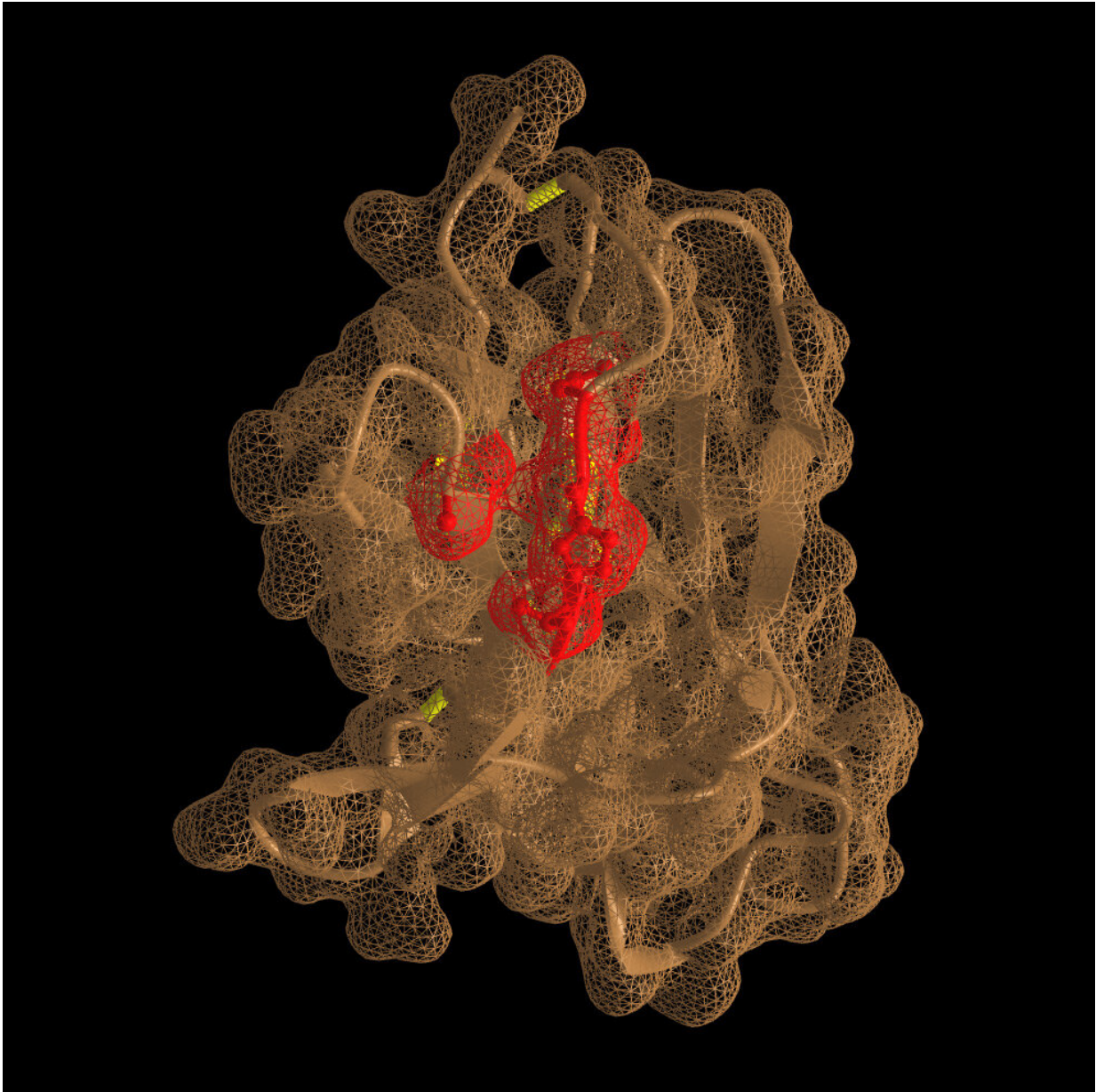


# Pumping the brakes on autoimmune disease

June 5 2023

---



This visualization shows BTLA being recognized by the antibody LY3361237.

Credit: Carl Ware/Sanford Burnham Prebys

Researchers at Sanford Burnham Prebys, collaborating with scientists from Eli Lilly and Company, have revealed the structure and function of a drug called LY3361237, which can reduce the harmful activity of the immune system to help treat autoimmune diseases. Their work laid the foundation for a new treatment that's currently in a Phase 2 clinical trial for lupus, an autoimmune disease affecting multiple organs in the body. The study is published in *Structure*.

The findings could also help scientists discover more drugs that target the [immune system](#), a rapidly growing area of biomedical research.

"It's miraculous that we can change the activity of the immune system with drugs, but we're still at an incredibly early stage in terms of figuring out how this works," says Professor Carl Ware, Ph.D. "The drug we describe in this study is an antibody that has shown promise in initial clinical trials, but understanding how it works on a [molecular level](#) will help scientists discover even more ways to modify the immune system to treat autoimmune diseases."

Autoimmune diseases occur when the immune system attacks the body. There are more than 80 known autoimmune diseases, and researchers estimate that about 5–10% of the population is affected by these diseases. Some well-known examples include rheumatoid arthritis, psoriasis and lupus.

"Immunological disorders are a major unmet medical need," says Ware. "Some can be managed effectively, but most of these diseases have limited [treatment options](#), so many people just have to learn to live with the symptoms."

The newly published study is the culmination of a long-standing collaboration between Sanford Burnham Prebys and Eli Lilly and Company. Their goal was to find a way to temper the activity of the immune system in autoimmune diseases. They were able to discover that LY3361237 can rebalance the immune system to prevent it from attacking the body.

The drug works by activating a chemical messenger in the immune system called BTLA, which is a major focus of Ware's research. In healthy people, BTLA is an immune checkpoint—a brake for the immune system to stop it from continuing to fire once an infection is under control. However, in people with autoimmune diseases, this brake never engages, so the immune system doesn't know when to slow down.

"LY3361237 is the first antibody drug that's known to increase the activity of BTLA to inhibit the immune system, which means it has extraordinary potential as a therapy for [autoimmune diseases](#)," says Ware.

The drug produced by Lilly entered a [Phase 1 clinical trial](#) in healthy subjects in 2018, and began recruiting patients with lupus for a [Phase 2 trial](#) in 2021. This trial will evaluate the efficacy and safety of the new treatment and is expected to be completed in two to four years.

In the meantime, the recently published study in *Structure* can provide a treasure trove of information for researchers studying the molecular biology of the immune system, which could help drive the discovery of more potential therapeutics for immunological diseases.

**More information:** Carl F. Ware, Epitope Topography of Agonist Antibodies to the Checkpoint Inhibitory Receptor BTLA, *Structure* (2023). [DOI: 10.1016/j.str.2023.05.011](https://doi.org/10.1016/j.str.2023.05.011). [www.cell.com/structure/fulltext... 0969-2126\(23\)00166-1](https://www.cell.com/structure/fulltext/S0969-2126(23)00166-1)

Provided by Sanford Burnham Prebys Medical Discovery Institute

Citation: Pumping the brakes on autoimmune disease (2023, June 5) retrieved 2 May 2024 from <https://medicalxpress.com/news/2023-06-autoimmune-disease.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.