IMP
Research Institute of
Molecular Pathology

IMBA

2025
FACILITIES & COMMUNITY

Part of
Vienna
BioCenter

About the kaleidoscope visuals

The kaleidoscope images turn scientific data into a visual language that invites curiosity at the point where objective data meets human perception.

A kaleidoscope creates rhythm from one fragment, drawn from research group diagrams, fluorescence microscopy, and model organisms, which is mirrored time and again to produce predictable cycles of symmetry, like petals around a center, triangular wedges, or rotating star patterns.

You will see this repetition of geometric shapes and colors throughout the report.

Download all kaleidoscope designs as mobile and desktop wallpapers.

imba.ac.at/downloads
imp.ac.at/downloads

IMBA

IMP

THE FABRIC OF DISCOVERY

A JOINT REPORT BY THE IMP AND IMBA

Content

1. The bigger picture

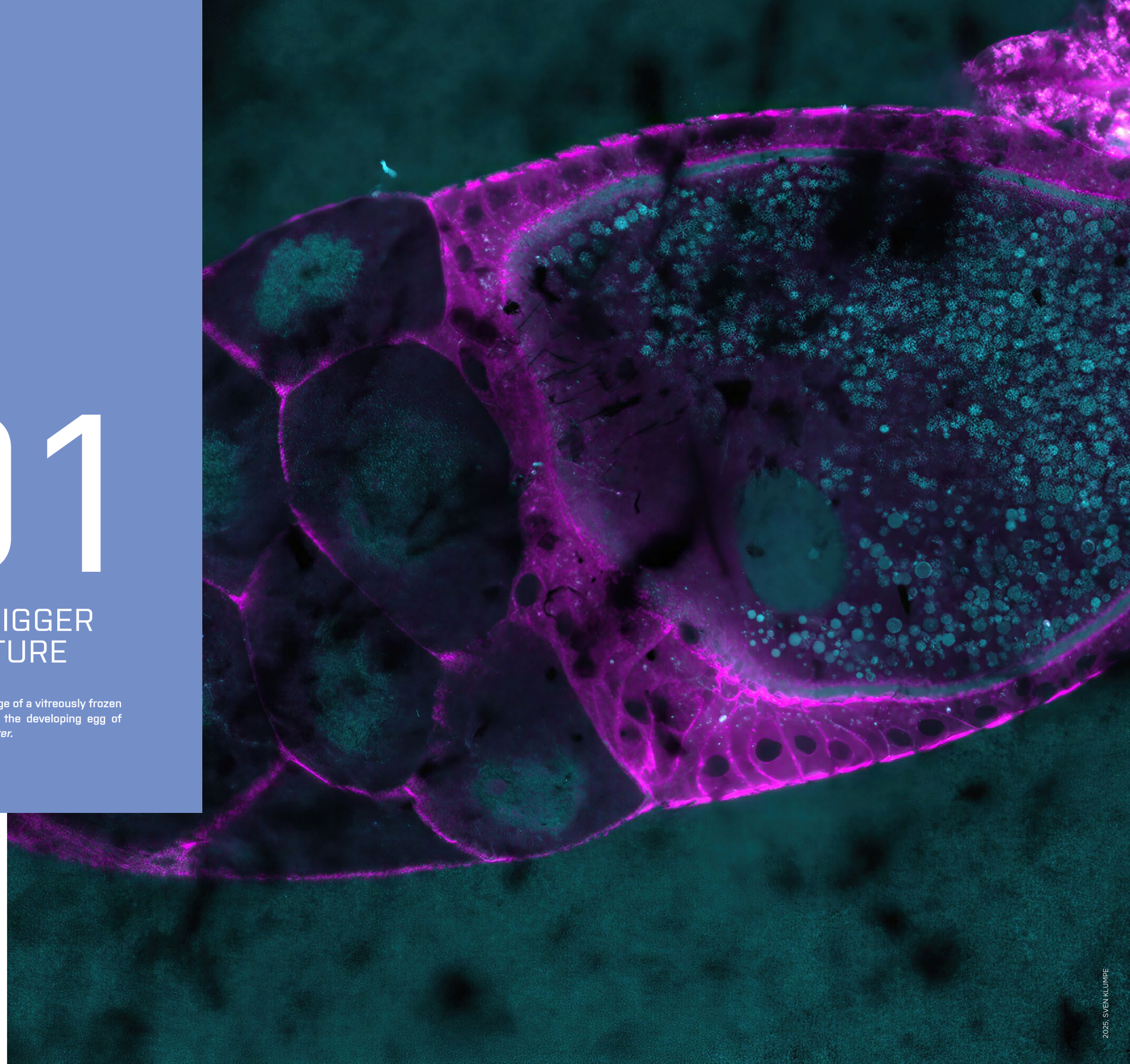
2. Inside research at the IMP and IMBA

3. Learning, leading, connecting

01

THE BIGGER PICTURE

Cryo-fluorescence image of a vitreously frozen fruit fly egg chamber, the developing egg of *Drosophila melanogaster.*



2025, SVEN KLUMPE

Science's hidden strength

On resilience, community, and what forms in the spaces between the work: a preface to the IMBA and IMP 2025 joint research report.

What makes the bridge special is both literal and symbolic: It connects the IMP and IMBA in daily life, while pointing to the informal ties between people, places, and ideas that help science take shape across the Vienna BioCenter.

This joint report from IMBA and the IMP covers the science, the people, and the events of 2025 across both institutes. The stories document questions asked, experiments run, and findings made. But in the conversations that produced the stories, something else surfaced alongside the science, something less visible in the finished work but present in almost every exchange. It was not quite on topic for any single story, and so it kept getting set aside. But together, those conversations told a story of what research asks of the people pursuing it, and what they find in the community and in each other, to meet that demand.

The baseline

The conditions of a research career are, by any measure, demanding. *PLOS Biology*, one of the few journals to share data on rejection rates, turns away 90 percent of submitted papers. The European Research Council's life sciences Starting Grants rejected 88 percent of applications in 2025, from researchers with strong track records and years of evidence behind their proposals. Rejection is not a phase that researchers pass through on the way to more stable ground. It is a permanent feature of the work at every level.

The pressures that come from outside are matched by those researchers' place on themselves. "My experience is that students and postdocs want to answer things at a very high level and in a rigorous way, and they want to keep doing more and more," says Elly Tanaka, Scientific Director at IMBA. [You can read more about her perspective in "The space between intuition and proof" in the IMBA report.]

What changes, for researchers who stay in the field long enough, is not the frequency of setbacks but their relationship to them.

A different way of reading

Early in a research career, a result that contradicts a hypothesis feels like a defeat. With experience, the same result becomes something else: data, a constraint, a more precise map of where the answer is not. That shift is everything.

Research in learning science offers a framework for understanding why this shift matters. A 2016 study by educational psychologist Manu Kapur found that students who were allowed to struggle with a problem before being shown its solution went on to solve subsequent complex problems with significantly greater accuracy than those taught the correct approach from the start, an improvement of 35 to 40 percent. The implication is not that failure is good in itself, but that grappling with a problem, rather than skirting around it or being told what to do, builds long-lasting, transferrable capabilities.

Researchers who have made that shift describe it as a change in how they read their own results. "At the beginning, you feel like you have to learn not to care about a bad result," says Júlia Portell i de Montserrat, a PhD student in the Brennecke and Plaschka labs at IMBA and the IMP. What she describes is not indifference. "Really, you have to learn to appreciate experiments with bad results, even if they are not consistent with your hypothesis, especially if they are not consistent with your hypothesis, because they tell you something. They give you definitive results, and they make you wonder whether your hypothesis is correct." It is, she adds, a process that takes time. [Portell's own research is explored in "Small steps, big questions" in the IMBA report.]

The evidence from research careers supports the value of that shift. A 2019 study by Wang et al., updated and replicated in 2025, compared researchers whose grant proposals narrowly missed the funding threshold with those who had narrowly succeeded. Over the following decade, the near-miss researchers who reapplied went on to produce work with 6.1 percent higher citation impact. The authors note that selection plays a role: those who reapply are not a random group. But the capacity to reapply, to treat rejection as the beginning of the next attempt rather than the end of the current one, is itself what is being measured.

At every career stage, the underlying logic is the same, even if the specific challenge differs. Anna Obenauf, Senior Group Leader at the IMP, has found that the scale of a research question can itself become an obstacle. "Often people find it incapacitating to see this end goal," she says. "If you break down goals into smaller steps, it helps with the entire process and takes away a little bit of the pressure." [Obenauf's own goals are explored further in "Close enough to collide" in the IMP report.]

The people around you

None of this happens alone. It develops in the presence of other people, through relationships that absorb some of the difficulty and reflect it back differently. Research on mentorship suggests that the relationships surrounding a researcher are among the most consequential factors in their long-term development. A 2020 study by Ma et al. tracked nearly 40,000 scientists over 50 years and suggested that those who succeeded in working with high-impact mentors were two to four times more likely to reach the highest levels of recognition in their fields. The finding that stands out, however, is not about replication but about independence: the researchers who benefited most from strong mentorship were those who used it as a foundation to develop their own original scientific direction rather than extending their mentor's.

For early-career researchers, the practical implication is clear. "Finding a good supervisor who can help you grow as a scientist, who can push your project and your career wherever it goes, that's what's really important," says Ida Jentoft, postdoctoral researcher in the Pauli lab at the IMP. [Her experience of finding that relationship can be found in "The PhD student next door" in the IMP report.]

The mentor relationship anchors that support, but it is not its only source. The informal connections between peers, formed in the spaces between the formal work, matter in ways that are harder to quantify and easier to overlook. Kristina Stapornwongkul, Group Leader at IMBA, describes what a brief conversation after a difficult day can do. "Sometimes you just feel better if you have a coffee with a colleague and say 'oh, that was really horrible today.' Afterwards, it already feels less horrible. It gets it out so it doesn't build up inside. This community feeling can be quite powerful." [Her first year as a Group Leader, including how she built that culture deliberately, can be found in "Unpacking the lab—and the questions" in the IMBA report.]

What accumulates

The resilience that develops across those relationships and those years is, in many cases, invisible to the people who have developed it. "If you do a PhD in an environment like this, you can definitely call yourself a resilient person," says Emmanouella Chatzidaki Trinks, Head of Scientific Affairs at IMBA. "But ask them to name their greatest strength, and resilience won't even make the list. That's what's so fascinating." [What that pressure looks like from the inside is the subject of her own story, "Behind the scenes of funding acquisition," in the IMBA report.]

The stories in this joint report document the science. But they also document, for those who want to dig deeper, everything that made it possible.

PLOS Biology editorial metrics. PLOS. https://plos.org/metrics/

European Research Council. (2025). ERC Starting Grants 2025: applications, facts and figures. https://erc.europa.eu/system/files/2025-09/erc-2025-stg-statistics.pdf

Kapur, M. (2016). Examining productive failure, productive success, unproductive failure, and unproductive success in learning. *Educational Psychologist, 51*(2), 289–299. https://doi.org/10.1080/00461520.2016.1155457

Wang, Y., Jones, B. F., & Wang, D. (2019). Early-career setback and future career impact. *Nature Communications, 10*, Article 4331. https://doi.org/10.1038/s41467-019-12189-3

Yin, Y., Dong, Y., Wang, K., Wang, D., & Jones, B. F. (2025). Replication of early-career setback and future career impact. *eLife, 14*, Article e109042. https://doi.org/10.7554/eLife.109042

Ma, Y., Mukherjee S., & Uzzi, B. (2020). Mentorship and protégé success in STEM fields. *Proceedings of the National Academy of Sciences, 117*(25), 14077–14083. https://doi.org/10.1073/pnas.1915516117

The Vienna BioCenter

Some stories are about what is discovered. These stories relate how discovery happens in the first place: through infrastructure, community, resilience, and the many people whose work makes research possible but rarely visible. The third volume of the research reports is not about the IMP or IMBA—it is about all the things that bridge the two, including the Vienna BioCenter campus and more.

In this third volume, you will encounter science in unexpected places—from the stage to the server room. A portrait of the Vienna BioCenter Amateur Dramatic Club reveals how creativity beyond the bench strengthens the community and inspires, while the launch of AITHYRA was a bold step toward integrating artificial intelligence further into biological discovery on campus.

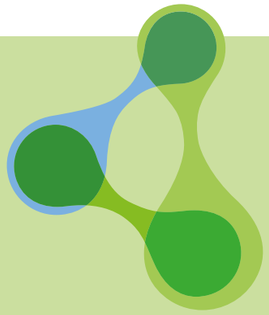
This volume also celebrates the human architecture of research: close collaborations in a spirit of trust, the often-invisible ingenuity of core facilities, and training programs that prepare scientists not only to experiment, but to lead. Stories about postdoctoral mentorship, leadership development, and thoughtfully designed conferences explore how culture shapes scientific excellence as much as technology does. Stories about recognition—from PhD students redefining their career horizons to the annual self-organized symposium to the Rabitsch Award for pioneering work in cerebral organoids.

Together, these stories show that breakthrough science depends not only on bright ideas, but also on strong communities across conventional boundaries, as well as shared values and the courage to try new formats—in research, training, and beyond.

Step into the Vienna BioCenter: a shared campus of research, training, and collaboration that shapes how we work every day.

The Vienna BioCenter at a glance

The Vienna BioCenter is two things: first, a location in the south of Vienna's third district; second, an association with over 50 members working in life science research, training, and business. For the IMP and IMBA, the Vienna BioCenter is also a framework and focal point for a sense of identity alongside exceptional life science research.



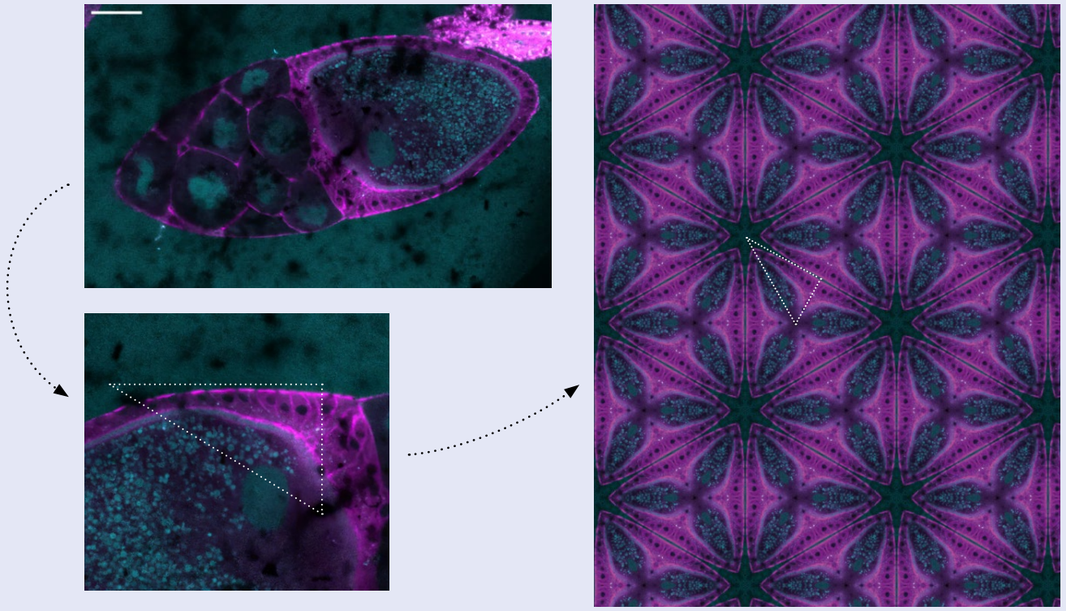
The Vienna BioCenter logo is a visual symbol of connection, overlap, and shared identity across the campus.

