Popularized science summary

Chemistry is an important part of our daily lives, and it is filled with plenty of intricate processes and mechanisms.

Some of use might recall from our chemistry classes that the more a compound and a solvent are alike, the more likely the compound is to be dissolved in the solvent. This statement holds true in many situations found throughout chemistry and may unfortunately lead to issues when dealing with, say dirty laundry.

As we use water in our laundry machines, which isn't the best at dissolving dirt and oils present on our clothes, molecules called surfactants are often introduced to help cleaning the clothes. But there are times in which adding surfactants to increase solubility of compounds is a bad idea and alternatives need to be found. One such example is when we want to introduce medicine into the human body.

Every living person consists of trillions of cells, and cells have a wall consisting of a lipid bilayer. A lipid is a fatty acid, which is what our vegetable oils are made of, and we can observe that water and oil don't mix. The same can be said for many potential medicinal substances and with our blood being about 50% water, there is a need to help these molecules move in our blood.

One way of doing this is to encase the compound of interest in a host in order to allow it to move in a so-called nanotube. With the aid of suitable nanotubes substances possessing great medicinal properties, but poor solubilities, may be administrated in various treatments instead of ending up stranded against the wrong cell wall…

In this work, nanotubes are built using molecules based on the near 90º, V-shaped Tröger's base as a source of inspiration and, by fusing four of them together, hope to form a nanotube useful for transporting medicine and other interesting applications involving transport.