

OSU finds new compound that could treat autoimmune diseases

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(Medical Xpress)—Scientists at Oregon State University have discovered a chemical compound that could be a safer alternative for treating autoimmune diseases.

Although studies in humans are still needed, the finding could bring hope to people suffering from conditions caused by their immune system attacking their bodies. Autoimmune diseases can affect almost any part of the body resulting in diseases such as colitis, multiple sclerosis and psoriasis.

"We mostly treat [autoimmune diseases](#) with high-dose corticosteroids or cytotoxic drugs to suppress the [immune response](#), and the side effects can be very difficult to deal with," said lead researcher Nancy Kerkvliet. "But if this chemical works in clinical studies, it could result in a safer alternative to conventional drugs."

Kerkvliet collaborated with OSU professor Siva Kumar Kolluri and other colleagues who tested thousands of [chemical compounds](#) and found that one of them, 10-Cl-BBQ, binds to a protein called the aryl hydrocarbon receptor (AhR) inside T cells, which are essential white [blood cells](#). They found that the chemical and AhR then pass into the nucleus and change the cells into regulatory T cells (called Tregs), which shut down the immune response.

Kerkvliet said 10-Cl-BBQ is different from other treatments used to suppress the immune system because it acts directly in the T cells to turn

them into regulatory T cells. She believes this will result in fewer side effects than currently used drugs. The scientists also discovered two other compounds in the benzimidazoisoquinoline (BBQ) family that induced regulatory T cells.

The researchers tested 10-Cl-BBQ in mice that had graft-versus-host disease, a condition in which the [immune system](#) tries to eliminate foreign cells. The disease can occur in humans when they receive stem cell or [bone marrow transplants](#). The scientists found that daily injections of 10-Cl-BBQ completely suppressed the disease.

The compound was rapidly metabolized and excreted and wasn't toxic at the dosage used, thereby making it a potential candidate for drug development, said Kerkvliet, a professor of immunotoxicology in OSU's Department of Environmental and Molecular Toxicology in the College of Agricultural Sciences.

On a cellular level, the chemical works like the notorious environmental contaminant that's known as TCDD, a type of dioxin. But the chemical doesn't have the harmful [side effects](#), Kerkvliet said. TCDD is perhaps best-known for its presence in the jungle-defoliating Agent Orange herbicide used during the Vietnam War. Kerkvliet has spent most of her career studying how the dioxin suppresses immune responses.

"We spent all these years studying dioxin because people have been concerned about its presence in the environment," she said. "Yet, look what we have now discovered from those basic toxicology studies."

More information: The full paper is available online: ir.library.oregonstate.edu/xmlui/handle/1957/46244

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