2800 Staff	2000 Scientists

600 PhD Students	80 Nationalities	147 Research Groups	10 Scientific Facilities

How we made this

Representing dozens of research groups across IMBA and the IMP in a single publication is a challenge for editors, photographers, and designers with no obvious solution. Here's how the team behind this report found one.



A research institute isn't a monolith. Across IMBA and the IMP, there are more than 30 research groups, hundreds of people, and scientific questions that range from molecular structure to human disease. Representing all of that visually, in a way that feels like it belongs to everyone, is a genuine design challenge. Feature one group on the cover and others ask why. Use photographs and the question of who is included, and how prominently, becomes unavoidable.

For the past three years, a ten-person team at The Gentlemen Creatives, a Vienna-based design studio whose international clients include IKEA, Boehringer Ingelheim, and Nikon, has designed and produced the IMBA research report. This year, the scope grew to include the IMP research report and the joint report in your hands. The team is led by Creative Director Mark Hinckley and Richard Ördög, whose role as Online Architect spans digital strategy, web platforms, and the technical infrastructure behind the studio's work. Together, they found their answer to designing for an entire community in the science itself.

From microscope to cover

The report's most recognizable element, the kaleidoscope patterns on the cover and chapter openers, begins each year as a pile of raw material: 57 microscopy scans submitted by research groups from both IMBA and the IMP. The design team transforms them using a custom tool they built in Photoshop, which algorithmically mirrors and tessellates each scan into radial compositions. The tool lets them shape each kaleidoscope individually rather than relying on a preset or filter. "It adds to patterns that already exist in the scans," says Hinckley. Not every image survives. "Many transform dramatically with scale," he says. "They can reveal real strength at one size and lose all impact at another." The team experiments, discards, and experiments again until a handful remain. "We still think it's quite magical to find something that every scientist can see themselves in," says Ördög. "That's rare."

The designers don't have the last word, though. The IMBA/IMP communications team invites staff across both institutes to vote on the kaleidoscope images, and this year nearly 200 people weighed in to choose the covers. The winning designs were printed on boards and mounted on a six-foot easel for their debut at the annual Christmas party. However, getting them there proved to be a challenge in its own right. When Adam Cooper, Senior Communications Officer, and Benedikt Mandl, Head of Communications and Events, carried the easel out to a waiting taxi, the driver took one look, closed the door, turned the car around, and left without a word. Welcome to Vienna.

Getting it into your hands

The first report the team produced for IMBA was much busier: more boxes, more images, more text packed onto every spread. Over three years, the design has moved toward something cleaner and more structured following feedback from focus groups drawn from across the institutes. The task is one of translation. Scientists and designers think about the page differently. Scientists often engage with content while designers focus on how space structures that content.

57

the number of microscopy scans submitted by research groups at IMBA and the IMP as raw material for the kaleidoscope cover images

So when the feedback says "make the pictures bigger," the designers have to interpret that. "We have to think about what that actually means," says Ördög. "Less text? Fewer boxes? And then you realize that what it's really doing is freeing up space for the spreads to breathe." The result, three editions in, is a publication that has become steadily more refined, shaped not by one perspective but by many.

There is a broader principle at work here, too. If the design of this report is doing its job, you shouldn't notice it. "Readers should experience it, but not think about it," says Hinckley. And that experience matters, because these reports are, at the end of the day, physical objects. Something you hold, flip through, take away with you. In a world where scientific reporting has largely gone digital, that matters more than it might seem. "When it goes online, no one comes in contact with it in the same way," says Ördög. A printed publication creates a different kind of encounter and gives the institutes a presence beyond the data. It sits on a hallway table where a PhD student picks it up between experiments. It lands on the desk of a group leader preparing for a review. It travels home with a postdoc who wants to show someone what this place is really like. It has to work for all of them.

"Normally, I would tell people that if you really want to know what happens at a research institute, don't read its research report," says Cooper. "Most of them aren't made for the people inside the institute. We saw this as a chance to create the anti-annual report by writing for our colleagues, about their work lives, and involving them from the start. If it works, they wouldn't just read it, but see the place they know in a new way."

The journey from idea to print

These reports went through months of brainstorming, photography, interviews, voting, and revision before a single layout was finalized. Here's how that process unfolded.

August 2025

Opening the process
Research groups and service teams across IMBA and the IMP are invited to schedule team portrait sessions.

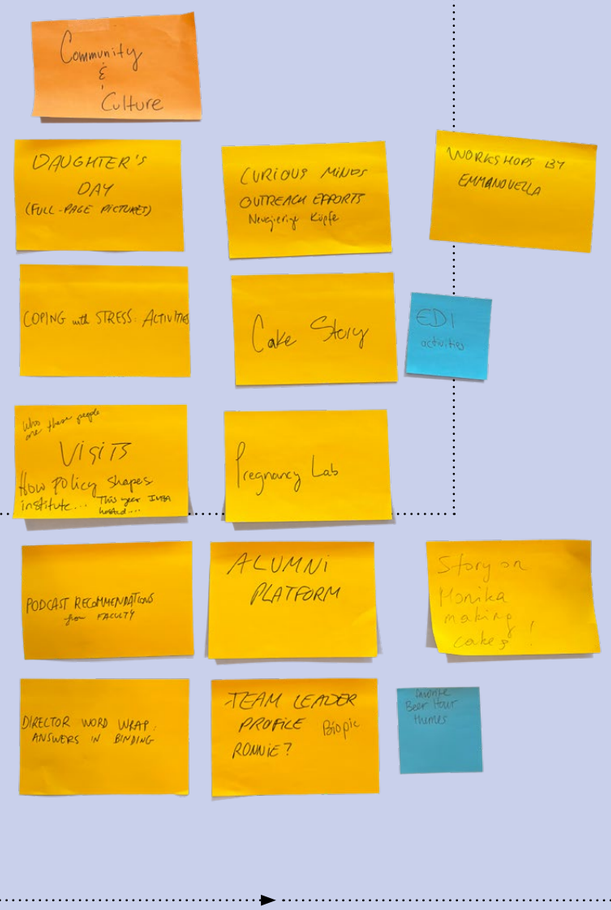
6 OCT
MONDAY

Time	Event
09:10	Anna arrives
09:30–10:00	Cleaning Team - Bridge
10:00–10:30	IMP Diana Pinheiro group only
10:30–11:00	MBS MediaLab - Special Location (IMP 2.012)
11:00–11:45	IMBA Anton Goloborodko - atrium
12:00–12:45	IMP Alex Stark - IMP Lobby
12:45–13:30	Lunch
13:30–14:15	IMBA Sasha Mendjan - Lab
14:15–14:45	IMBA Elly Tanaka Group Only - Atrium
14:45–15:30	Plants Group meet in front of glass house D
15:30–15:55	*Free slot cancelled*
16:00–16:20	IMP Peters Group only

NOTES
16:15 Makeup photo: Juan Augusto Maya, Balzarotti Group
16:15 Makeup photo: Julia Leodolter, Clausen Lab

September 2025

Story brainstorming
Community members contribute story ideas on posters placed in high-traffic areas. These lead to the development of story maps and emerging themes for the reports.



> **"We saw this as a chance to create the anti-annual report by writing for our colleagues, about their work lives, and involving them from the start. If it worked, they wouldn't just read it, but see the place they know in a new way."**
>
> **Adam Cooper, IMBA/IMP**

October 2025

Capturing the institutes in photographs
Across multiple sessions for portrait, team, and mood photography, the project team documents the people and groups advancing discovery at IMBA and the IMP. The project brings together three institutes, 36 research groups, 16 support teams, four administrative and infrastructure teams, ten research and support groups photographed in their laboratories and facilities, and 316 portrait studio participants.

Peter Duchek (Fly and Worm Facility), Tibor Kulcsar (Graphics), and Hans-Christian Theußl (Transgenic Service) prepare the portrait studio.

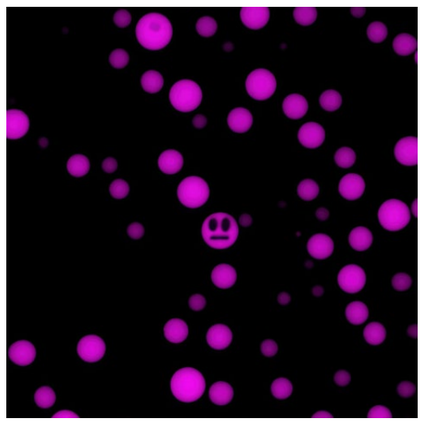
The Obenauf lab (IMP) sits for a group photo, taken by Anna Stöcher.

Open call to the institutes
Research groups are invited to submit visuals that could become kaleidoscopes for the report, and PhD students and postdocs also begin contributing candidate research images, expanding the pool of visual material drawn directly from ongoing research. A vote is organized on a 2025 paper to be highlighted as a feature story.

Hi Adam!

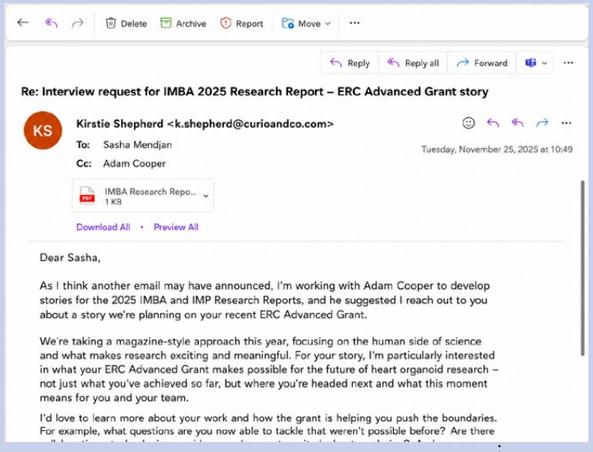
I have a cute image of phase-separated chromatin droplets. I wanted to test a common effect where high laser power can cross-link chromatin (likely the DNA gets cross-linked). To test this, I used high laser power to draw a face on the droplets. The face stayed visible and didn't disappear. Normally, these droplets are liquid-like, so under low laser power, the face would fade away within 2-3 minutes. However, in this case, the image was taken after 30 minutes, and the face was still there.

Best,
Mustafa

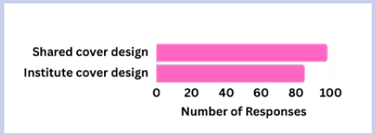


November 2025

Interviews begin
Kirstie Shepherd, a Vienna-based journalist, is introduced to the campus and some staff members during a social hour. More than 45 people eventually participate in interviews for the reports.



Choosing the kaleidoscopes
Nearly 200 staff members vote on the kaleidoscope images that will be used on the report covers.



December 2025

The community sees the covers
The kaleidoscope covers are presented at the annual Christmas party, giving staff across both institutes their first look at the visual identity of the 2025 reports.

January 2026

Revising the stories
Follow-up questions are sent to interviewees to clarify details and refine the narratives.

> **"Many kaleidoscope images transform dramatically with scale. They can reveal real strength at one size and lose all impact at another."**
>
> **Mark Hinckley, The Gentlemen Creatives**

February 2026

Testing the layout
Mock layouts are reviewed with researchers and service teams from IMBA and the IMP to test structure, visual style, and story clarity. Paper is selected from samples for covers, content pages, and banderoles (the printed bands wrapped around the finished report).

Lisa Meadows (Vienna Drosophila Resource Center) and Ezra Levy (Pauli lab, IMP)

March 2026

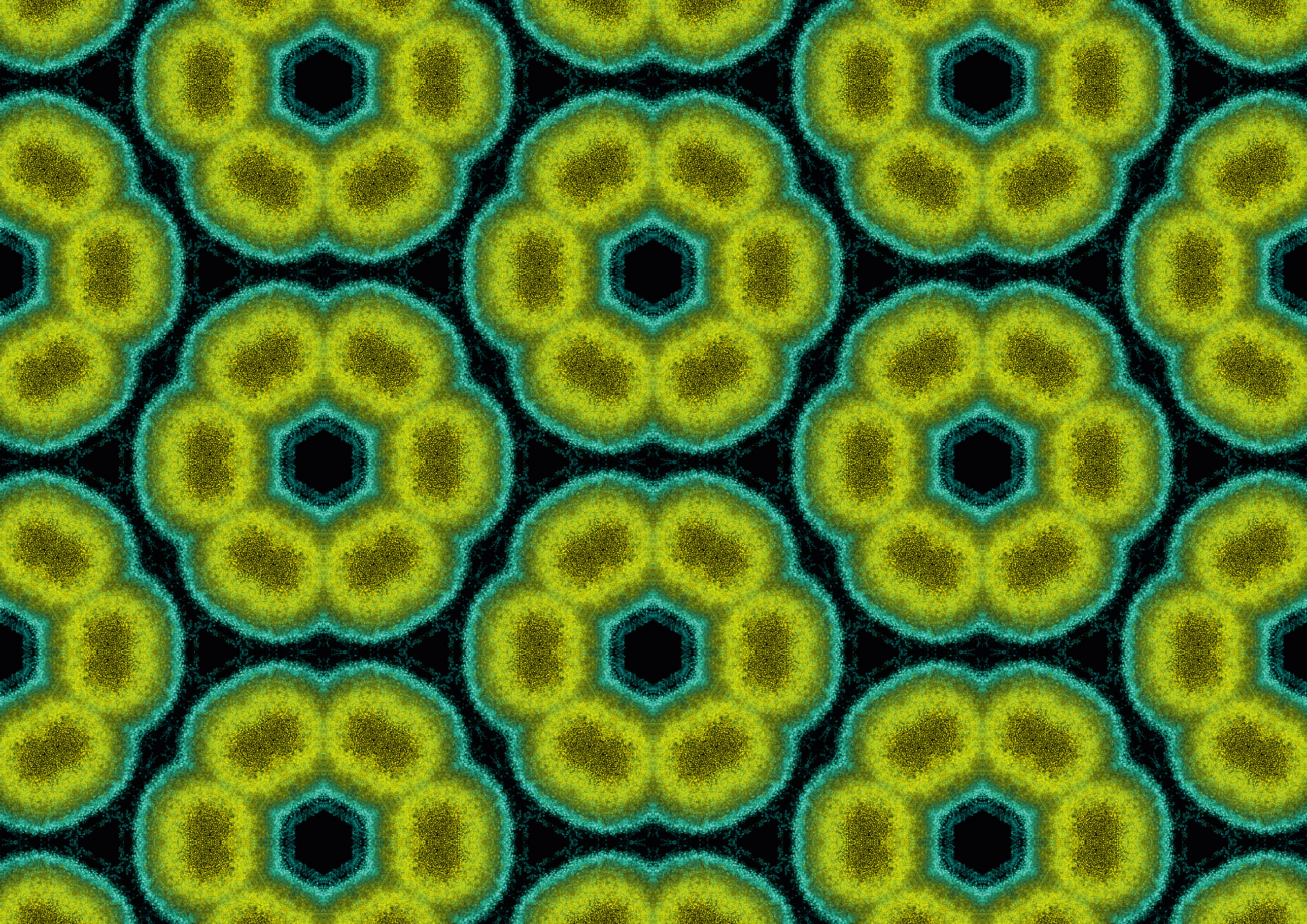
Finalizing the stories
Interviewees review the stories for accuracy before publication, ensuring the details of their work and their words are represented correctly.

