



Where I work Armando Pacheco

Photographed for *Nature* by
Jesse Winter.

Let's say you wanted to sort people according to the colours they have dyed their hair. You could line them all up, single file, and send those with blue hair to one spot, undyed hair to another, and so on.

That's what we do with cells in a process called flow cytometry. You stain the cells, and the machine detects the colour as they pass by. It's a way to study single cells. With the right kind of stain, we could, for example, ask how many cells in a sample are infected with SARS-CoV-2, the virus that causes COVID-19, and how many are not. We can also sort all the healthy cells into one test tube and all the infected cells into another.

As manager of the Flow Cytometry Facility at Cornell University in Ithaca, New York, I clean and calibrate the machines – here I'm working on the purple-fronted machine under the hood. To test it, I use a suspension of beads, the greenish liquid in the cylinder. Things such as humidity and air pressure can affect these sensitive machines, so it's always a challenge. I like challenges.

Our facility was closed in March and April

because of the pandemic, but then we got the green light to open for people working on the virus. One laboratory is working on a vaccine that it tested in animals, and we helped the team to sort and count the animals' immune cells. I go in to prepare the machine and meet the person bringing the samples, but I can also monitor things from home.

I grew up in Guanajuato, Mexico, before moving in 1991 to California, where I met my husband and trained as a science teacher. Now, I teach scientists about flow cytometry and help them to plan their experiments. Every experiment is different: they might be sorting bacteria, pollen grains, chloroplasts, spores, you name it. One person wanted to sort coffee grounds; another lab brought in dish-grown feathers for analysis.

It's inspiring.

Armando Pacheco is the operator for fluorescence-activated cell sorting at the Cornell University Institute of Biotechnology's Flow Cytometry Facility in Ithaca, New York.

Interview by Amber Dance.