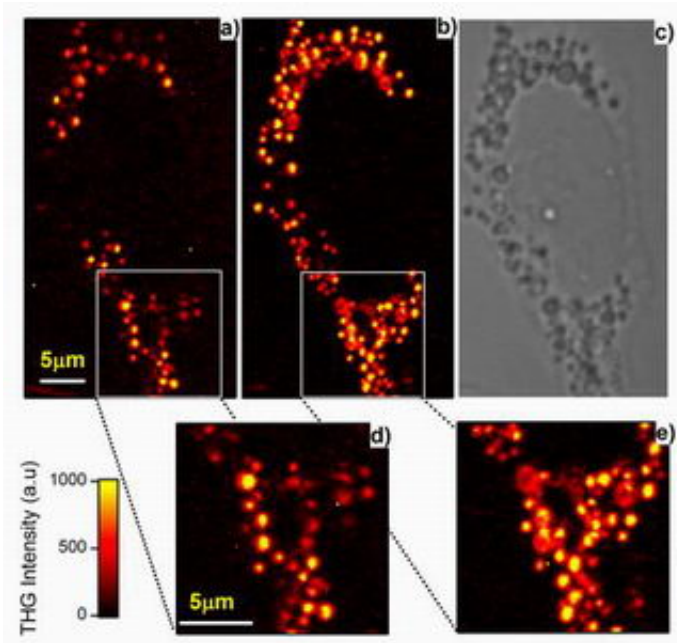


Molecules Under Hammer

February 13 2007



Lipid droplets in a cell. Credit: NWO

How do you get information from a preparation that is transparent? How can you still see a three-dimensional image through a microscope? Dutch researcher Rajesh S. Pillai investigated a new way of illuminating preparations under the microscope. For example, he could investigate the microstructure of food, which is important for the taste and shelf-life.

Furthermore, this technique is highly promising for research into how fat is stored in the human body.

Images can only be made under the microscope if the preparation is illuminated. Sometimes using a single lamp is not enough, for example when a three-dimensional image of a transparent sample is needed. In this project Pillai used a laser that emitted extremely short pulses of infrared light. These pulses cause molecules to respond as if they have been hit very shortly but very hard with a hammer, as a result of which they emit light of exactly three times the frequency of the incoming light. By measuring this light, Pillai obtained the information sought. The blow with the hammer so to speak happens so quickly that the molecules are not permanently damaged.

During his studies the researcher examined the microstructure of food in cooperation with Unilever. This structure is vitally important for both the shelf-life and taste of the products.

Further the technique was used to visualise lipid droplets in cells. These droplets are the fat storage depots in our bodies. A number of very prevalent diseases are related to disruptions in the formation and breakdown of lipid droplets. A follow-up project must shed more light on these highly-promising results.

Source: NWO

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