> **"We still think it's quite magical to find something that every scientist can see themselves in. That's rare."**
>
> **Richard Ördög, The Gentlemen Creatives**

May/June 2026

Going to print
The final layouts, texts, and images are approved. The reports and supplement go to print and are prepared for distribution across both institutes.

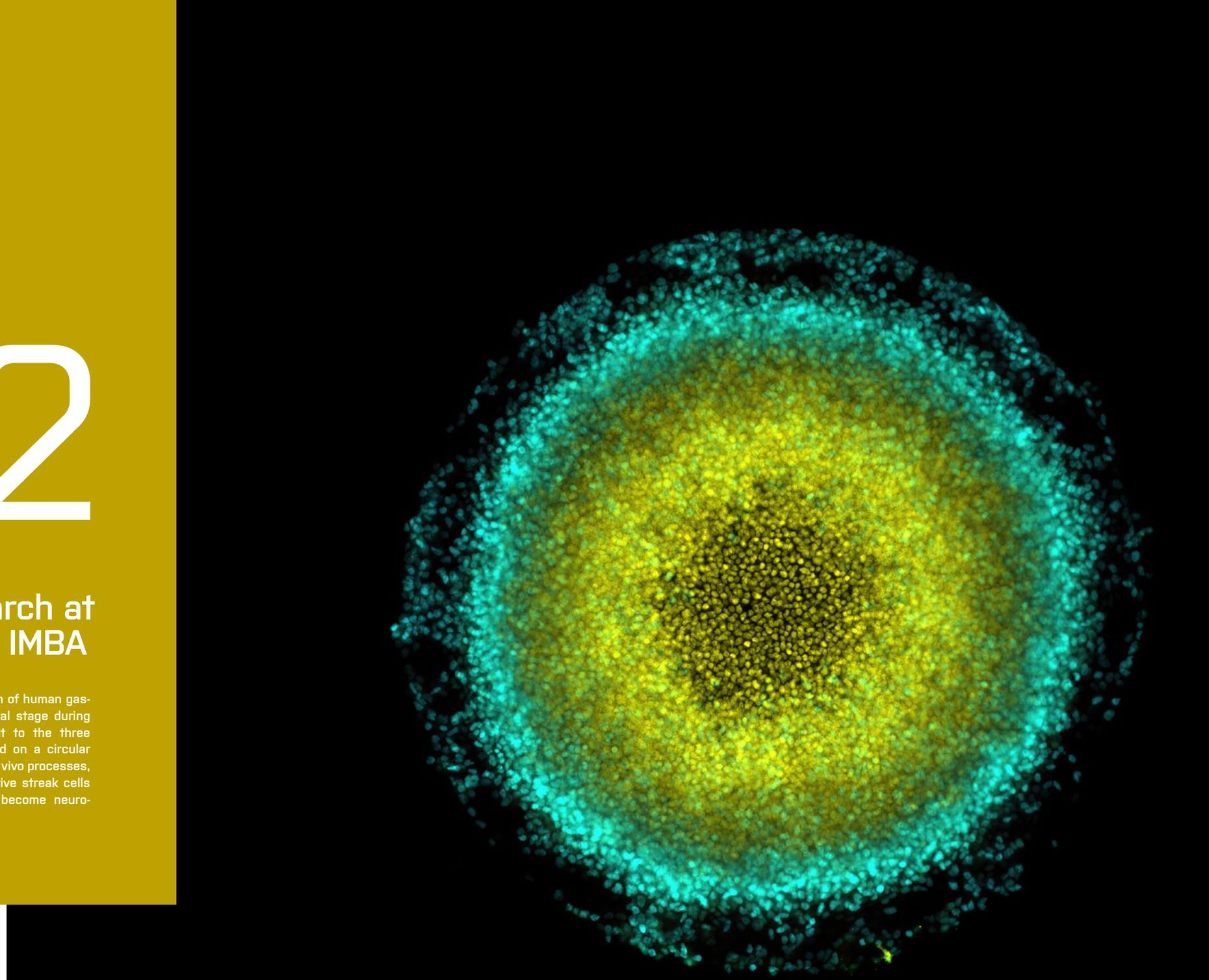
For the past three years, a ten-person team at the Gentlemen Creatives has designed and produced the IMBA research report. This year, the scope grew to include the IMP research report.



02

Inside research at the IMP and IMBA

A stem cell-based model system of human gastrulation, an early developmental stage during which pluripotent cells commit to the three germ layers. Cells are confined on a circular micropattern and recapitulate in vivo processes, such as the migration of primitive streak cells (blue) beneath cells fated to become neuroectoderm (yellow).



2025, ALP ÖZEL, STAPORNWONGKUL LAB

When collaboration breaks the mold

A Brennecke-Klumpe partnership shows how an atypical collaboration structure can yield breakthrough discoveries.

MANEL LLADO

Although they approached the question from completely different angles, genetics versus cellular ultrastructure, Julius Brennecke and Sven Klumpe recognized a shared passion.

Most scientific partnerships are brief encounters built to solve a specific problem. One lab needs a technique, another provides it. They publish and part ways. According to a 2022 study published in *PNAS* that tracked over 80,000 researchers, 63 percent of collaborators work together on just one research topic before moving on. The model is efficient: identify a gap, find expertise to fill it, produce results.

But not every collaboration follows this formula. The partnership between IMBA geneticist Julius Brennecke and IMBA-IMP structural cell biologist Sven Klumpe was different from the start.

63%

of scientific collaborators work together on just one research topic before moving on to separate projects, according to a 2022 study in the journal *PNAS* tracking over 80,000 researchers across disciplines

Driven by curiosity, not necessity

Neither Brennecke nor Klumpe set out looking for the other's expertise to solve a specific problem. "Our collaboration is not really purpose-driven," Brennecke explains. "It's driven by a common fascination."

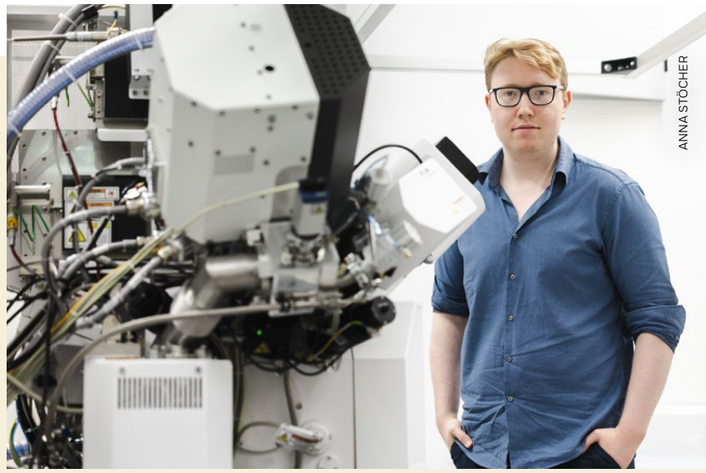
Both were fascinated by retrotransposons, mobile genetic elements that copy and paste themselves across genomes. Brennecke, a group leader at IMBA, had spent years studying how cells defend against these "jumping genes" through the PIWI pathway. Klumpe, then a member of the Plitzko lab at the Max Planck Institute of Biochemistry in Martinsried, had developed cryo-electron tomography techniques to visualize biological structures in their native state. When he encountered virus-like particles formed by retrotransposons in his microscopy data from fly ovaries, conversations with Brennecke's group helped him contextualize his findings.

> **"Our collaboration is not really purpose-driven. It's driven by a common fascination."**
>
> **Julius Brennecke, IMBA**

Although they approached the question from completely different angles, genetics versus cellular ultrastructure, they recognized a shared passion. "While doing this," Brennecke recalls, "I think we figured out we have the same general philosophy about how to do science."

Building on relationships, not just expertise

That philosophy starts with who does the work. "It always boils down to identifying amazing people," Klumpe explains, "and then supporting them in what they want to achieve." Both scientists run their labs with flat hierarchies. Brennecke insists that a Master's student deserves the same attention and supervision as a postdoc. Unlike typical collaborations, where communication is limited to formal channels between principal investigators who coordinate their teams' interactions, in this partnership, scientists could talk freely and directly about data and questions as they emerged.



ANNA STÖCHER

Klumpe with his new machine. When Klumpe encountered virus-like particles formed by retrotransposons in his microscopy data from fly ovaries, conversations with Brennecke's group helped him contextualize his findings.

Usually, each collaborating lab will also maintain clear boundaries around its own expertise. Often, one side handles the biology and the other provides technical expertise. The work proceeds in parallel, with results combined only at the end. Brennecke and Klumpe crossed those boundaries, valuing exploration over defending expertise. "I like stepping into new fields," Klumpe says, "because that's usually where I learn the most and where new ideas emerge."

> **"It always boils down to identifying amazing people, and then supporting them in what they want to achieve."**
>
> **Sven Klumpe, IMP-IMBA**

For Klumpe, that curiosity took him into unfamiliar territory. "My scientific training centered around protein structure and function in cell biology," he says. "Through this collaborative work, I've learned a ton about piRNAs and about the important role of small RNAs in germline biology." Instead of contributing separate pieces to be assembled later, they challenged each other's thinking throughout, drawing insights from both genetics and structural cell biology.

What the collaboration enabled

Their partnership produced the first high-resolution structural snapshot of a retrotransposon inside a living cell. Published in the journal *Cell* in March 2025, the work revealed how these ancient "jumping genes" navigate the cellular landscape.

The discovery required both merged thinking and complementary contributions. Klumpe had stumbled upon something unusual: copia, a retrotransposon that naturally evades cellular defenses and remains active in wildtype flies. This gave them a clean system to study one active element in its natural environment, rather than the chaos that results when researchers artificially disable cellular defenses to activate all transposons at once. Klumpe's cryo-electron tomography provided the cell biological discovery. Brennecke's expertise in the PIWI pathway provided the genetic underpinning of the observation. Their collaboration merged imaging technique with genetic system and structural understanding with biological contextualization to achieve what neither could have alone.

Beyond publication

Since their paper published in the journal *Cell*, the partnership has continued to evolve. Klumpe joined the campus as a fellow at IMBA and the IMP in spring 2025, and being on the same campus has opened new possibilities to work together and quickened the pace of collaboration. What began with shared fascination now extends into new questions, new projects, and the kind of ongoing scientific conversation that defies the usual publish-and-move-on pattern of academic research.

As Klumpe puts it simply, "That paper is only the beginning."

Zeng, A., Fan, Y., Di, Z., Wang, Y., & Havlin, S. (2022). Impactful scientists have higher tendency to involve collaborators in new topics. Proceedings of the National Academy of Sciences, 119(48), Article e2207436119. https://www.pnas.org/doi/10.1073/pnas.2207436119

PUBLICATION

In-cell structure and snapshots of copia retrotransposons in intact tissue by cryoelectron tomography. Sven Klumpe, Kirsten A. Senti, Florian Beck, Jenny Sachweh, Bernhard Hampoelz, Paolo Ronchi, Viola Oorschot, Marlene Brandstetter, Assa Yeroslaviz, John A.G. Briggs, Julius Brennecke, Martin Beck, Jürgen M. Plitzko. *Cell*. DOI: 10.1016/j.cell.2025.02.003

ACKNOWLEDGMENTS

Papers encompass teamwork beyond authors. For this one, the PIs would like to acknowledge the contributions of Marlene Brandstetter, who helped push the paper across the finish line, as well as the Max Planck Institute of Biochemistry and the EMBL Heidelberg EM Core Facility.

ADAM COOPER

The Brennecke lab uses fruit flies to explore the molecular principles and evolutionary implications of genetic conflicts. Brennecke, a group leader at IMBA, had spent years studying how cells defend against these "jumping genes" through the PIWI pathway.

The questions that keep us curious

The scientists behind this year's research stories share the questions that haunt, inspire, and occasionally humble them.

Every scientist lives with unanswered questions, the kind that linger long after the lab lights go out. While working on the 2025 IMBA and IMP research reports, we asked the people involved in those stories to share one question they'd most like answered: not just future directions for their work, but the ones that nag at them during seminars, pop up over coffee, or keep them wondering late at night. Some chose mysteries close to their own work. Others went bigger.

Inside the cell

The molecular world is crowded and chaotic. Basic processes remain mysterious.

"How exactly does Foxp3 regulate gene expression?"
Christina Jäger, PhD student, van der Veeken Lab, IMP

"In a crowded cell, how do proteins find each other at exactly the right moment?"
Júlia Portell i de Montserrat, PhD student, Brennecke and Plaschka labs, IMBA and IMP

What we can't yet measure

The right tools haven't been invented yet.

"If we could visualize an entire organism at molecular resolution, what would we discover?"
Sven Klumpe, IMP-IMBA Fellow

"What nutritional environment does an early embryo actually experience?"
Kristina Stapornwongkul, Group Leader, IMBA

"What new biology will we uncover when we develop methods to look inside tissues in different ways, at different resolutions?"
Elly Tanaka, Scientific Director, IMBA

Beyond earth

Imagination reaches as far as the cosmos.

"What does life look like on other planets?"
Jan-Michael Peters, Scientific Director, IMP

Medical frontiers

The stakes for human health are immediate.

