

# Commandeering the Immune System Using Small-Molecules



David Spiegel  
Professor, Chemistry and Pharmacology

## CURRENT RESEARCH

### Treating Incurable Diseases Using New, Chemical Approaches

Dr. David Spiegel oversees one of the few labs in the world that integrates fundamental organic chemistry with cellular and molecular immunology. His lab performs essential functions that bridge academia and industry by envisioning entirely new ways that drugs can function, and by treating patients suffering from a wide range of diseases. His goal is to create molecules that use the body's immune system, instead of toxins, to treat diseases such as cancer and HIV. Unlike available treatments, these molecules can function virtually without side-effects, and also induce long-lasting immunity to a particular disease, even after the drug is removed. Dr. Spiegel's synthetic small-molecules alter the function of natural human antibodies, mimic the function of antibodies, modulate the innate immune system, and reduce inflammation. In short, he comes up with ideas that pharmaceutical companies would never dare to try. Over a very short time-frame, Dr. Spiegel has proved the success of his small-molecules and has moved them to advanced-stage pre-clinical trials. He has all of the tools and expertise needed to develop ideas through the entire pipeline, from chemical structures on a chalkboard to a therapeutic lead with a novel mechanism of action. Dr. Spiegel's work is treating the immune system with small-molecules in completely new ways, killing cancer and other diseases with far fewer side effects than traditional methods.

The focus of research activities in the Spiegel Laboratory is on the development of novel, chemistry-driven strategies for controlling and/or creating human immunity. The lab is led by Dr. David Spiegel, Professor in the...

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## AFFILIATION



Yale University

## EDUCATION

- Ph.D., in Organic Chemistry, 2005, M.D., 2004, M.S., in Pharmacology, 2000, Yale University
- A.B. in Chemistry, Magna Cum Laude with highest honors in Chemistry, 1995, Harvard University

## AWARDS

- American Chemical Society Committee on Science Young Investigator Award, 2013
- Department of Defense CDMRP Breast Cancer Era of Hope Scholar Award, 2013
- ACS Medicinal Chemistry Young Investigator Award, 2012
- Bristol-Myers Squibb Innovation Award, 2012
- Novartis Early Career Award in Organic Chemistry (one of two recipients worldwide), 2011
- and 7 more...

## RESEARCH AREAS

Technology, Chemistry

## FUNDING REQUEST

Your contributions will lead to the development of new approaches for using our own immune system to treat a variety of diseases, especially those with no current treatment options. These include various cancers, viral and bacterial illnesses (e.g., HIV, ebola, dengue), and autoimmune disease. Funding will enable Dr. Spiegel to develop fundamentally new treatment approaches to these conditions, which can offer hope to patients, and ultimately lead to personalized medicine.