Team develops psoriasis drug

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Ben-Gurion University of the Negev (BGU) researchers, in collaboration with Teva Pharmaceutical Industries Ltd., have developed a promising drug candidate to treat psoriasis. The finding was reported in a new paper published in *Chemistry and Biology*.

Psoriasis is a chronic, non-contagious disease characterized by inflamed lesions covered with silvery-white scabs of dead skin. An auto-immune disease, psoriasis affects at least four million Americans. It is caused by the disturbance in the natural balance between pro-inflammatory signals and signals that inhibit inflammation.

One of the key signals involved in the progression of psoriasis is the immune system protein Interleukin 17 (IL-17). The research team developed a method to inhibit IL-17 pro-inflammatory signals and proved that their engineered receptor, IL-17R, is highly effective in reducing IL-17 induced inflammatory signals in mice models. Moreover, injection of the receptor into a mouse model with acute human psoriasis eliminated the symptoms, essentially curing the disease.

"Using directed evolution to improve the properties of the IL-17 receptor, we have created engineered mutants that might prove there is a viable treatment for patients with severe psoriasis that do not respond to current drugs," explains Dr. Amir Aharoni, one of the researchers in BGU's Department of Life Sciences and the National Institute for Biotechnology in the Negev.

"Since the directed evolution method can be applied to other receptors

involved in autoimmune diseases and cancer, I believe that we are just starting to unravel the potential of this approach," Aharoni adds.

Directed evolution is an iterative Darwinian optimization process used in protein engineering whereby the fittest variants are selected from a collection of random mutations. Improved variants are identified and isolated by screening or selection for the property of interest. This approach is particularly advantageous in cases in which no prior knowledge of a protein's mechanism and structure is available.

The other researchers credited in "Directed Evolution of a Soluble Human IL-17A Receptor for the Inhibition of Psoriasis Plaque Formation in a Mouse Model" are BGU's Dr. Marianna Zaretsky and Teva researchers Dr. Liora Sklair-Tavron, Dr. Joel Kaye and Revital Etzyoni.

Provided by American Associates, Ben-Gurion University of the Negev