New knowledge of cannabis paves the way for drug development

September 8 2014

Revolutionary nanotechnology method could help improve the development of new medicine and reduce costs. Researchers from the Nano-Science Center and the Department of Chemistry at the University of Copenhagen have developed a new screening method that makes it possible to study cell membrane proteins that bind drugs, such as cannabis and adrenaline, while reducing the consumption of precious samples by a billion times.

About 40% of all medicines used today work through the so-called "G protein-coupled receptors". These receptors react to changes in the cell environment, for example, to increased amounts of chemicals like cannabis, adrenaline or the medications we take and are therefore of paramount importance to the pharmaceutical industry.

"There is a lot of attention on research into "G protein-coupled receptors", because they have a key roll in recognizing and binding different substances. Our new method is of interest to the industry because it can contribute to faster and cheaper drug development", explains Professor Dimitrios Stamou, who heads the Nanomedicine research group at the Nano-Science Center, where the method has been developed. The new method is described in a publication at the esteemed scientific journal *Nature Methods*.

Cheaper to test and develop medicine

The new method will reduce dramatically the use of precious membrane protein samples. Traditionally, you test a medicinal substance by using small drops of a sample containing the protein that the medicine binds to. If you look closely enough however, each drop is composed of thousands of billions of small nano-containers containing the isolated proteins. Until now, it has been assumed that all of these nano-containers are identical. But it turns out this is not the case and that is why researchers can use a billion times smaller samples for testing drug candidates than hitherto.

"We have discovered that each one of the countless nano-containers is unique. Our method allows us to collect information about each individual nano-container. We can use this information to construct high-throughput screens, where you can, for example, test how medicinal drugs bind G protein-coupled receptors", explains Signe Mathiasen, who is first author of the paper describing the screening method in *Nature Methods*. Signe Mathiasen has worked on developing a screening method over the last four years at the University of Copenhagen, where she wrote her PhD thesis research project under the supervision of Professor Stamou.

More information: www.nature.com/nmeth/journal/v …

full/nmeth.3062.html