

## Deadly diseases and inflatable suits: how I found my niche in virology research

**Virologist Hulda R. Jónsdóttir studies some of the world's most pathogenic viruses at the Spiez Laboratory in Spiez, Switzerland. For her, highly pathogenic viruses are more often a source of curiosity than of concern. Jónsdóttir, who runs a research project at the Spiez Laboratory, regularly dons a giant, inflatable protective suit to research disinfectants and antiviral compounds to combat several lethal viruses, including Ebola virus and Lassa virus. Jónsdóttir spoke to *Nature* about carving her own path in virology research and why she chose to pursue a career in Switzerland and at the Spiez Laboratory, which is owned and funded by the Swiss government.**

### Why do you study lethal viruses?

I've always been fascinated by viruses. They comprise barely anything, yet they have such a big impact on living organisms. Most of the viruses my lab and I study are highly pathogenic and lethal, such as Ebola virus, Lassa virus, Nairovirus and Nipah virus. Because these are all so lethal and don't have vaccines or cures, they're considered biosafety level (BSL) four. I have to wear a big inflated suit that's attached to an air supply outside the room when I conduct my experiments.

### What are you working on now?

My colleagues and I just started a three-year project to develop a model for testing antivirals against henipaviruses, which can cause respiratory illnesses and encephalitis. I also do disinfection studies for highly pathogenic viruses. Right now, we are looking at how effective homemade soap is as a disinfectant for Lassa virus, which is endemic in Nigeria as well as some other countries in West Africa.

### What led you to your position at the Spiez Laboratory?

After I finished my PhD in virology at the Swiss Federal Institute of Technology (ETH) in Zurich in 2016, I stayed in the lab for a year as a postdoctoral researcher. By that point, I wasn't sure whether I wanted to stay in science. Then I saw an advertisement for a two-year postdoctoral placement in respiratory toxicology at the University



Hulda Jónsdóttir wears inflatable protective suits like these to study lethal viruses.

of Bern. I thought that the experience would help me determine whether I was tired of science as a whole or just feeling disillusioned with my current environment because I had been there for so long. There, I realized that I still liked doing science and that I missed virology research.

Two years later, I saw a postdoctoral job at the Spiez Laboratory to study an experimental Ebola vaccine. The project required BSL-4 work, which was something I had dreamt of doing since I started working in respiratory virology. I decided to apply for the position. It's been five years, and I'm still here.

### How does the Spiez Laboratory differ from academic labs?

We're a government institution, and part of the Swiss Federal Office of Civil Protection. In the biology department, we have governmental mandates to do research that is relevant to Swiss civil protection, although of course we can focus on other topics as well. I do a lot of applied research that benefits the public, such as trying to find antiviral drugs against infectious diseases. We also collaborate with the military by training soldiers for biological civil protection twice a year. During the COVID-19 pandemic, soldiers helped personnel from the Spiez Lab to run diagnostic tests for COVID-19.

Along with research, we run a regular diagnostic service for hospitals and doctors

who send samples to us to be tested. Unlike an academic lab, you need security clearance to work here.

### How did the COVID-19 pandemic affect your research?

I started working on coronaviruses during my PhD, so I had a lot of experience with them by the time the pandemic hit. I was doing my BSL-4 training at the Spiez Laboratory when I first heard about COVID-19. At the time, I felt frustrated because I was progressing in my career and then got pulled back into coronavirus research. But I had to figure out how to research SARS-CoV-2 or my lab would have been shut down. By the middle of 2020, I was constantly being contacted by researchers to do antiviral drug tests, and by the military to do serological tests of soldiers. My colleagues and I analysed soldiers' responses to the virus and estimated the percentage of asymptomatic people. Doing COVID-19 research was very chaotic for a while; everybody wanted results immediately. But in a way, I was grateful that I could still go to work, even if it was crazy busy. As a foreigner, I was far away from my family, so it was difficult being so isolated.

**Interview by Nikki Forrester.** This interview has been edited for length and clarity.

**Correction**

This Spotlight article misstated the group of viruses that cause encephalitis and overstated Hulda R. Jónsdóttir's role at the Spiez Laboratory.