"How do we detect tumors early enough to prevent them from spreading?"
Anna Obenauf, Senior Group Leader, IMP

"Why can axolotls regrow their arms, but humans can't?"
Helena Okulski, Tanaka lab, IMBA

The limits of understanding

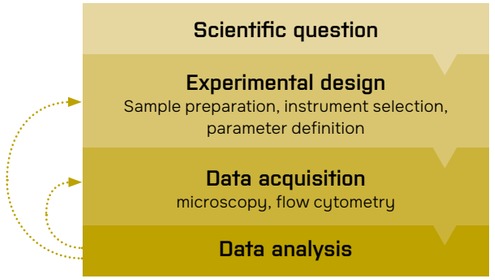
Some mysteries carry their own questions.

"Will we ever, or should we ever, fully understand the human mind?"
Philipp Dexheimer, IMP alumnus and artist

Confessions of Core Facilities

Where brilliant ideas meet physical reality, and scientists wish you'd talk to them sooner.

At the Histology Core Facility, Mihaela Grivej (left) helps scientists turn tissue samples into visible, interpretable evidence, from sectioning and staining to immunohistochemistry. Her work supports researchers across IMBA and the IMP by providing the technical precision needed to study tissue structure, disease phenotypes, and cellular markers.



Starting with an initial scientific question, the BioOptics team collaborates with researchers at IMBA, the GMI, and the IMP on experimental design, assisting with instrument selection and parameter definition while providing training and guidance for data acquisition and subsequent analysis.

Every day at the Vienna BioCenter, scientific ambitions collide with the laws of physics, chemistry, and (occasionally) frog respiratory volume. This is where core facilities live: in the space between "I want to do this" and "here's how we actually make it happen."

But first, a confession: even the term "Core Facilities" is misleading. On the scientific side alone, it covers multiple facilities, among them: Bioinformatics, BioOptics, Electron Microscopy, Histology, Metabolomics, Molecular Biology Services, Molecular Tool Development, Next Generation Sequencing, Peptide Synthesis, Plant Sciences, Preclinical Phenotyping, Protein Technologies, Proteomics (Tech Hub and Services), and the Vienna Drosophila Resource Center. These facilities sit across multiple organizations (GMI, IMBA, IMP, VBCF), some jointly operated and others not. "It's quite a complex landscape," admits Vivian Lu Tan, Managing Director of Vienna BioCenter Core Facilities (VBCF), who also oversees a number of these shared facilities. "We are very much collaborating with each other. Our customers come from all over the campus and from institutes far beyond it."

Behind every protocol or dataset are months of optimization, specialized capabilities, and experienced scientists with stories to tell. As it turns out, they had plenty to say for this story, and they were glad of the chance to say it.

The translation layer

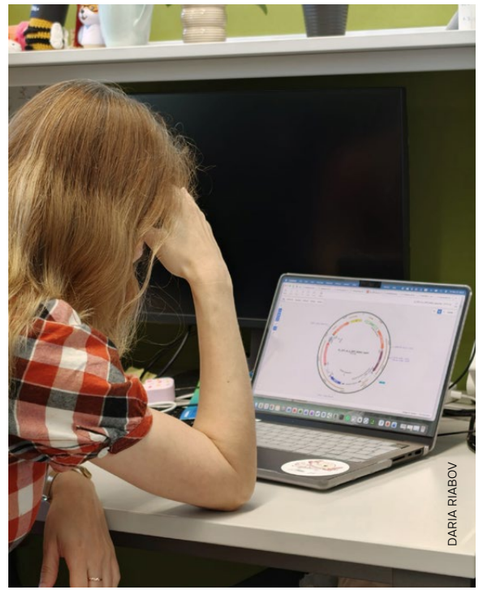
Core Facilities work best in partnership with researchers, but the full depth of experience behind the equipment and protocols is something researchers don't always think to draw on. At BioOptics, for example, that experience spans the entire research workflow, from experimental planning through to data analysis. But that support only works if the right questions get asked at the start. Karin Aumayr, Head of the BioOptics Facility, explains: "The way we work is that our users have to give us the story. They should come and say, 'I want to test this,' and then we can help them."

The work behind the work

Long before the first sample arrives, facilities are working. "What my users won't see is all the troubleshooting I'm doing now to set up every step of the protocol," says Daria Riabov, Project Lead of the Robotics Team at IMBA. "Test every step, see it fail, optimize volumes. In the end, I'll present a smooth pipeline, but it's already taken me several months."

One recent case illustrates the point. Riabov spent over a month troubleshooting a gene editing protocol, trying every combination of reagent concentrations before tracing the problem to a faulty batch from one of the most trusted suppliers in the field. "This is precisely the kind of setback that facilities absorb so that researchers don't have to," Riabov says.

Then there's the maintenance people never see. When Kirill Salewskij, Project Lead of Tissue Culture Support Team at IMBA, moved from being a user to running a facility, he was surprised. "When you see how much time and money it takes to replace one single item essential for operation, that's quite shocking." An electronic pipette costs up to 1500 Euro, a single rack of compatible tips is 60, a cell counter 5000 Euro.



Daria Riabov considers how to improve the efficiency of a CRISPR-Cas9 editing strategy in a stem cell line.

Since the Tissue Culture Support team documents culture plates frequently, the time-saving effects of automating small processes compound quickly. BioOptics found a solution by repurposing a microscope and pairing it with a new camera, enabling fast, software-controlled objective selection and scale bar production.

The costs compound quickly. When a microscope needed to be replaced for Tissue Culture Support, BioOptics found a solution by repurposing an unused microscope and pairing it with a new 1000 Euro camera, saving tens of thousands in the process.

The work done in Core Facilities can sometimes have an unexpected reach. A collaboration with researchers from the Knoblich lab at IMBA led Agnieszka Piszczek, Head of the Histology Facility (VBCF), to co-author a methods paper in the journal *Cell Reports Methods*. The custom tissue molds described in the paper allow up to 19 cultured organs or around 110 cerebral organoids to be processed simultaneously, cutting the cost and time of tissue analysis by up to 96 percent. No commercial product existed to do this before. "We're constantly working in the background to make things faster, to introduce new things," says Piszczek.

The cabinet of curiosities

The most memorable moments are those that come with discoveries, when "you're looking at something as the first person in the whole world," says Piszczek. She recalls preparing slides of organoids that a researcher had been developing for weeks, hoping they'd produce blood cells. "The moment we saw positive results, it was a huge celebration."

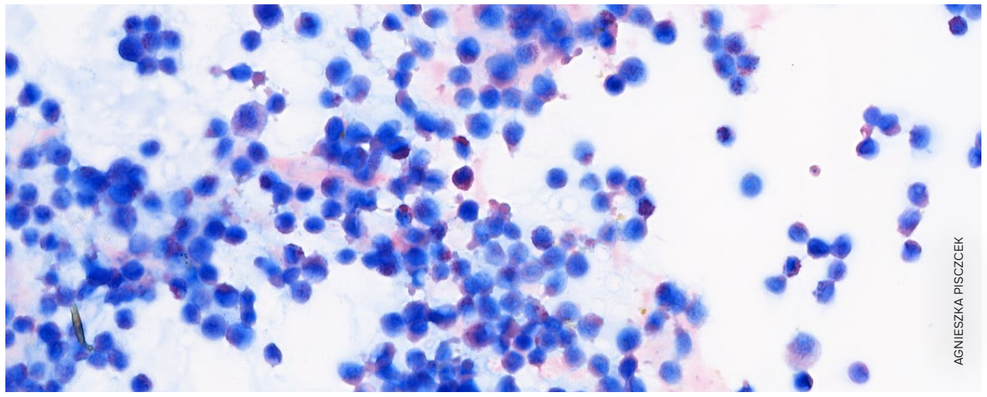
The feedback loop

Facilities are quietly rooting for every project they touch, and nothing beats hearing your good news. "Coming back and saying, 'That was a great idea, it actually worked,'" says Aumayr. "If it doesn't work, they come back because they need help. But if something worked, we don't get to know often enough."

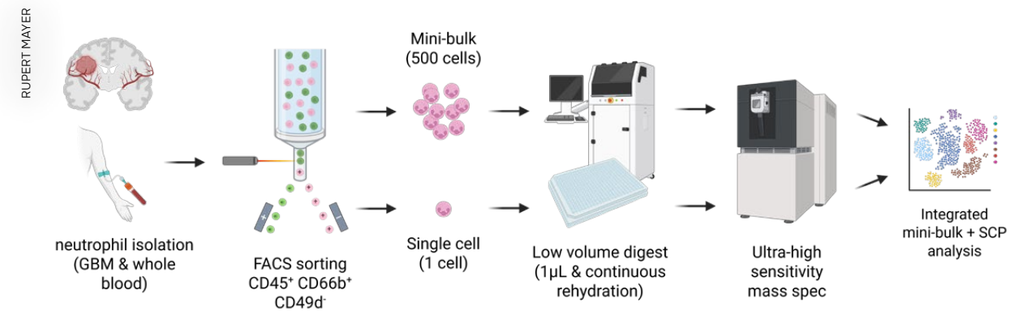
Lisa Meadows, Head of the Vienna Drosophila Resource Center, tracks acknowledgments at the year's end. "I see which publications acknowledged us. That's not all the labs that used our resources, but it's a good representation, and for us, a moment of pride."

The acknowledgements themselves are creatively varied, and that variety is, in its way, a sign of how many researchers the facilities touch. "We get acknowledged as VBCF facility, IMBA GMI facility, IMP GMI facility," Aumayr laughs. "Sometimes even as 'VBC,' which isn't a facility, of course." Facility staff know the variation is rarely intentional. "It's a simple matter of out of sight, out of mind," says Riabov. "It's easier to acknowledge the people you see in the lab every day." To help, each facility publishes a standardized acknowledgment template on their website, and facility heads are always glad to confirm the right wording.

> **"I see which publications acknowledged us. That's not all the labs that used our resources, but it's a good representation, and for us, a moment of pride."**
>
> **Lisa Meadows, Vienna Drosophila Resource Center**



Giemsa staining of organoid-shed cells confirms what the researchers had hoped for: the cells are of hematopoietic origin, confirming that the organoid is capable of producing artificial human blood.



The Proteomics Tech Hub works with research labs on and off campus to develop workflows for single-cell proteomics, structural proteomics, and spatial omics. Seen here is a protocol developed with the Walmsley Lab (University of Edinburgh) to analyze the proteome of single neutrophil cells from brain tumors of glioblastoma (GBM) patients and whole blood.

Scientists in the workflow

The science happening in Core Facilities doesn't always make it into the acknowledgements section of a paper, but it's there. When Rupert Mayer, Senior Core Scientist at the Proteomics Tech Hub, re-analyzed a set of samples from the Berger lab using a new methodology, the results substantially improved on the original protein identifications and revealed novel potential interactors, leading to a joint publication in the journal *Nature Communications*. That publication is one example of what the Proteomics Tech Hub takes on. For another project, they analyzed the proteome of single cells from brain tumor patients: "There are only a handful of labs in the world that actually do single-cell proteomics, and we did it on clinical samples from patients," says Mayer.

Meanwhile, Riabov is working on something that has not been done in the Robotics Project yet: adapting automated liquid handling robots to carry out tissue culture work, including cell feeding and splitting, with the goal of increasing reproducibility and freeing up researcher time. The process will take many months and requires programming protocols for different cell types from scratch.

Those projects, and others like them, feed into a body of work that spans the campus. Meadows's facility supports 400 to 500 publications per year.

> **"There are only a handful of labs in the world that actually do single-cell proteomics, and we did it on clinical samples from patients."**
>
> **Rupert Mayer, Proteomics Tech Hub**

Better together

Stronger relationships between researchers and Core Facilities don't happen by accident. Tan has built structures to make sure the conversation goes both ways. "The most important thing is really the engagement of the users. Because it's not just about engaging with the facilities directly. It's also about engaging with the management of their own institutes. This is actually how we could get the feedback loop going." VBCF already runs an annual survey, rating scientific services on speed, quality, and pricing. The results benchmark performance across facilities and feed directly into how services develop.

Core Facilities are most valuable when the relationship starts before the samples do. Researchers who engage early get more than a service: they get a collaborator who knows the science, understands the constraints, and has probably solved a version of the same problem before. And when the experiment works, the people who helped get there would love to know. After all, those celebrations are worth sharing.

> **"The most important thing is really the engagement of the users. Because it's not just about engaging with the facilities directly. It's also about engaging with the management of their own institutes. This is actually how we could get the feedback loop going."**
>
> **Vivian Lu Tan, Vienna BioCenter Core Facilities**

Explore the wide range of services supporting research services both at the bench and away from it at the Vienna BioCenter.

Administration and infrastructure

Core facilities are where experiments meet technical reality. Behind them, a broader operational system ensures experiments are made possible long before they begin.

Laboratories are relocated in phases as construction on new cooling systems progresses. At the same time, safety training is updated, incidents are analyzed and translated into new rules. In parallel, IT systems are maintained and secured, from high-performance computing to the lifecycle of individual devices. Meanwhile, laboratory documentation is standardized through the rollout of electronic lab notebooks.

These practical changes are a snapshot from a year of meetings between administration and infrastructure teams, coordinated across the IMP, IMBA, and the GMI by Harald Isemann, Barbara Kraus, and Markus Kiess, who align infrastructure, finance, compliance, and operations to support ongoing research.

Administration and infrastructure teams are coordinated by Managing Directors Harald Isemann and Barbara Kraus.

IMBA IMP

Explore the teams, infrastructure, and systems behind daily research operations.

Recently, Facility Management (above) and Lab Support (not pictured) coordinated a cooling system upgrade, the reconstruction and move of the Tanaka lab, the installation of a focused ion beam scanning electron microscope (FIB-SEM) for the Klumpe lab, and the renewal of the atrium glass facade.

In 2025, the IT department co-led the implementation of SuccessFactors, updated the manuscript submission system for researchers, further strengthened the institute's security, and provided researchers with access to MUSICA, a new high-performance computing cluster in Vienna.

Honoring the unfinished journey

Sakurako Nagumo Wong's Rabitsch Award recognizes the stubborn determination behind breakthrough research and supports the crucial space to finish it properly.

THOMAS GEORGE MINCHINGTON

Sakurako Nagumo Wong

Six months after her PhD defense, Sakurako Nagumo Wong is at her desk in Jürgen Knoblich's lab at IMBA, wrapping up two ambitious projects that are on their way to being published. But the 2025 Rabitsch Award isn't waiting for her work to be tied up in a neat bow. Instead, it supports the hard work required to finish the job.

