

NEWSMAKER INTERVIEW: LUC MONTAGNIER

## French Nobelist Escapes 'Intellectual Terror' to Pursue Radical Ideas in China

**PARIS**—Virologist and Nobel laureate Luc Montagnier announced earlier this month that, at age 78, he will take on the leadership of a new research institute at Jiaotong University in Shanghai. What has shocked many scientists, however, isn't Montagnier's departure from France but what he plans to study in China: electromagnetic waves that Montagnier says emanate from the highly diluted DNA of various pathogens.

Montagnier, who won a 2008 Nobel Prize for his discovery of HIV, claims that those signals—which he described in two little-noticed papers in 2009—can reveal the bacterial or viral origins of many conditions, including autism and Alzheimer's disease. The work could suggest novel therapies, he says.

But Montagnier's new direction evokes one of the most notorious affairs in French science: the "water memory" study by immunologist Jacques Benveniste. Benveniste, who died in 2004, claimed in a 1988 *Nature* paper that IgE antibodies have an effect on a certain cell type even after being diluted by a factor of  $10^{120}$ . His claim was interpreted by many as evidence for homeopathy, which uses extreme dilutions that most scientists say can't possibly have a biological effect. After a weeklong investigation at Benveniste's lab, *Nature* called the paper a "delusion."

*Science* talked to Montagnier, who is founder and president of the World Foundation for AIDS Research and Prevention, last week. Questions and answers have been edited for brevity and clarity.

—MARTIN ENSERINK

### Q: Why are you going to Shanghai?

**L.M.:** I have been offered a professorship and a new institute, which will bear my name, to work on a new scientific movement at the crossroads of physics, biology, and medicine. The main topic will be this phenomenon of electromagnetic waves produced by DNA in water. We will study both the theoretical basis and the possible applications in medicine.

### Q: What exactly are these waves?

**L.M.:** What we have found is that DNA pro-

duces structural changes in water, which persist at very high dilutions, and which lead to resonant electromagnetic signals that we can measure. Not all DNA produces signals that we can detect with our device. The high-intensity signals come from bacterial and viral DNA.

### Q: What do you think are the potential medical applications?

**L.M.:** I have found these signals coming from bacterial DNA in the plasma of many patients with autism, and also in most, if not all, patients with Alzheimer, Parkinson's disease, and multiple sclerosis. It seems that the



bacteria we are detecting are coming from the gut. So it is quite possible that products from gut bacteria end up in the plasma and cause damage to the brain.

The waves give us a biomarker to test for the presence of these bacteria, even when we can't detect them with classical techniques like PCR. So when we treat these diseases with antibiotics, our hope is to see the pathogen disappearing. One idea is to set up a clinical trial in autism here in France. We will first show that we can detect bacterial DNA in the plasma of autistic children and not in a healthy control group. Then, if we get agreement from an ethical committee, autistic children can be treated with antibiotics to see whether the DNA signal disappears and their clinical condition improves. In the future, we may use these findings not just for diagnostics but also for treatment. It's possible that electromagnetic waves at some frequency will kill the waves produced by bacterial DNA.

### Q: Many of your colleagues seem to be extremely skeptical.

**L.M.:** Well, I was skeptical myself in the beginning. But these are facts. The findings are very reproducible and we are waiting for confirmation by other labs.

### Q: You have called Benveniste a modern Galileo. Why?

**L.M.:** Benveniste was rejected by everybody, because he was too far ahead. He lost everything, his lab, his money. ... I think he was mostly right, but the problem was that his results weren't 100% reproducible.

### Q: Do you think there's something to homeopathy as well?

**L.M.:** I can't say that homeopathy is right in everything. What I can say now is that the high dilutions are right. High dilutions of something are not nothing. They are water structures which mimic the original molecules. We find that with DNA, we cannot work at the extremely high dilutions used in homeopathy; we cannot go further than a  $10^{-18}$  dilution, or we lose the signal. But even at  $10^{-18}$ , you can calculate that there is not a single molecule of DNA left. And yet we detect a signal.

### Q: Can't you pursue this research in France?

**L.M.:** I don't have much funding here. Because of French retirement laws, I'm no longer allowed to work at a public institute. I have applied for funding from other sources, but I have been turned down. There is a kind of fear around this topic in Europe. I am told that some people have reproduced Benveniste's results, but they are afraid to publish it because of the intellectual terror from people who don't understand it.

### Q: Are the Chinese more open to it?

**L.M.:** I think so. I have visited Jiaotong University several times, and they are quite open-minded. The editor-in-chief of [*Interdisciplinary Sciences: Computational Life Sciences*], the journal in which I have published two papers on this topic, is based there as well.

### Q: Aren't you worried that your colleagues will think you have drifted into pseudoscience?

**L.M.:** No, because it's not pseudoscience. It's not quackery. These are real phenomena which deserve further study.