Beata Edyta Mierzwa was born in a small rural village in Poland into a family of farmers and metal workers, but spent most of her childhood living in Austria with her mother, an artist. As an inquisitive undergraduate, she discovered research as an outlet for her curiosity, working in multiple laboratories on diverse projects. In her PhD program, she became hooked on studying cell division with microscopy, a passion she has carried over to her postdoctoral research at the Ludwig Institute for Cancer Research and the University of California, San Diego. Mierzwa uses these cross-disciplinary experiences in science to elegantly combine ideas of seemingly disparate fields. In parallel to her work in the laboratory, Mierzwa creates scientific artwork to illustrate complex biological concepts in beautiful and accessible ways. From journal covers to her own line of whimsical science-themed clothing, Mierzwa interprets scientific messages using mesmerizing designs with vibrant colors and dreamlike patterns.

We reached out to Mierzwa to learn more about how her artistic pursuits shape her science.

**When did your interest in science begin?**

Despite being raised in an environment that valued a simple life, my natural curiosity growing up had me asking such an overwhelming number of questions that I still hear anecdotes about it today. Though I wasn't exposed to science as a child, my curiosity about the wonders of life drew me to a career in science, and I started studying molecular biology before I even knew what the inside of a laboratory looked like.

**Where and with whom have you studied?**

I completed my studies at the University of Vienna in Austria. My favorite aspect of the program was the freedom to join as many laboratories as I wanted for extra internships, so I made a conscious effort to become familiar with very diverse research fields. I investigated stress responses in budding yeast using quantitative mass spectrometry, contributed to the discovery of a transfer RNA ligation pathway with biochemical assays (1), and used crystallography to investigate the structure of an arginine phosphatase (2). I completed my master's thesis at ETH Zürich in Daniel Gerlich's laboratory, where I used high-throughput microscopy to study how microRNAs regulate mitosis (3). It was during this time that I discovered my passion for cell division and microscopy. Daniel's laboratory was an incredibly supportive environment, and I decided to move with the laboratory to the Institute of Molecular Biotechnology (IMBA) at the Vienna BioCenter to start a new research project for my PhD.

For my postdoctoral research, I recently joined the laboratories of Karen Oegema and Arshad Desai at the Ludwig Institute for Cancer Research and the University of California, San Diego. I'm thrilled to be part of their big scientific family that has made outstanding contributions to the fields of cell division and development.

**What interested you about your current area of study?**

I am passionate about cell division, a fascinating process that is as complex as it is beautiful. When I started my PhD, I was particularly excited by a recent discovery about the final step in cell division—that spiral filaments constrict the membrane that connects the cells until they separate (4). I was intrigued that such a prominent structure, involved in a process that had been studied for centuries, could remain undiscovered for so long. The opportunity to uncover such mysteries is the reason I initially chose to focus on cytokinetic abscission (5).

During my PhD I studied the dynamics of the endosomal sorting complex required for transport (ESCRT) III, which constricts the membrane during abscission and is a highly versatile membrane fission machinery involved in many other fundamental cellular processes. At that time, prevailing models assumed that ESCRT-III forms persistent filaments that change their curvature to constrict membranes, but the possibility that these polymers might be dynamic structures had never been considered. To my surprise, photobleaching experiments showed that ESCRT-III polymers rapidly exchange their subunits. I further uncovered an unexpected role for the ATPase VPS4, which was previously thought to primarily disassemble ESCRT-III. On the contrary, I found that VPS4 stimulates ESCRT-III polymer growth by releasing inhibitory subunits through subunit turnover. This dynamic reorganization places ESCRT-III into the same category of cytokinetic abscission.
Beata Mierzwa: Bridging the divide between science and art

Infarinato

feedback I received encouraged me to start making science art, but the positive
and it tended to stay in people's memories.
I never really made a conscious decision to
of my scientific presentations was an excel-
realized that showing this drawing as part
in the final step in cell division. I quickly
by microtubules or actin networks, with broad implications for many cellular pro-
cells using scissors to cut their connection
therapy, and it might open exciting cell bio-
requirements vary between cell types with
different cell types and tissue context. While
I am currently investigating whether and
broad implications for many cellular pro-
like microtubules or actin networks, with
other force-generating filament systems
as well, and I started spending my

Spending a lot of time behind the micro-

What are you currently working on?
I am currently investigating whether and
how the cell division machinery adapts to
different cell types and tissue context. While
the majority of cell division research has fo-
cused on conserved and universal mecha-
nisms, the diversity of mitotic mechanisms
remains largely unexplored. Mechanistic
requirements vary between cell types with
different morphologies and lineages, and
they likely require specialized mitotic ma-

Structured illumination microscopy of HeLa cell mid-
obodies at early and late abscission stages, stained
with antibodies against α-tubulin (blue) and ESC
RT-II subunits CHMP4B (green) and CHMP2B (red).
Bar, 1 µM. Image courtesy of Beata Edyta Mierzwa.

as other force-generating filament systems
that require dynamic turnover for function,

What is your science art? How do you create your illustrations?
I create illustrations for other people's re-

Does your passion for creating artwork influence your approach to science?
My science art allows me to practice a skill
I consider extremely important in science:
breaking down the essence of complex sci-
entific findings to focus on the most im-
portant aspects. This is essential for trans-
slating abstract concepts into intuitive visuals
for my illustrations and greatly impacts the
way I present my own research. In addition,
through illustrating other people's research
I learn about scientific fields outside of my
own. Often, my only guidance for an illus-

Creating science art is a rewarding process that can

How and when did you realize that you could marry your love of science and art?
I made my first science art drawing to de-
pict the theme of my PhD research, two
cells using scissors to cut their connection
in the final step in cell division. I quickly
realized that showing this drawing as part
of my scientific presentations was an ex-

What are the potential benefits of scientific art?
Art and science are both powerful tools for commu-
nicating complex ideas. Scientific art, in par-
specialists. By creating science art, I have been able to

How can other scientists benefit from science art?
Science art has the potential to spark fascination
and curiosity in a way that traditional scientific
writing often cannot. It provides a visual represen-
tation of scientific findings that can be more
engaging and memorable than text alone.

What advice would you give to scientists who have diverse interests?
Don't be afraid to pursue your passions! Science is
not a closed community, and there is no rule that
states you must choose between science and art.
By embracing both, you can find new ways to
communicate and engage with your audience.

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