Structure of hepatitis B virus mapped

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Using a newly developed method, Utrecht University researchers have mapped the structure and composition of the hepatitis B virus. The researchers were able to map the structure by spraying the virus.

Their research brings us a step closer to understanding and combating hepatitis B infection. The method can also be used to analyse other viruses. The results of the search were recently published in two renowned scientific journals: *Proceedings of the National Academy of Sciences USA* and *Angewandte Chemie International Edition England.*

To better understand and deal with viral infections, it is essential to examine the virus carefully at molecular level. However, the virus is too large to do this using the standard methods. For that reason, especially for this project, Utrecht University researcher Charlotte Uetrecht developed a modified mass spectrometer that can spray the virus intact. She did this together with Prof. Albert Heck (Utrecht University) and researchers from America and Amsterdam.

Using the modified mass spectrometer, the researchers looked at the structure and composition of the hepatitis B virus, a virus that causes severe liver ailments in humans. With the spectrometer, the researchers not only observed various forms of the virus, but they also saw the virus' molecular structure. This makes it possible in the future to block the production of viruses, and in that way to combat viral infection. The technology developed can also be used to map and identify other viruses, such as viruses that can potentially be used in weaponised form by terrorists.

Mass spectrometry is a technology with which scientists can identify molecules. Among other things, this technology is used in dope testing and for identifying paint traces in forensic investigations. Mass spectrometry works particularly well with smaller molecules. Viruses however are a million times greater in mass. To be able to use mass spectrometry nevertheless, researchers spray the virus with water through a high-tension electric charge. This technique separates the viruses from the water, enabling researchers to examine them individually. This spraying process is comparable to the transmission of a cold virus by sneezing.

Source: Utrecht University