

CELL DEATH & CERTAINTY

DIYA MUKHERJEE
Rockefeller University

Abstract

I am Diya Mukherjee, a high school senior based in San Jose, CA with an interest in computational biology and public health. The summer of 2023 marked a turning point for me that is familiar to any science student: my first wet lab experience. I was given the incredible opportunity to participate in the Summer Science Research Program (SSRP) at Rockefeller University in New York, NY, and work with research mentors from the Fuchs Lab of Mammalian Cell Biology and Development on a project about the role of inflammation in skin cancer. Cell Death & Certainty depicts an incident from my third week of the program, in which many of my cell samples began to mysteriously die overnight. I deliberately wrote the story with a melodramatic tone because I think that science so often feels that way.

They were all dead.

Time of death: Sometime in the last 24 hours.

Cause of death: Unknown.

I squinted with one eye through the microscope and observed the graveyard of cells in the cell plate, each adopting an inky blue color, announcing their journey to the underworld. Although the cells had most likely died because of an equipment malfunction, I still felt a level of personal responsibility. I had failed the tiny units of life that had depended on me as their caretaker.

The dying cells were one of the many setbacks in my scientific project during my time interning with the Summer Science Research Program (SSRP) at Rockefeller University in New York, New York. As my first in-person research experience, this internship was everything to me: I knew I had no choice but to “do the science correctly,” to eliminate any possible source of error and to account for every single variable. My pipetting, a method of transferring cells, had to be immaculate, and my procedure had to be airtight. I refused to be the person with scattered, inconclusive results. Precision, I determined, was the key and point of validation to my work.

Walking back home that day, I watched New York’s cloudy Manhattan sunset, and I was determined that today’s failure would never be repeated. My trial run at perfection had ended today; the next morning would be the real thing. The next morning is when I will be *that* scientist.

I was greeted the next morning at Rockefeller University by a cluttered cell culture laboratory and a song by Canadian rapper, Drake, playing on the radio channeled through a Bluetooth speaker. My peers had already begun processing their cell samples, and they welcomed me with hopeful smiles and pats on the back. Still, a lull in the chatter told me they were suffering from similar doubts about the cell samples. Would our new cells live, survive? Or would they suffer the same fate as their predecessors?

I walked towards the bench and cell incubator, pulled out my cell culture plates. I was nervous but I carefully placed them under the microscope. A swarm of blue coloured the magnification field. The blue colour answered my question. My face fell as I shifted the scope to focus on different parts of the cell plate. Blue, I found. Blue. Blue. Blue. With each shift, I observed the mass death. I was convinced: any hope of scientific discovery was lost.

My research mentor passed by my laboratory space.

“Need any help?” she asked, and I knew what she was really asking me.

“They’re all blue,” I told her with an upsetting tone in my voice, “I can’t see any living cells in the microscope.”

I shifted over to let her look down at the lens to confirm my results. She paused for a minute, looked at me with a thinking look.

“Have you written it down in your notebook?” she asked.

“No,” I replied promptly, “There’s nothing living to note down.”

She laughed. “You’re too used to classroom science, Diya. Write down the possible sources of cell death in your notebook. You can even count the number of dead cells too to see what you can learn.”

I was taken aback. New possibilities popped into my head: What if the cell incubator had failed? Or perhaps, the cell “food” accidentally had a harmful chemical in it? Or, maybe, I hadn’t cultured the cells properly to begin with.

I stared at my notebook, hesitant to write my ideas down. It felt like I was accepting failure. At the same time, acknowledging the error felt liberating, like a step forward after hitting a wall.

I sighed.

“This is frustrating.”

My mentor shrugged her shoulders casually. “Welcome to research,” she said.