. The electroactivity of such structures was characterized by cyclic voltammetry. The PNW/PPy modified electrodes were finally used as amperometric dopamine sensors, yielding a detection limit of 3.1 µM.