Two projects, one stubborn scientist

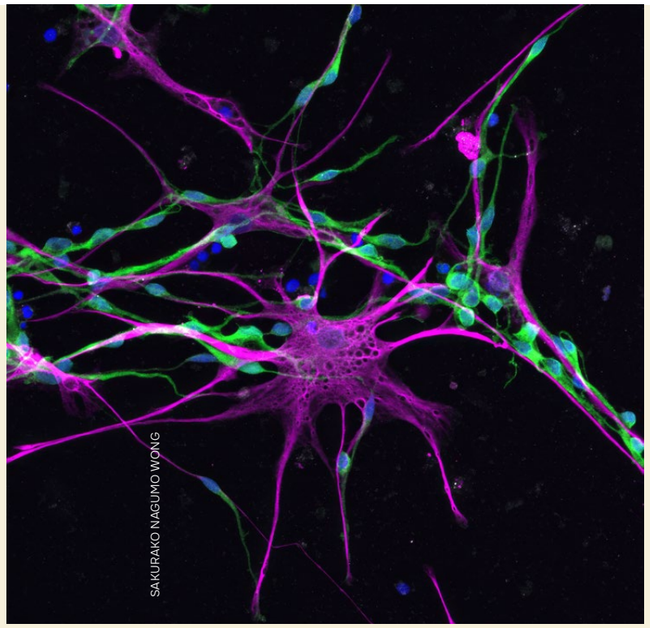
Nagumo Wong's award-winning research leveraged cerebral organoids to reveal previously unknown aspects of human brain development. In one project, she recapitulated chains of interneurons migrating into the cortex after birth, sliding over each other within tunnels formed by astrocytes. This is a uniquely human phenomenon with implications for autism and schizophrenia. In her second project, she used patient-derived organoids to model epileptogenesis in a genetic disorder that causes benign tumors in the brain and other organs, Tuberous Sclerosis Complex, showing that abnormal electrical activity could be partially rescued with drug treatments.

Taking on two projects instead of one? She admits she wouldn't recommend it to anyone else, including her younger self. "Would I have listened? Probably not," she laughs. "I think I'm pretty stubborn." For a young scientist with ambitious ideas and the drive to see them through, the Rabitsch Award provides support to complete the journey she's started.

Honoring a legacy

Nagumo Wong received the award at its 20th anniversary ceremony. Established in 2006, the award honors Kirsten Peter Rabitsch, a promising IMP scientist who had just completed his doctorate when he and two others were tragically killed in 2006. The award is jointly supported by

"The award was a validation that said, you've done good work. It gave me confidence to continue in research."



SAKURAKO NAGUMO WONG

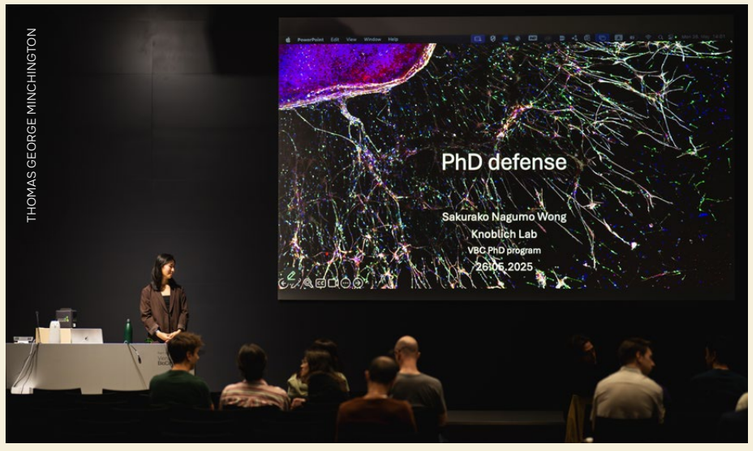
Nagumo Wong's award-winning research leveraged cerebral organoids to reveal previously unknown aspects of human brain development. Pictured here are late-born interneurons migrating in chains along astrocytic processes. Interneurons: green. Astrocytes: magenta

Rabitsch's parents and the IMP. For Nagumo Wong, receiving an award named after someone who never completed his scientific journey adds particular meaning at this stage of her own career. "It made me even more grateful and created this need to honor it and continue to do good research," she says.

A springboard for scientific careers

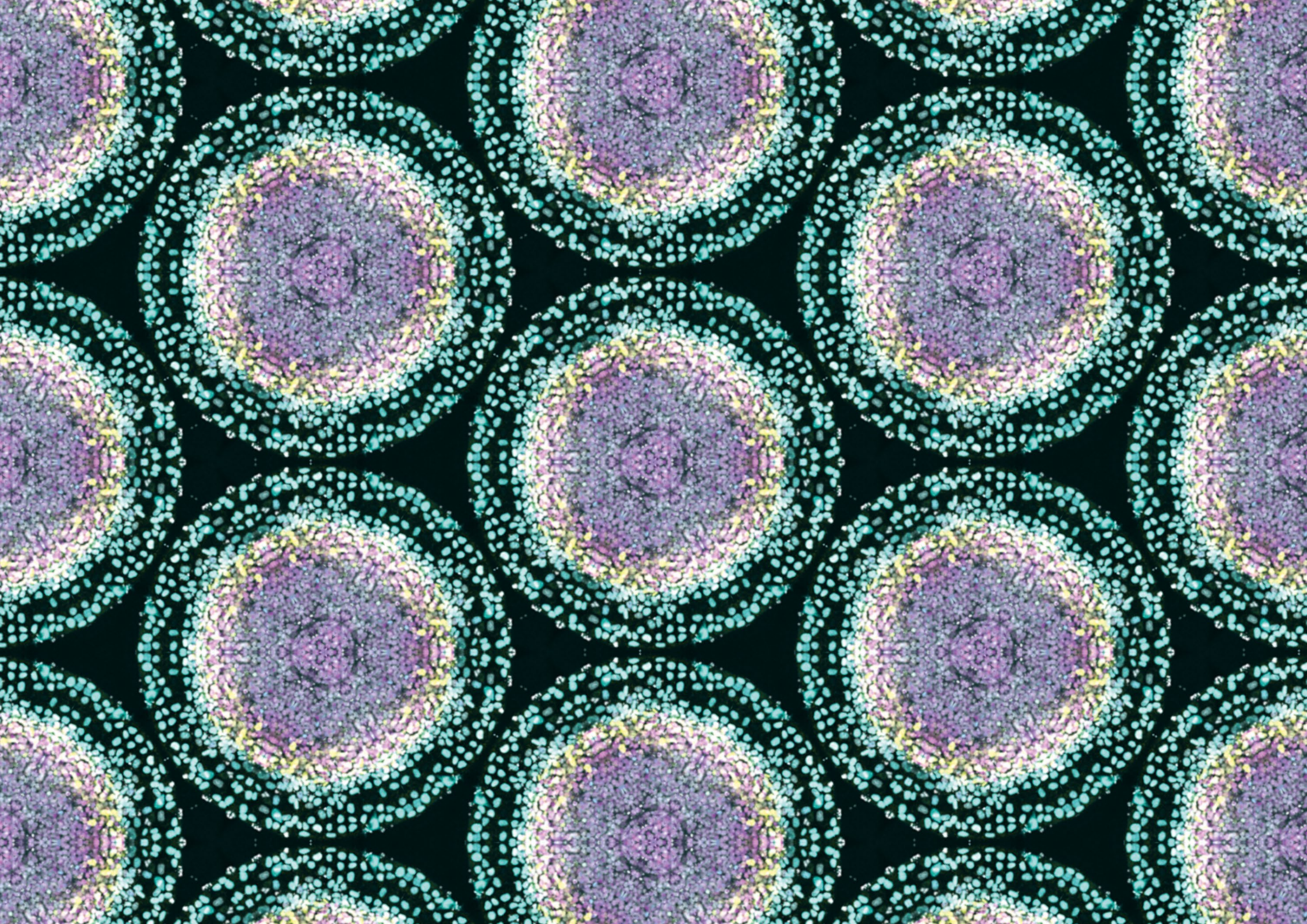
The Rabitsch Award has a track record of recognizing future scientific leaders. Past recipients have gone on to establish independent research groups and lead teams at major institutions. Elif Eroglu, who won in 2014 for her thesis on chromatin remodeling in the Knoblich lab, is now a Principal Investigator at the Karolinska Institutet in Sweden. Jakob Fuhrmann, the 2008 winner for his work on arginine phosphorylation in the Clausen lab at the IMP, currently leads a peptide discovery lab as Senior Principal Scientist at Genentech. Ralph Neumüller, who won in 2007 for research on the development of tumors in the Knoblich lab, now heads Cancer Cell Signaling at Boehringer Ingelheim. Julia Batki, presented with the award in 2019 for RNA-guided transposon silencing studied in the Brennecke lab, is now a principal investigator at the Friedrich Miescher Institut in Switzerland.

For Nagumo Wong, the award came at the right moment in her career. She is currently finishing her projects before exploring postdoctoral opportunities in neuroscience. "I've been working on these projects for so long. I need to take a step back and think about what else is out there."



THOMAS GEORGE MINCHINGTON

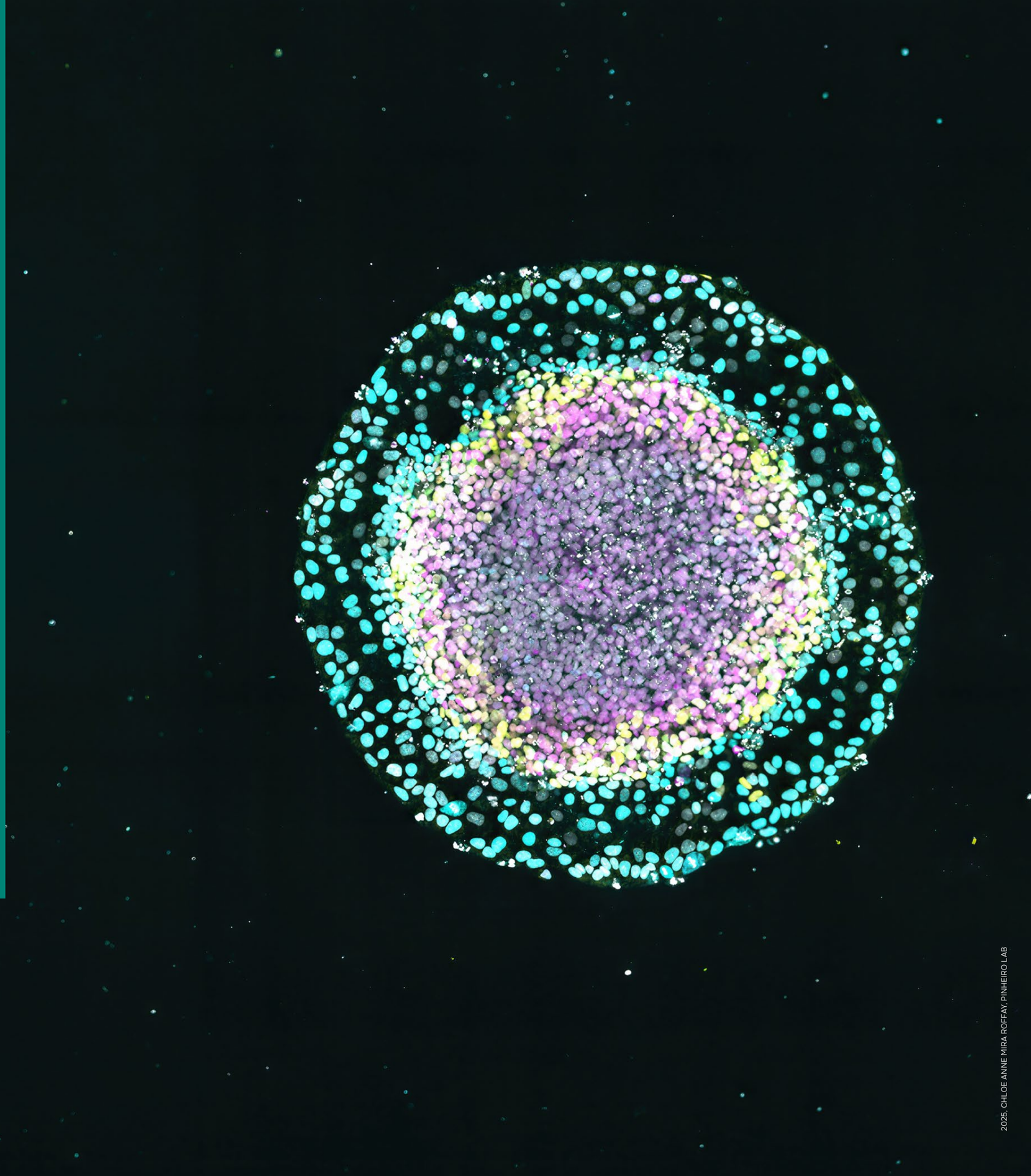
Sakurako Nagumo Wong, a researcher in the Knoblich lab, presented her dissertation titled "Cerebral organoids model postnatal interneuron migration in the human cortex" during her PhD defense.



03

Learning, leading, connecting

A human embryonic stem cell (hESC) based model mimicking gastrulation commonly called a "gastruloid disc." These discs consist of spatially confined colonies of cells induced for 48 hours with BMP4 ligand. The proteins of interest to the Pinheiro lab localize in the nuclei, DAPI (gray) of all the cells, CDX2 (in cyan), amnion cells (e.g., a type of extraembryonic tissue), BRA (yellow) for mesodermal cells, and SOX2 (pink) for ectoderm.



2025, CHLOE ANNE MIRA ROFFAY, PINHEIRO LAB

From lone genius to team science

Modern research is impossible alone, so the Vienna BioCenter Scientific Training Unit is building community from day one.

The stereotype of the solitary scientist isn't just outdated; it's actively misleading. A 2025 study published in the journal *EMBO Reports* tracked authorship patterns over more than a century, revealing that solo-authored papers have dropped from 87 percent in the 1900s to less than seven percent by the 2020s.

This shift reflects a fundamental change in how science gets done. Today's research requires collaboration across labs, disciplines, and continents. Computational biologists work with experimentalists. Separate institutes co-supervise students. International partnerships tackle questions too complex for any single group. Yet many students still start graduate programs with expectations shaped by that outdated solitary model. The Vienna BioCenter's Scientific Training Unit is working to close that gap, not by teaching pipetting techniques or statistical methods, but by teaching scientists how to work with the people in the room.

> **"In academia, we talk about the next step. But the next step can take you anywhere now. The options are genuinely wide open."**
>
> **Eva Schmid, Vienna BioCenter**

The reality check

PhD students and postdocs arrive at the Vienna BioCenter from around the globe, leaving behind their support networks to step into a campus with over 130 research groups, each operating almost like its own small company with distinct priorities and cultures. Newcomers must learn not just the science, but also how to adapt to these different lab environments and build connections among them.

The Scientific Training Unit addresses these challenges by coordinating training for researchers at all career stages across multiple Vienna BioCenter institutes and facilities. The unit oversees the Vienna BioCenter PhD Program, manages interdisciplinary postdoctoral fellowships, and organizes the ten-week Summer School for undergraduate and Master's students. Most importantly, the Scientific Training Unit's programs focus on building the collaborative skills that modern research requires.

