

Thousands of unknown antigens identified

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Researchers of Utrecht University, Intravacc and the National Institute of Public Health and Environmental Protection used a new method to identify hitherto unknown peptide antigens. This type of antigen had long been searched for, as they may be the starting points for new vaccines and cancer immunotherapy. The results of their research were published in *PNAS* last week.

"With this new method, we can identify more than twelve thousand peptide antigens, whereas before, we could only see the tip of the iceberg," explains immunologist Dr Cécile van Els of the National Institute of Public Health and Environmental Protection (RIVM). The new method, developed by the group of Albert Heck at the Science Faculty of Utrecht University, is not only much more sensitive, but also makes more routine research possible.

Complete picture

Peptide antigens are small pieces of proteins on the outside of cells that can be used to distinguish "good" from "bad" cells, which then may be cleared by the immune system. Bad cells in this context are infected with a virus or bacteria, or cells that are deformed, such as [cancer cells](#).

It is of vital importance for the development of vaccines and cancer immunotherapy to know which antigens alert the immune system. Up till now, it was not possible to get a complete picture of this process. In the best case, only a few hundreds of peptide antigens could be identified. But now, the researchers detected 12,000 of them, close to what is expected to be the maximum.

Cancer immunotherapy

The new method is also a very powerful technique for demonstrating the subtle differences between healthy cells and damaged cells, according to PhD candidate Geert Mommen of Intravacc. Of the twelve thousand peptide antigens, there are maybe a few dozen damaged ones that actually deviate from or are completely different from healthy cells. Researchers have found more proof that these deviating or unique peptide antigens are best equipped to prepare our immune system for the fight against cancer.

"Currently, a lot of research is being conducted into [cancer immunotherapy](#)," adds Heck. "Science has even called this the breakthrough of the year 2013, but in actual fact, the therapy is still in its infancy. The good thing about immunotherapy is that it does not destroy or damage [healthy cells](#). With our new method, researchers will obtain significantly more information about our [immune system](#). We hope that this information will help them with the further development of cancer treatment."

More information: Expanding the detectable HLA peptide repertoire using electron-transfer/higher-energy collision dissociation (ET_hcD)
Geert P. M. Mommen, Christian K. Frese, Hugo D. Meiring, Jacqueline van Gaans-van den Brink, Ad P. J. M. de Jong, Cécile A. C. M. van Els, Albert J. R. Heck, *PNAS*, Monday 10 March, doi 10.1073

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