

Mathematical model identifies genes which battle hepatitis C

Joint research by Dr. Leonid Brodsky, of the Institute of Evolution of the University of Haifa, and Dr. Milton Taylor, of Indiana University, led to the discovery of a mathematical method which can identify which genes in our bodies conduct the battle against the various viruses that attack us. In their research, they identified 37 genes out of 22,000 possible genes which fight the hepatitis C virus.

"When we know which genes are responsible for fighting the viruses which attack our liver, we will be able to look for the medications which will activate these genes most favorably," said Dr. Brodsky. The team conducted clinical trials, supported by the Health National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the US National Institutes of Health (NIH), which included 400 patients at eight different centers in the United States. The results will be published in the prestigious journal PLOS ONE.

The hepatitis C virus, found mostly among many patients who have had a blood transfusion or who share needles, attacks the liver and in extreme cases can cause cancer of the liver. At present, there is one well know medication, interferon, used to treat the virus; however, while some patients respond to the treatment with interferon, others do not. In this research, the clinical study was combined with the mathematical model developed by Dr. Brodsky. The study identified 37 genes which are key for patient response to treatment.

"In the specific case of hepatitis C, we have now isolated the genes that show which patients will respond to treatment. Until now, all patients received treatment for an extended period of time without knowing whether or not they would respond. In the future, we hope to find other medications that will be more effective in activating all of the 37 genes." summarized Dr. Brodsky.

He further explained that this mathematical model is not limited to identifying the genes which fight viruses that attack the liver. It can also be applied further in the fields of medicine, biology and agriculture.

Source: University of Haifa

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