87% to 7%

the decline in solo-authored scientific papers in the natural and medical sciences, from the 1900s to the 2020s, according to a study in the journal *EMBO Reports*

BENEDIKT MANDL

Eva Schmid leads the Scientific Training Unit at the Vienna BioCenter.

LUKAS BECK

In laboratory settings, collaboration and communication act as efficiency multipliers with tangible scientific outcomes. Pictured here are Stark lab scientists Sachin Mishra, Myrto Chatziangelou, Michaela Pagani, and Tomas Pachano (left to right).

Building science together

In laboratory settings, collaboration and communication act as efficiency multipliers with tangible scientific outcomes. A study from the *Journal of Investigative Medicine* found that the primary reason scientific teams were unsuccessful was rarely a lack of technical expertise, but rather a failure to manage interpersonal dynamics and communication. However, teams that get this right spend less time navigating friction and more time making discoveries.

Cross-disciplinary communication enables another kind of breakthrough, as high-impact papers increasingly come from teams that bridge diverse fields. Recent Vienna BioCenter PhD Award winners illustrate this. Filip Nemčko received the 2024 award for his thesis linking functional genomics with proteomics, a collaboration between the IMP, IMBA, and the Max Perutz Labs. His work, published in the journal *Nature Methods*, created a new method for tracking protein functions across the entire genome. In 2025, Robert Kalis received the award for his thesis at the intersection of oncology and metabolic research, a collaboration between the Zuber lab at the IMP and Wilhelm Palm's lab at the German Cancer Research Center (DKFZ). His research, published in the journal *Science,* discovered how acidosis in tumors regulates cancer metabolism.

The ability to communicate across disciplinary boundaries is what allows these complex projects to succeed, but interdisciplinary collaborations can feel like speaking different languages, explains Eva Schmid, head of the Vienna BioCenter's Scientific Training Unit.

Tomas Pachano, Sachin Mishra, and Filip Nemcko at the GMI 25th Anniversary. Nemcko, a recent PhD graduate, earned a mention among *Forbes Slovakia's* "30 Under 30" list of 2024 and the Vienna BioCenter PhD Award 2024 for his thesis linking functional genomics with proteomics, a collaboration between the IMP, IMBA, and the Max Perutz Labs.

ANNA STÖCHER

ADAM COOPER

Newcomers must learn not just the science but also how to adapt to different lab environments and build connections among them. Pictured here are Vienna BioCenter Summer School student Alexandre Gureenkov and his mentor Christos Kyprianou (IMBA).

"Researchers must learn each other's vocabulary to bridge fields," she says. "When this works well, truly novel avenues can be explored."

The Scientific Training Unit's three-week Prime Your PhD course meets these needs through modules on communication, expectation management, and explaining complex data to audiences from different fields. PhD students practice with faculty across diverse topics, work in groups to build campus connections, and discuss navigating an international environment. The course covers scientific integrity and collaborative skills that students continue developing throughout their PhD.

"Researchers must learn each other's vocabulary to bridge fields. When this works well, truly novel avenues can be explored."

Eva Schmid, Vienna BioCenter

From following to challenging

These collaborative skills extend beyond peer-to-peer interactions. PhD students also learn to stay open-minded and curious about their working relationship with their supervisor, discovering that the moment when they start challenging their mentor is progress, not transgression.

This might seem counterintuitive in a high-stakes environment where principal investigators are often world-renowned experts, but research supports this approach. A study published in the journal *BMC Medical Education* found that, for PhD students, the ability to engage in productive disagreement was a key indicator of professional growth. As students mature, they begin to defend their own scientific viewpoints, signaling a successful transition from dependence on their PI to emergent mastery of their field.

The Vienna BioCenter Leadership Program, introduced in 2023, reinforces this culture by training supervisors in mentorship and conflict management. The program ensures that collaborative habits extend vertically through lab hierarchies, not just horizontally across peer groups, creating environments where questioning ideas is encouraged rather than discouraged.

BENEDIKT MANDL

At the Vienna BioCenter Leadership Program retreat, participants discuss leadership challenges, learn core leadership and communication principles, and work interactively to shape a shared leadership culture across the campus.

Extending the network beyond the campus

The Scientific Training Unit's work doesn't end when researchers leave campus. This matters because career paths are more colorful in ways they weren't a generation ago when academic positions were a more logical trajectory for successful PhD students. Now it's one of many options. A 2023 study of more than 4500 PhD graduates in the United Kingdom, published in the journal *Studies in Higher Education,* found that over two-thirds of doctoral graduates pursued careers outside of research. "In academia, we talk about the next step," says Schmid. "But the next step can take you anywhere now. The options are genuinely wide open."

To address the diversity of possible career trajectories and foster long-term professional networks, the unit launched an alumni platform in March for former researchers from IMBA, the IMP, the GMI, and the Max Perutz labs. Within months, the platform grew to nearly 1000 members, offering a job board for career opportunities and a mentoring program that matches senior alumni with current researchers and junior alumni for career guidance.

With this latest initiative, students wrestling with what comes next have an additional way to connect with people who have worked through the same uncertainties and built successful careers. These connections across generations are a reminder that the skills built in a PhD program, through training that supports collaboration, extend far beyond the lab. The solitary scientist was always a myth. What the Scientific Training Unit builds, from the first week of a PhD to decades after graduation, is the community that replaces it.

Rull, V. (2026). Does solo publication still make sense? *EMBO Reports 27*, 566–569. https://link.springer.com/article/10.1038/s44319-025-00677-1

Bennett, L. M., & Gadlin, H. (2012). Collaboration and team science: From theory to practice. *Journal of Investigative Medicine, 60*(5), 768–775. https://doi.org/10.2310/jim.0b013e318250871d

Gunnarsson, R., Jonasson, G., & Billhult, A. (2013). The experience of disagreement between students and supervisors in PhD education: A qualitative study. *BMC Medical Education, 13*(1), Article 134. https://doi.org/10.1186/1472-6920-13-134

Hancock, S. (2023). Knowledge or science-based economy? The employment of UK PhD graduates in research roles beyond academia. *Studies in Higher Education, 48*(10), 1523–1537. https://doi.org/10.1080/03075079.2023.2249023

Within months, the VBC Alumni Network grew to nearly 1000 members, offering a job board for career opportunities and a mentoring program that matches senior alumni with current researchers and junior alumni for career guidance.

This story highlights some of the Scientific Training Unit's work. Discover how scientists are recruited and trained at the Vienna BioCenter, from first lab experiences to independent research, and the administrative work that supports this process.

From lab bench to leadership

The Vienna BioCenter trains scientists in the leadership skills they never learned in graduate school.

Team leaders in research institutions spend years training for their scientific role. Leadership itself is rarely part of that training. A 2023 study in the journal *PLOS ONE* found that academics in the biological sciences recognize the gap and are actively looking to close it.

Since 2023, the Vienna BioCenter Leadership Training program has offered a response, bringing together over 45 research group leaders, administrators, and facility managers through a one-year curriculum designed to build understanding and collaboration across the campus, followed by ongoing peer groups where participants continue to practice together long after the formal training ends. The program has trained teams across IMBA, the IMP, GMI, and VBCF, and will reach nearly all group leaders by 2026. The model has drawn wider attention, too: it was recently featured in *Labor Journal*, and is now being replicated at other institutions. Here's what some of the participants have learned.

What it means to lead

For most scientists, the move into leadership happens quickly: one day you are a postdoc, and the next you are responsible for a team. The program starts by asking participants to think carefully about what that responsibility actually means.

Francisco Balzarotti (IMP, 2023): "The best part of leading a team is to help people develop and flourish."

Elly Tanaka (IMBA, 2025): "A great leader empowers and explains, never just prescribes."

Johannes Zuber (IMP, 2024): "Effective leadership is not just about building and guiding a team toward your vision, but about creating an environment that empowers others to innovate and grow into leaders."

The work starts within

Once participants have a clearer picture of what leadership means, the program turns to honest self-assessment, which is not always comfortable but it is the foundation for everything else.

Peter Duchek (IMBA, 2025): "Nothing in leadership makes sense except in the light of communication."

David Haselbach (IMP, 2024): "A better leadership approach combines empathy with evidence-based practical skills."

45+

the number of research group leaders, administrators, and facility managers trained through the Vienna BioCenter Leadership Program since its launch in 2023

Noelia Urbán (IMBA, 2025): "Leadership starts with self-awareness. The training helps us find and strengthen our weak spots."

From insight to action

The test of any training program is what happens when participants return to their labs.

Daniel Gerlich (IMBA, 2024): "Our leadership course has inspired new formats for lab meetings appreciated by all team members."

Robert Heinen (IMP, IMBA, 2025): "This training gives me tools to strengthen our culture and community at the Vienna BioCenter."

Joanna Jachowicz (IMBA, 2024): "I want to inspire my team by applying strategies that foster trust, resilience, and collaboration."

Where better science begins

Together, the participants share a common message, that leadership in science is not about having all the answers, but building the kind of environment where better answers become possible. For anyone who has ever wondered whether their lab culture could be stronger, that's probably a good place to start.

Brown JAL (2023) Profiling leadership: Attitudes, knowledge and training in the biological sciences. *PLOS ONE 18*(6): e0286826. https://doi.org/10.1371/journal.pone.0286826

For an external perspective on how this program is being discussed beyond the Vienna BioCenter, see the *Labor Journal* article (German).

The work behind scientific connections

At the Vienna BioCenter, coffee breaks and careful planning turn chance encounters into fruitful collaborations.

The collaboration that leads to a breakthrough paper often starts with a conversation no one planned. Two researchers meet during a conference break. One mentions a technique. The other describes a problem. They exchange contact information. Fast-forward three years, and they're co-authors.

Those chance encounters shape more than future collaborations. They also improve the research being presented, such as when a question after a talk reveals a methodological gap or a hallway chat suggests a different analysis approach. That refinement process matters: research presented at conferences is more likely to reach publication. A Cochrane Library meta-analysis covering nearly 30,000 abstracts found that roughly 40 percent of conference presentations are published as full journal articles within four to five years, suggesting that conferences offer both visibility and feedback that strengthens work before journal submission.

However, creating the conditions where those unplanned conversations happen requires deliberate effort.

A year of planning for a few days of connection

Planning a conference at the Vienna BioCenter begins a year before anyone arrives. Manuela Steurer, Scientific Secretariat at the IMP, and Lea Klement, Scientific Office at IMBA, invite popular speakers early, book hotel room blocks, and check Vienna's event calendar to avoid scheduling conflicts. They coordinate the on-site organization and keep the scientific organizers on track. Between five and ten conferences are held each year, which means that this entire cycle runs almost constantly.

There is an upper limit to how large conferences can grow before connection breaks down. "I really like the size of around 150 to 200 people because I think this is the max where you can really still have these interactions," Steurer explains. Conferences at the Vienna BioCenter typically maintain that scale.

Recent research suggests why this works. Studies from Northwestern University's Institute on Complex Systems found that small-group interactions at conferences, specifically groups of three to four people, make participants seven to eight times more likely to form future collaborations compared to those who don't have these interactions. But size alone doesn't guarantee those small groups will form. How time is structured during the conference matters just as much.

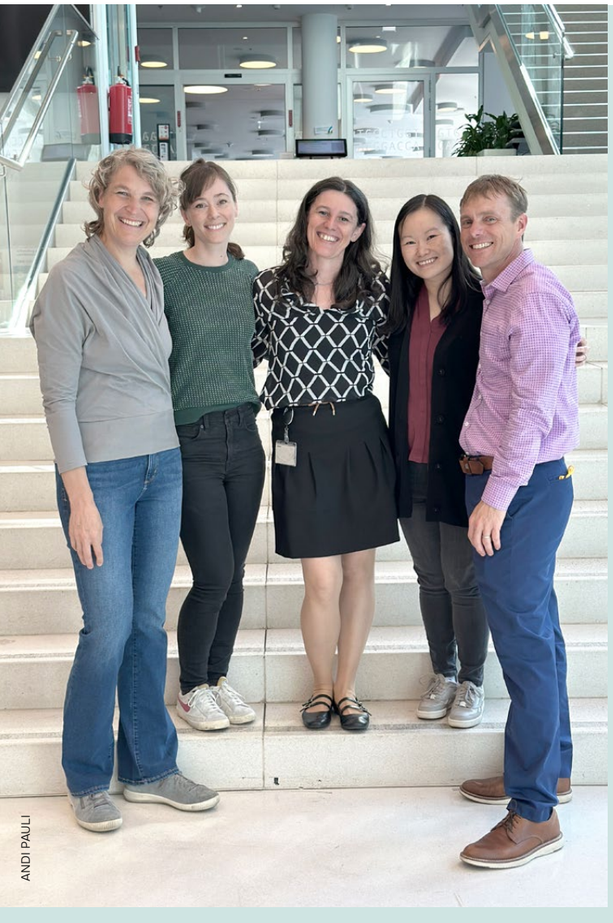
7 to 8 times

the likelihood of forming a future collaboration for conference participants who have a small-group conversation at an event, according to research from Northwestern University

BENEDIKT MANDL

Lea Klement has a leading role in coordinating the SY-Stem Symposium's organizational and administrative work, including speaker invitations, scheduling, logistics, and on site coordination.

> **"I really like the size of around 150 to 200 people because this is the max where you can really still have these interactionse."**
>
> **Manuela Steurer, IMP**



ANDI PAULI

Manuela Steurer (IMP), center, conference organizer of the 2025 EMBO Workshop "RNA meets protein decay" in Vienna, pictured with co-organizers Andi Pauli (IMP), Olivia Rissland (University of Colorado School of Medicine), Susan Shao (Harvard Medical School), and Eric Bennett (University of California San Diego).

The strategic pause

Steurer and Klement structure conference schedules around a simple principle: talk sessions cannot exceed two hours before taking a break. "Coffee breaks are a very important part of conferences," Klement says. The breaks allow time for conversations, questions sparked by presentations, and connections with researchers that attendees might not otherwise approach.

Additional structured opportunities for interaction include evening events, poster sessions, and meet-the-speaker lunch tables that anyone can join, which are particularly effective at breaking down hierarchies. "I think the lunch tables make it easier for students to get to know those big shots where they would normally not talk to them at larger meetings," Steurer explains.

The virtual challenge

After 2020, public health restrictions accelerated the introduction of alternative conference formats around the world, including hybrid events that mixed in-person and online attendance. As restrictions eased, conference organizers in many fields moved away from the hybrid model, and research helps explain why. The same Northwestern study that showed the power of small group interactions also found that virtual conferences work for formal learning but are only about half as effective at community-building compared to in-person networking. Hybrid events fall into an awkward middle ground, serving neither purpose well.

