

# Research findings offer hope for treatment of inflammatory skin condition

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People diagnosed with an inflammatory skin condition known as granuloma annulare (GA) develop raised red lesions that emerge in ring-like patterns on the skin. For those with a chronic condition, these

lesions can cover much of the body and degrade their quality of life.

Until now, however, there has been no well-established treatment for the [skin](#) condition and limited research into its causes.

Writing in the *Journal of Allergy and Clinical Immunology*, Yale School of Medicine researchers describe both the underlying drivers of the disease and a treatment that showed remarkable success in five patients with severe cases of GA, in which lesions covered up to 40% of their bodies.

The study was led by Dr. William Damsky, assistant professor of dermatology and dermatopathology, and Dr. Brett King, associate professor of dermatology.

"The condition hasn't been thoroughly investigated using newer approaches until now because it's often considered mostly a cosmetic issue," said Damsky. But as a physician who treats patients with GA, Damsky has seen just how difficult it is for them to live with this condition and just how much it affects their well-being.

He and King knew there had to be a more effective way to treat these patients.

Using single-cell RNA sequencing technology they studied [individual cells](#) extracted from lesions of patients with GA. They discovered that two cytokines, or small proteins—interferon gamma and oncostatin M—appeared to work together to alter cells known as fibroblasts, which form the protein structure beneath the surface of the skin, driving up inflammation. This impairment of the extracellular matrix production is a hallmark of GA.

"We now better understand the signals [the aforementioned cytokines]

that lead to the disorder and can choose medications more likely to be effective," Damsky said.

With this knowledge, the researchers tested a drug called tofacitinib, an anti-inflammatory medication approved for [rheumatoid arthritis](#) and [inflammatory bowel disease](#) known to inhibit these cytokines at the molecular level. The five patients, all of whom had struggled with GA with little relief for many years, were treated with the drug and saw remarkable improvement, Damsky said. In three cases, the patients' skin completely cleared.

"The improvement has been life-changing," said Damsky. "Patients can now feel good about wearing shorts and short-sleeved shirts in public, things most of us take for granted."

Although the researchers were able to treat only five patients during this trial, Damsky said the research has elicited interest from people across the country. He is currently planning a larger trial.

"We showed that there is a very viable treatment approach for patients with this disorder," he said.

Provided by Yale University

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