

# A new open-access portal for human immunology data and tools

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TEA-seq single panel cell type data from Human Immune System Explorer.  
Credit: Zach Thomson/Allen Institute

Researchers at the Allen Institute for Immunology have been busy. Since the division of the Allen Institute launched in late 2018, the 60-person team of immunologists, molecular and computational biologists, engineers and other staff have been setting up a new way of doing research to handle a massive trove of data that's now wending its way through experiments and analysis: long-term studies of how the immune system changes, responds or fails to respond in the course of a healthy human life or during immune-related diseases.

Now, the division has built a new online portal for all to explore the details of their work and, eventually, the health and disease-related human data as well.

Launched today, the Human Immune System Explorer is the Allen Institute for Immunology's data-sharing portal to the broader community. Built using de-identified and anonymized data, the site allows scientists to delve into the methods and resources the immunology team is using to analyze and manage their studies on human immunology. As the team's [long-term studies](#) of immune health and diseases are completed, those data will be deposited on the public portal as well. The researchers hope that by making their data available to the public, others in the [scientific community](#) will comb through the data to make their own insights about human immunology that could eventually lead to better, more precise therapies for immune-related diseases.

As the immunology team established a specialized process, also called a research pipeline, to carry out multi-year studies of human immune health and disease, including studies of the immune system in COVID-19, cancer, and autoimmune disease, they realized they needed to develop new methods to study the immune system and analyze the resulting data. As they are continuing to follow healthy and patient volunteers for two or more years, the first public release on the open-access platform contains data and tools related to these newly developed

methods. Data from the long-term studies themselves will be released on the public portal in the years to come.

The first public release includes:

- Protocols describing the team's research pipeline, which captures and integrates five different kinds of molecular data about the human immune system from the same person over time, in addition to [clinical data](#)
- A new method and accompanying data visualization app called TEA-seq, which captures three types of data simultaneously from individual human immune cells: proteins present on the cells' surfaces; the set of genes switched on or expressed in each cell; and the cell's "epigenetic" landscape, which gives clues as to how its genes are regulated
- Data and an accompanying interactive visualization of the team's findings that delays in processing human blood samples changes certain molecular properties of the immune cells (this finding led the team and their external collaborators to standardize rapid processing of blood samples after they're taken from study volunteers)
- A new method and accompanying data visualization app dubbed PALMO (Platform for Analyzing Longitudinal Multi-Omics data) to analyze longitudinal, multi-omics data—meaning data that captures multiple kinds of information, such as genome-wide gene activity or whole-cell protein levels, from thousands or more single cells, in samples gathered from patients over several points in time.
- A package of computational methods, known as BarWare, that tracks the original source of individual cells mixed together in the same experiment, and unmixes them for analysis.

"Since day one of the Allen Institute for Immunology, we always had a

plan to share our research data openly, but perhaps more importantly, how we derive that data," said Tom Bumol, Ph.D., Executive Vice President and Director of the Allen Institute for Immunology.

"This first access to the Human Immune System Explorer is really a window into what we're building. Right now, it illustrates some of the techniques and computational environment we're using to tackle this big, difficult problem of understanding human [immunology](#)."

**More information:** Human Immune System Explorer:  
[explore.allenimmunology.org/](https://explore.allenimmunology.org/)

Provided by Allen Institute for Brain Science

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