For conferences committed to in-person formats, creating the right environment can sometimes mean leaving the venue entirely. Organizers of such events have incorporated outdoor excursions that include activities like climbing or archery, evening tours of local attractions, or hikes through nearby green spaces. These activities offer informal settings where discussions develop naturally, maximizing the advantages of gathering in person.

A team effort

Making a conference at the Vienna BioCenter look effortless requires approximately 30 people whose efforts are carefully orchestrated. Long before the doors open, the graphics team designs posters and badges while communications promotes speakers and arranges branded merchandise. Facility management sets up the venue and the cafeteria team prepares meals and refreshments for hundreds of participants. Security coordinates building access for evening events and weekend sessions and the reception team welcomes arriving participants. Cleaning staff members ensure lecture halls and common spaces are ready each morning and maintained throughout long conference days while IT stands by to manage screens or troubleshoot technical problems and photographers document highlights. The list goes on.

The on-campus infrastructure allows this coordination to happen smoothly. "You can rely on them so much," Steurer says. "You tell them something and you know it's done." When everything runs smoothly, attendees can focus on the science, the speakers, and the ideas being exchanged without noticing the work that makes it possible. "Without this team, organizing successful meetings would be impossible," Steurer notes. Yet every conference depends on the team's expertise, and benefits from it being passed on.

Learning by organizing

Conference organizing is a skill best learned through practice, and at the Vienna BioCenter, students get that opportunity through hands-on experience. Approximately 90 percent of conference helpers come from the student body, giving many their first exposure to how these events operate. The Vienna BioCenter PhD Symposium takes that learning further. It's an annual student-organized conference where doctoral students coordinate the full scope of conference planning, from speaker invitations to venue logistics to budget management.

Under the heading of this year's 22nd edition, "Bringing it all back home," the symposium brought alumni back to campus for a reunion that combined scientific talks with career exploration. "The fact that the event was organized by students for students made a big difference," notes Patrick Zelger from the Obenauf lab at IMP, one of the organizers. Being in the trenches of PhD life gave the organizing committee an insight into what their peers needed, so they balanced speakers from academia and industry recognizing that many PhD students are still exploring career paths. Formats emphasized interaction and open dialogue over lecture-style sessions. "It created a low-pressure atmosphere where people felt comfortable asking questions, talking to speakers, and interacting with each other," says Zelger.

Together, 11 students coordinated the effort, recruiting 40 helpers and dividing up all the planning and work among themselves. Weekly one-hour meetings started nearly a year before the event, with shared documents tracking responsibilities and deadlines. They also assigned area captains to manage teams for specific domains like registration, technical support, and catering, ensuring each aspect of the conference had clear oversight.

> **"The fact that the event was organized by students for students made a big difference."**
>
> **Patrick Zelger, IMP**

When things go wrong

Logistics at the PhD Symposium also revealed the learning curve that comes with first-time organizing. Welcome bags arrived late, and tracking signups for parallel events became what Zelger calls "a logistical puzzle, solvable but definitely not trivial."

However, experience doesn't eliminate surprises. "You can be sure that, for every single meeting, something new pops up that can go wrong," Steurer says. It has happened repeatedly. From the technical (microphones failing on opening morning), to the dramatic (the Eurovision Song Contest being held in Vienna the same weekend as a planned symposium, blocking every hotel room and forcing a complete date change). "No matter how well you plan, something can always happen," Klement says.

What matters is having the infrastructure to handle it: relationships with teams who can adapt quickly, expertise to know what can be solved and what requires changing course, systems that allow rapid response.

Leaving room for the unexpected

Creating the conditions for scientific collaboration requires more than logistics and careful planning. It also requires staying open to new ideas about how people connect. With this in mind, Klement encourages PhD students and postdocs to shape event programs themselves. They can propose speakers, social activities, or networking activities. "They can focus on the creative and fun elements of the program while I provide the necessary organizational and administrative support," she explains.

The invitation captures the philosophy behind all the work: engineer the conditions, but leave space for the unexpected. Conferences serve many purposes: sharing knowledge, building networks, advancing careers. But the conversation that becomes a collaboration three years later is exactly the kind of moment no one can plan.

> **"They can focus on the creative and fun elements of the program while I provide the necessary organizational and administrative support."**
>
> **Lea Klement, IMBA**

Scherer, R. W., Meerpohl, J. J., Pfeifer, N., Schmucker, C., Schwarzer, G., & von Elm, E. (2018). Full publication of results initially presented in abstracts. *Cochrane Database of Systematic Reviews*, 2018(11). https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.MR000005.pub4/full

Zajdela, E. R., & Abrams, D. M. (2024). Face-to-face or face-to-screen: A quantitative comparison of conference modalities. *PNAS Nexus, 4*(1), Article page 522. https://academic.oup.com/pnasnexus/article/4/1/pgae522/7906554

ANNA STANESCU

Symposium organizers America Ramirez Colmenero, Sebastian Platzer, and Patrick Zelger (IMP) waiting for the opening session on evolution and gene regulation to begin.

Recommended reading

We put out an open call asking the IMBA and IMP communities which papers from outside our labs they couldn't stop thinking about.

The best papers don't just answer a question. They change the question itself. Earlier this year, we asked members of the IMBA and IMP communities to tell us which studies from outside our own labs had an impact on them in 2025. The five they chose range from animal behavior to synthetic biology, from genome evolution to clinical medicine. What unites them is a quality that's hard to name but easy to recognize: the moment where a mechanism that seemed opaque suddenly becomes transparent, and you can see not only how the system works but what you might build with that knowledge. If you haven't read them already, we think they're worth your time over coffee.

A postal code written in protein

In many plants and animals, certain "jumping genes" called centrophilic retrotransposons target the centromere with almost surgical precision. This makes intuitive sense: centromeres are gene-poor regions where a transposon can insert itself without disrupting anything essential. But how do these elements find their way there?

A study of thale cress *(Arabidopsis thaliana),* published in the journal *Nature,* solved this long-standing puzzle by identifying the molecular address they follow. The answer is CENH3, a histone variant found exclusively at centromeres. The researchers showed that the integrase protein of the AtRE1 retrotransposon contains a domain that physically binds to CENH3, using it as a docking site. When the team experimentally tethered CENH3 to non-centromeric locations, the retrotransposons followed it there.

The mechanism is elegant in its simplicity: the genome's own bookmark becomes the landing pad. And the implications go beyond basic biology. If a jumping gene can read a histone postal code to find a safe harbor in the genome, it may eventually be possible to engineer that same logic into gene delivery vectors, directing therapeutic cargo to specific, predictable locations.

Zhu, Q., Zhao, L., Liu, Y., Liu, S., Xu, H., & Zhong, X. (2024). Centrophilic retrotransposon integration via CENH3 chromatin in Arabidopsis. *Nature, 636*(8044), 997–1004. https://doi.org/10.1038/s41586-024-08319-7

When silence is the alarm

Most immune systems work by sensing danger and raising an alarm. A virus arrives, a receptor detects it, and a signaling molecule triggers a defense. A study published in the journal *Nature* revealed a bacterial system that inverts this logic entirely.

In the Panoptes defense system, a miniature CRISPR polymerase called mCpol constantly produces a cyclic signaling molecule, c-di-AMP, during normal cell health. This molecule acts as a repressor, keeping a toxic effector protein in check.

The system is, in effect, always broadcasting an "all clear" signal. The twist comes when a virus invades and, as many viruses do, deploys molecular sponges and enzymes to dismantle the host's signaling. By clearing out c-di-AMP, the virus inadvertently releases the brake on the effector, which destroys the cell's inner membrane and kills both host and invader. The bacterium has rigged its own defense so that the virus's counter-attack is what pulls the trigger.

It is a deadman's switch built from CRISPR components, and it represents a fundamentally different way of thinking about biological detection: not sensing what is there, but sensing what has gone missing.

Doherty, E. E., Adler, B. A., Yoon, P. H., Hsieh, K., Loi, K., Armbruster, E. G., … & Doudna, J. A. (2025). A miniature CRISPR–Cas10 enzyme confers immunity by inhibitory signalling. *Nature, 647*(8091), 997–1004., https://doi.org/10.1038/s41586-025-09569-9

The penguin's commute

Anyone who has watched a penguin on land might assume the ocean is where they come into their own. But even at sea, the physics of getting home is not straightforward.

A study published in the journal *PLOS Biology* tracked Magellanic penguins (Spheniscus magellanicus) returning to their breeding colonies through powerful tidal currents and discovered something unexpected: the penguins weren't fighting the current. Instead, they were using ▸ it. In calm water, they swam in a straight line. In strong lateral tides, they allowed themselves to drift, tracing elegant S-shaped paths back to the colony.

This "drift-and-compensate" strategy turns out to be a remarkably efficient piece of engineering. By surrendering to the current rather than resisting it, the penguins save energy and simultaneously increase their chances of encountering food sources along the way. The tide becomes both a free ride and a mobile buffet.

It is a reminder that sometimes the smartest solution to a hard problem is not to overpower your environment but to read it.

Gunner, R. M., Quintana, F., Tonini, M. H., Holton, M. D., Yoda, K., Crofoot, M. C., & Wilson, R. P. (2025). Penguins exploit tidal currents for efficient navigation and opportunistic foraging. *PLOS Biology, 23*(7), Article e3002981., https://doi.org/10.1371/journal.pbio.3002981

Turning the tumor against itself

For years, certain cancer-driving mutations have been considered "undruggable." Traditional small-molecule inhibitors work by binding to a mutant protein and blocking its activity, but resistance almost inevitably follows. A preprint posted on *bioRxiv* takes a fundamentally different approach.

Instead of trying to inhibit the oncogenic signal, the authors built a synthetic protein circuit that hijacks it. Delivered via mRNA in lipid nanoparticles, the circuit contains a protease-based sensor that detects mutant KRAS activity inside the cell.

Once triggered, an internal amplifier activates "death effectors" that force the cell into programmed suicide. The cancer cell's own mutation becomes the kill switch. In cell lines resistant to existing inhibitors and in aggressive liver cancer models in mice, the system reduced tumor burden significantly.

The logic is striking: rather than silencing the problem, the circuit repurposes it. And because the platform is modular, in principle the sensor can be swapped out to target other mutations, offering a programmable way to go after cancers that have so far stayed one step ahead of the treatment.

Lu, A., Moeller, L., Moore, S., Xia, S., Ho, K., Zhang, E., … & Elowitz, M. B. (2025). Engineered protein circuits for cancer therapy. *bioRxiv.* [Preprint]. https://doi.org/10.1101/2025.04.16.647665

Six months to save a life

The final paper in our list is where the tools meet the patient. It describes the case of an infant born with carbamoyl-phosphate synthetase 1 (CPS1) deficiency, a rare metabolic disorder in which toxic ammonia accumulates in the body. The condition has a 50 percent mortality rate, and there is no approved treatment.

A multi-institutional team did something that has never been done before: they designed a bespoke CRISPR base-editing therapy tailored to this one patient's specific mutation, tested it, secured emergency FDA approval, and delivered it, all within six months. Following two infusions via lipid nanoparticles, the infant showed significant clinical improvement, including normalized protein tolerance and a 50 percent reduction in life-sustaining medications.

The study, published in the *New England Journal of Medicine* is a proof-of-concept for what the authors call "N-of-1" medicine. Thousands of ultra-rare genetic diseases currently lack any pharmaceutical interest because the patient populations are too small. This case suggests a future in which a generalizable platform could produce rapid, individualized genetic therapies on demand.

Everything in the four papers above points toward understanding mechanism and building tools. This is the story of what happens when those tools arrive in time.

Musunuru, K., Grandinette, S. A., Wang, X., Hudson, T. R., Briseno, K., Berry, A. M., … & Urnov, F. D. (2025). Patient-Specific In Vivo Gene Editing to Treat a Rare Genetic Disease. *New England Journal of Medicine, 392*(22), 2235–2243. https://doi.org/10.1056/NEJMoa2504747

Rethinking the experiment

At AITHYRA, the new AI institute at the Vienna BioCenter, researchers in artificial intelligence and the life sciences are working together to generate scientific hypotheses, not just analyze data.

AITHYRA / NATASCHA UNKART

Georg Winter, Scientific Director Life Sciences, Anita Ender, Managing Director, and Michael Bronstein, Scientific Director AI (left to right)

The scientific method has remained fundamentally unchanged since the era of Isaac Newton: researchers generate a hypothesis, use it to make predictions, and then test those predictions experimentally. Technology has certainly transformed how we make and test predictions, with computers running complex simulations and sequencing technologies reading entire genomes. However, hypothesis generation, the creative spark that drives scientific discovery, has always been a purely human endeavor. Until now.

The newly established AITHYRA Research Institute for Biomedical Artificial Intelligence aims to change this by making artificial intelligence an increasingly important partner in the scientific process. Founded in September 2024 with funding from the not-for-profit Boehringer Ingelheim Foundation, AITHYRA is a research institute of the Austrian Academy of Sciences (ÖAW). The institute is designed to combine the best of the academic, corporate, and start-up worlds. It is co-led by Managing Director Anita Ender and two Scientific Directors, Georg Winter for Life Sciences and Michael Bronstein for AI.

Why biology needs a different approach

Traditional computational science is built on the premise that there is at least an approximate model of the system of interest, typically encoded in the form of a mathematical equation. Programming this equation into software allows researchers to solve it on a computer and make predictions. In the biological sciences, however, this premise is often invalid because there is simply no 'equation of a cell.'

Modeling biological systems requires a paradigm shift. Instead of humans explicitly programming algorithms, machine learning systems learn patterns directly from the data itself, allowing neural networks to discover solutions implicitly. AlphaFold, an AI system that predicts protein structures from their amino acid sequences, perfectly demonstrated this approach and earned its developers Demis Hassabis and John M. Jumper the 2024 Nobel Prize in Chemistry.

> **"We need to rethink how experimental data is produced, shifting our focus to generating data explicitly meant to be consumed by machines."**
>
> **Michael Bronstein, AITHYRA**

This breakthrough generated immense enthusiasm, but Bronstein notes that researchers often overlook the trove of data that made AlphaFold possible: the Protein Data Bank (PDB). "It took five decades of effort by thousands of structural biologists, and an estimated cost of up to 50 billion dollars, to build the PDB," he says. "Crucially, this data was never originally conceived to train AI models; it was merely a byproduct of the human scientific inquiry process." To enable similar breakthroughs in other fields of science, Bronstein argues that "we need to rethink how experimental data is produced, shifting our focus to generating data explicitly meant to be consumed by machines."

Designing experiments for machines

Bronstein believes the recent progress in AI makes the life sciences ripe for a paradigm shift. "The breakthrough of AlphaFold came from moving from the 'equation of a protein' approach based on handcrafted inductive biases to 'black box' approaches based on deep neural networks," he says. "A natural continuation of this trend is removing handcrafted human biases from the data generation process."

