

## Novel Nanotechnology Water Filters

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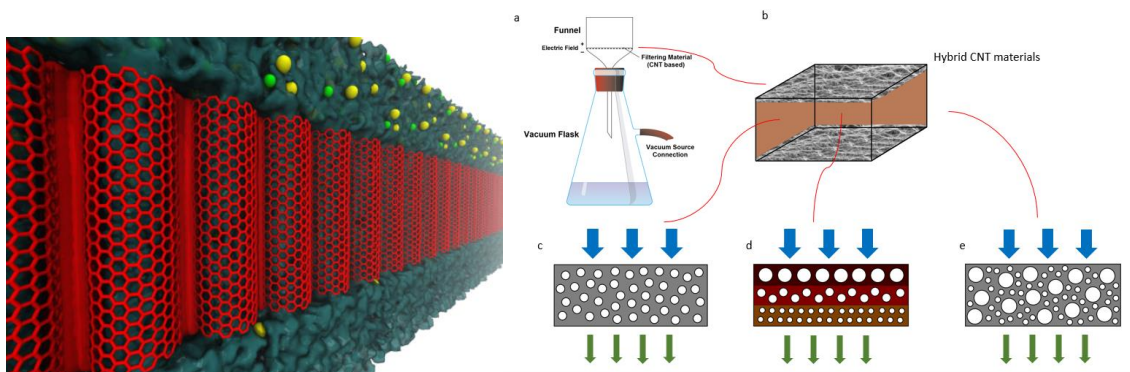
Nanoscale materials such as carbon nanotubes (CNT) are emerging as candidate materials for water filtration. Due to the large surface area and capability of being surface functioned, CNT materials demonstrate exceptional efficiency of pollutant removal.

CNT materials can be used as grown or functioned to filter a wide variety of pollutants. However, manufacturing and cost are the factors preventing use of CNT in filters. With the progress in CNT manufacturing such as the catalytic chemical vapor deposition in fluidized bed, the cost is reducing.

At UC Nanoworld Lab, a novel approach is being experimented targeting at high output, low cost CNT material assembling for various applications including water filtration. To achieve high efficiency water filtration, the CNT filtration media can have varying porosity in stratified structure as opposed to uniformly structured filters. The porosity increases from top to bottom of the filter, reducing the chance of clogged surface layer. Proper manufacturing and post processing of CNT yarn is the key to make such stratified filter structure.

Using combinations of CNT/conventional filter may reduce the cost of using CNT in filtration while still achieving superior filtration effectiveness. In a novel gaseous manufacturing process, conventional filter material can be well integrated with CNT, forming hybrid CNT materials. The CNT materials is packed together with other filter media particles such as activated carbon and catalytic particles. The hybrid filter media could improve efficiency, capacity and may target wider spectrum of contaminants.

In this Protégé project, the student will main work on testing the nanotechnology water filter with a group of materials engineers and mechanical engineers.



CNT Hybrid Materials\* and Testing CNT Based Filter

(\* Illustration by <https://genesisnanotech.files.wordpress.com>)

