Where I work

María Fernanda Cerdá

I build solar cells using natural dyes that I find in fruit and flowers. Plant pigments called anthocyanins absorb light and turn it into energy to fuel photosynthesis, and I harness that power to generate electricity. The technology to convert plant dyes into electricity was developed in Switzerland, but I'm applying it to plants that are indigenous to my home country, Uruguay, including its national flower, the ceibo (*Erythrina crista-galli*).

In this picture, I'm purifying a ceibo extract. Once I remove the bright-red dyes, I measure their efficiency in converting sunlight to energy. For that, I use a solar simulator, which mimics the Sun's rays. Here, the simulator is the grey box with a little black box on the side. The wooden stand, which my husband made by hand, enables me to raise the instrument to control the amount of radiation reaching my sample.

I've worked at the University of the Republic in Montevideo for 30 years, first on synthesizing radioactive materials for use in medicine, then as an electrochemist. Some say that natural dyes aren't stable enough to use in solar cells, but I built a prototype panel in 2019 that I tested for two years at Uruguay's Artigas Base in Antarctica. It never stopped working, not even in winter when there is very little light.

Photovoltaic devices produce less than 1% of the energy of my country. But I hope that my work will prepare us for the future.

My country is very small and has very few scientists, and nobody else does what I do. My field, photoelectric engineering, is populated mainly by men. I'm a woman and a chemist. As a result, I've felt stuck in my career. But my three daughters are growing up differently: they are going to reach further.

Funding is scarce, and without it I cannot pay salaries. That's why I still work in the laboratory at the age of 54. But I don't complain: I love lab work. That's my corner, in the picture, and everyone in my group knows that and respects it.

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Interview by Linda Nordling.

Photographed for *Nature* by Pablo Albarenga.