In recent years, 'black box' data sources have emerged that focus directly on AI consumption. Moving away from trade-offs optimized for human consumption enables significant improvements in throughput and cost. "We can see a clear analogy to the emergence of black box algorithms, giving up human interpretability in favor of scalability optimized for AI," Bronstein explains. "In the most extreme version of this paradigm, new data sets can become completely unintelligible to humans and will make sense only in conjunction with an appropriate AI model."

Bronstein points to cross-linking mass spectrometry as a recent successful example of this approach used in his work. Cross-linking mass spectrometry is an analytical method that chemically links nearby parts of proteins and then measures mass-to-charge ratios to reveal how the proteins are folded or interacting. Unlike most other techniques to obtain protein structures such as electron microscopy, cross-linking mass spectrometry provides only a very coarse proxy structure, but across a whole proteome and at a lower cost. In the past, scientists used this rough information to validate structural data from other methods. Now, AI-driven methods, specifically foundation models equipped with deep learning priors, can use these sparse restraints to dramatically narrow the search space.

Co-designing AI and biology from the start

"Our ambition at AITHYRA is to develop experimental technology and AI methods in tandem, to solve fundamental scientific questions and translate them into tangible impact that could help understand diseases and provide new cures," says Bronstein. AITHYRA is not a computational service facility where researchers send their data for analysis after the fact. "Rather, we are looking for people who share our mindset: experimentalists who take an 'AI-first' approach to their experiments, and computer scientists who want to take their AI models beyond computational predictions and test them experimentally."

> **"We are looking for people who share our mindset: experimentalists who take an 'AI-first' approach to their experiments, and computer scientists who want to take their AI models beyond computational predictions and validate them experimentally."**
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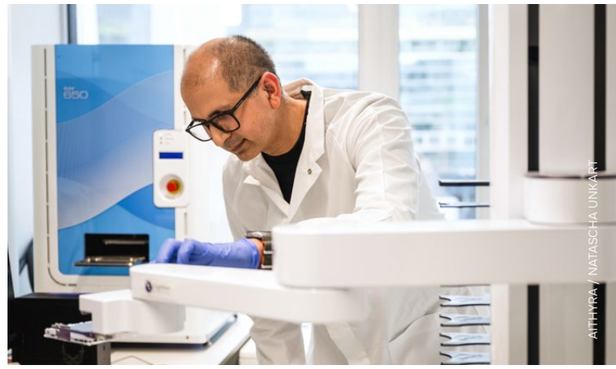
> **Michael Bronstein, AITHYRA**



AITHYRA / NATASCHA UNKART

Wali Malik started as Head of AI-Driven Lab Robotics at AITHYRA in August 2025.

To realize this vision, AITHYRA is investing in building an automated AI-driven lab-in-the-loop where collaborations should begin by defining the biological question and identifying how to match it with a scalable technology that can be implemented on the platform. "We would prioritize research that moves away from descriptive, low-throughput assays and instead can generate the diverse, high-throughput data required for AI models," says Bronstein.

Looking across the research landscape at institutes like IMBA and the IMP, Bronstein sees the biggest potential in 'programmable biology.' This could mean engineering synthetic receptors for immune cells to recognize cancer, or designing protein binders that can rewire tissue microenvironments.

Experiments reimagined

> **"We will continue standing on the shoulders of giants increasingly made of silicon."**
>
> **Michael Bronstein, AITHYRA**

The experiments of tomorrow will not just answer different questions; they will be designed from the ground up. Bronstein believes that, five years from now, a researcher walking through a lab at the Vienna BioCenter will experience a fundamentally different day-to-day workflow. AI will no longer be an isolated analytical step but will act as a ubiquitous 'co-pilot' seamlessly embedded throughout the entire scientific process, from performing literature reviews and generating initial hypotheses, to writing software code, designing automated experiments, and ultimately helping to write and review the resulting papers. "We will continue standing on the shoulders of giants increasingly made of silicon," says Bronstein.

This interview with Michael Bronstein was edited for length. Visit the website to read the full version.

Scientific events of 2025

In 2025, IMBA and the IMP hosted scientific meetings that brought over 1000 researchers from around the world to the Vienna BioCenter to discuss molecular biology, stem cell research, and developmental biology.

Participant numbers are approximate.

SY-Stem Symposium

Date: 12-14 March 2025
Location: Vienna BioCenter, Vienna
Participants: 270

The SY-Stem Symposium fostered interdisciplinary exchange between experimental biologists, clinicians, and computational scientists studying how stem cell systems reveal fundamental principles of human development and disease. Elif Eroglu, 2014 Rabitsch Award recipient and group leader at the Karolinska Institutet, presented her work on heart regeneration in salamanders.

Young Investigator Symposium

Date: 7 April 2025
Location: Online (IMBA / IMP)
Participants: 100

The Young Investigator Symposium provided a platform for early-career researchers to present emerging work across disease, development, AI, gene expression, synthetic biology, and mass spectrometry; share new experimental approaches; and discuss future directions in the life sciences.

19th Microsymposium on RNA Biology

Date: 7-9 May 2025
Location: Vienna BioCenter, Vienna
Participants: 194

At the 19th Microsymposium on RNA Biology, Luisa Cochella, associate professor at Johns Hopkins School of Medicine and adjunct investigator at the IMP, opened the program with a talk on “An essential and ancient miRNA family controls cell interaction pathways in *C. elegans.*”

EMBO Meeting: RNA Meets Protein Decay

Date: 11-14 May 2025
Location: Vienna BioCenter, Vienna
Participants: 120

Presentations at the EMBO meeting “RNA Meets Protein Decay” highlighted how cells coordinate RNA processing, translation, and protein degradation to maintain cellular homeostasis. Lorenz Grundmann (IMP) is seen here presenting his research on HERC1, an enzyme that plays an important role in intracellular signaling, membrane trafficking, and autophagy.

Vienna BioCenter Summer School Fellows Symposium

Date: 29 August 2025
Location: Vienna BioCenter, Vienna
Participants: 80

The Vienna BioCenter Summer School Fellows Symposium highlighted research projects developed by international students participating in the Vienna BioCenter Summer School. Fellows presented work spanning developmental biology, genome regulation, and cell biology, reflecting the range of approaches explored during the program.

Among the presenters were students whose projects we discussed in interviews. Bolaji Ajao (Grade lab) investigated changes in axonal pathways in the striatum to examine whether Huntington’s disease may have a neurodevelopmental component. Aleq Adrianne Andresan (Pauli lab) worked with zebrafish fertilization assays in vivo and with sperm samples in vitro to isolate and study proteins involved in the process. Daniel Paul (Goloborodko lab) used RNA modeling to explore liquid–liquid phase separation and the RNA properties that contribute to it.

Bolaji Ajao, Grade lab, IMBA

Daniel Paul, Goloborodko lab, IMBA

Aleq Adrienne Andresen, Pauli lab, IMP

Austrian Society for Stem Cell Research (ASSCR) Annual Meeting

Date: 25-26 September 2025
Location: Vienna BioCenter, Vienna
Participants: 110

The annual meeting of the Austrian Society for Stem Cell Research featured presentations on the latest findings in stem cells, organoids, and regenerative biology.

40 Years of Finding Out Symposium

Date: 5 November 2025
Location: Vienna BioCenter, Vienna
Participants: 300

The symposium "40 Years of Finding Out" celebrated decades of scientific discovery at the Vienna BioCenter and highlighted research shaping the future of molecular and biomedical science. Michael Bronstein, Scientific Director of AITHYRA, quoted "Faust" in his keynote talk at the IMP's 40 year anniversary symposium to illustrate a central shortcoming of biology: "Who would describe and study living things; seeks first the spirit thence to banish; Then has the parts within his hand, Lacks, unfortunately, only the spiritual band." See the 2025 IMP Research Report for comprehensive coverage.

22nd Vienna BioCenter PhD Symposium – Bringing it all back home

Date: 5-7 November 2025
Location: Vienna BioCenter, Vienna
Participants: 300

At the 22nd Vienna BioCenter PhD Symposium, a conference organized by PhD students, early-career researchers exchanged ideas across molecular biology, genetics, and computational biology. Max Kellner received a Vienna BioCenter PhD Award for his thesis, in which he developed bat-derived organoids to investigate why bats can carry highly pathogenic viruses without becoming ill. More: https://imba.science/4r5X0TE.

Explore this year's events at IMBA and the IMP.

COMMUNITY NOTE

Retirements in 2025

Please join in celebrating six colleagues whose combined service to the institutes totals 162 years. They worked across services and research, and we thank them for their contribution to the institutes and wish them well in the years ahead.

Tibor Kulcsar, Graphics, 20 years
Werner Leitner, Human Resources, 27 years
Gabriele Litos, Peters lab, 28 years
Andreas Riepl, IT, 37 years
Sabine Steurer, Human Resources, 18 years
Christian Theußl, Transgenic facility, 32 years

Read the Scene

The Amateur Drama Club, usually centered on dialogue, demonstrates what becomes visible when words are removed.

Laboratories and theaters both change how people behave. In a lab coat, we stand and move one way. In a costume, we stand and move another. Under a microscope, gestures become small and precise. In a spotlight, they become larger and more expressive.

Scientists train for years to communicate clearly with words. But meaning also comes from context: the space someone is in, what they wear, what they hold, and how they move. To explore this without words, we asked the Amateur Dramatic Club to show us.

For this feature, club members demonstrate how they use gesture and movement to tell stories, all without words. Choose the phrase that best describes what you see from the list provided. Look for visual cues in costume, props, posture, and the progression across frames.

Find the answers online and explore life at the Vienna BioCenter, where nearly 20 campus sports, clubs, and shared activities help turn colleagues into a community.

Match each scene to the correct phrase:

ADAM COOPER

1

2

3

4

Answer Choices

- **A** Failed Experiment
- **B** Collaboration
- **C** Transformation
- **D** Peer Review Panic
- **E** Getting into Character
- **F** Community Party
- **G** Differentiation
- **H** Balance

Science takes the stage

Since 2008, the Vienna BioCenter Amateur Dramatic Club has staged more than 40 productions on campus, from Shakespeare classics to science-themed parodies that reimagine beloved stories through a research lens. How many of these have you attended?

Marc Javin (MPL Alumnus) as Caesar and Alba Sanz de Lara Gil (IMBA) as Cleopatra in the 2025 Christmas play Mastermix and Möbelix: Mission Nobel Prize, a science-themed take on the beloved Asterix comics.

A selection of ADC's best stage performances

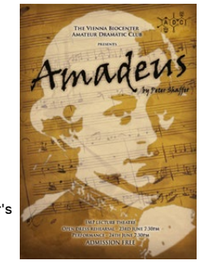
2008

Cinderella

2009

Wizard of Ös

2010



Amadeus

A Midsummer's Dream

Peter Pan

2011

Twelfth Night

A Christmas Carol

2012

Anarchy! A Night of Improvisational Theater

Insufficiency

As You Like It

Aladdin

2013

Kaleidoscope

Romeo and Juliet

Snow White

2014

The Importance of Being Earnest

Hansel & Gretel

2015

A VBC Vaudeville

Charlie and the Chocolate Factory: A Tale of Bittersweet Science

2016

Journey to the Center of the Earth

STAR WARS—Verily, a New Hope

Alice's Experiments in Wonderland

2017

Life, Death, and Everything in Between

The Crucible

La La Lab

2018

Sherlock Holmes—A Drama in Four Acts

Animal Farm

The Rocky Horror Show—an Undiluted ADC 10th Anniversary Special

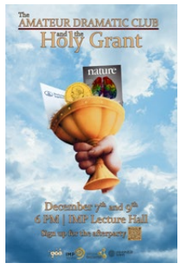
2019

Home Sweet Home:
an Evening of Dark Comedies

Game of Tiaras

The Lab King

2022



Harry Potter and the Doctor of Philosophy

Romeo and Juliet VS The Room

The Holy Grant

2023

Poe's Little Nightmares

Cyrano de Bergerac

Glabbiator

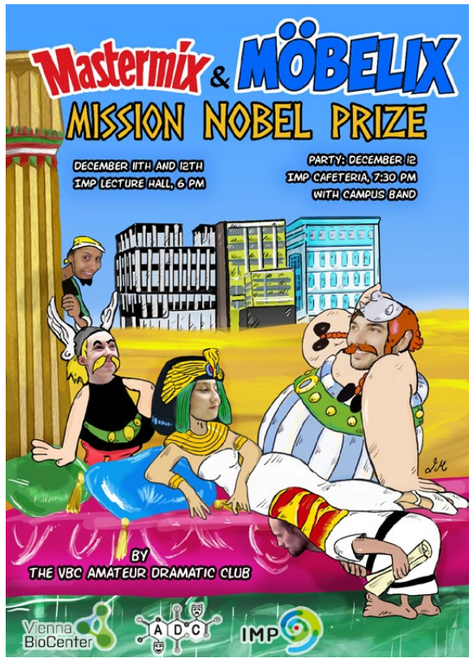
2024

A Murder Mystery

Treasure Island

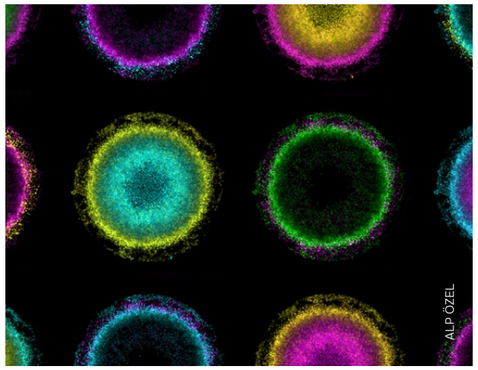
The Lord of the Plasmids

2025

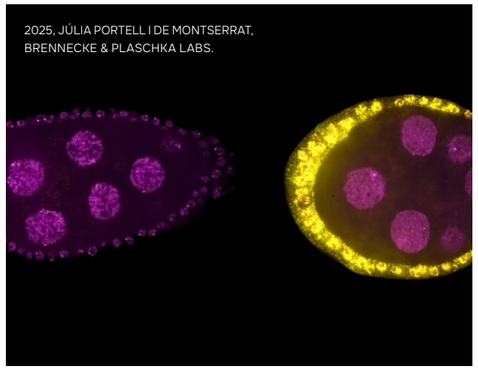


Shrekspeare—the Tragedy of Shrek, Prince of Far, Far Away

Mastermix and Möbelix—Mission Nobel Prize



Warhol gastruloid: A stem cell-based model for human gastrulation depicted in different colours. The confinement to circular micro-patterns results in the emergence of cell fate markers in concentric rings (SOX2, BRA, CDX2 from inside to outside).



Transposon expression (yellow) is silenced by PIWI in *Drosophila melanogaster* ovaries (left), but activates in the absence of PIWI and its partners (right).

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