Abstractions

NEWS & VIEWS AUTHOR

For every immune challenge there is an opposing immune response. But researchers are using immune reactions to one challenge to treat a completely separate challenge. In the paper on page 682, scientists look at how one particular response — a ligand–receptor pair that most probably evolved to prevent tissue damage following an immune response — could be manipulated to clear a different chronic infection. In a related News and Views (page 669), Michael Bevan, an immunologist at the University of Washington in Seattle, looks into the implications of the balancing act between immune challenge and response. *Nature* talked to Bevan about his take on the paper's broader implications for immunology and clinical practice.

In your News and Views, you talk about a "delicate balance". What is this balance and what challenges and opportunities does it present?

The immune system is good. It protects us from lots of things. But it also does a lot of harm, when it gets too widespread with so many T cells going after things and killing them and releasing lots of cytokines. The response can be worse than the virus itself. In mice that don't have a functional immune system, you can infect them with this virus and they'll just retain the virus for life. But if you inject them with T cells and give them an immune system, they would die as a result of the inflammatory response.

So what does this tell us about treating humans?

That remains to be seen. It's hopeful for certain cases of chronic infections. But this is just a mouse model.

Is the reactivation of T cells a short- or long-term strategy in treating chronic viral infections?

We're afraid to call this a long-term strategy because of the threat of autoimmune reactions; things that would ordinarily be held in check for a short period could become full blown. The paper didn't show that, but that's the worry.

What's the next step?

In the paper that was published, the virus wasn't actually cleared. But it showed that the experiment can be carried out repeatedly. It would be interesting to do this with a virus that is actually cleared.

How does this resonate or mesh with your own work?

My lab doesn't work on chronic infections; we work mostly on acute affections, and with the same virus in the same mice. ■

MAKING THE PAPER

James Hinton

A large international effort reveals secrets hidden in the Milky Way.

When James Hinton was working at the Enrico Fermi Institute in Chicago, he heard about plans to build a telescope system that would measure high-energy cosmic rays. So he packed his bags and joined the Max Planck Institute for Nuclear Physics in Heidelberg to be part of an international collaboration involving 100 astrophysicists from eight different countries. "It turned out to be a good move," says the Leeds University graduate and lead author of a study published on page 695 of this issue of *Nature*.

The paper, the latest in a series from the High Energy Stereoscopic System (HESS) team, describes evidence of a burst of acceleration of cosmic rays that occurred 10,000 years ago in the Milky Way. Such Galactic rays are thought to originate in the shock waves from supernova explosions. The team gathered the data with an array of four Cherenkov telescopes at Windhoek, Namibia, which was built with money and manpower from Germany, France, Namibia, Britain, Ireland, the Czech Republic, Armenia and South Africa. The area in Namibia is well known for its excellent conditions for optical astronomy.

Now, the same scientists involved in the design and construction of the telescope system are reaping the fruits of their labours. But doing so requires much coordination and communication among disparate research groups. Every year, members of HESS put together proposals for different observation targets, reviewed by one of seven physics groups of different areas of expertise. Then the groups make recommendations to an observation committee to decide how many hours of data collection to devote to each approved research project.

Data are gathered in Namibia by a monthly shift crew of two or three people, assisted by a local team. The data are simultaneously sent to Lyon and Heidelberg, from where they are distributed to scientists at participating universities and institutes. "When the data come in we grab hold of them and perform some quick analyses. Some people are more interested in a specific angle," says Hinton. "You then discuss with the group what you want to write up." For any particular study, two separate groups conduct parallel analyses and check the other's work, allowing all members input on this paper, explains Hinton. "The process can be complicated when writing a paper because everyone has strong opinions about what the data mean," he adds.

Although a number of telescopes can measure high-energy cosmic rays, none comes close to the level of precision of HESS. This means that scientists can home in on the exact location of the rays in an attempt to deduce their source. One of the first targets of analysis by the HESS team has been the centre of the Milky Way, which harbours a number of potential gamma-ray sources, including a supermassive black hole, remnants of supernova explosions and dark-matter particles.

Discussions for the next-generation telescope system kicked off in 1995, but construction did not begin until 2001 and was completed in 2004. The project is now heading into a second phase in which an even larger (28 metres in diameter) telescope will be added to the research set-up. ■

QUANTIFIED **INDIA**

A numerical perspective on *Nature* authors.

At the International Centre for Genetic Engineering and Biotechnology (ICGEB) in New Delhi, India, Amit Sharma runs a small research group focused on structural analyses of malaria parasite proteins. Collaborating with the European Molecular Biology Laboratory in Grenoble, France, the team has now presented the structure of one of the parasite proteins that recognizes human blood cells and facilitates parasite invasion into host cells (see page 741).

Malaria is a pressing problem in India and throughout the developing world — Sharma says being able to do research that is of direct relevance to the country he lives in is one of the benefits of working at the ICGEB. The focus on malaria, he says, is to understand the basic biology of the parasite for its potential and eventual use in controlling the disease.

68 countries are signatories to the ICGEB.

103 manuscripts have been submitted to *Nature* from India in the past six months (1.9% of total submissions).

1,183 is the number of downloads the paper by Sharma *et al.* received from the *Nature* website in the first week after advance online publication.

6 papers with contributing authors working in India have been published in *Nature* in the past year.