



ANIMALS AND MONEY

This part of BioS Reports unravels relationships between animals and the economy.

The Resurgence of Scabies -

A Growing Healthcare Burden in Germany

Alina Wahlbuhl

Throughout history, infectious diseases have shaped humankind. Technological and medical advances in recent centuries have greatly reduced their impact in industrialized countries and many diseases have become rare. But what happens when these diseases reappear? One such disease that has seen a great resurgence in recent years is scabies. The infection is caused by the parasitic mite *Sarcoptes scabiei*. The mites burrow into the skin's outer layer, where females lay their eggs [1]. An inflammatory response is triggered in the skin, leading to intense itching and skin irritation [2]. Scabies spreads mainly through close skin contact, but also seems to be transmissible via contaminated bedding [3] or, less likely, clothing [4]. High outbreak risks exist in poor and overcrowded settings like nursing homes, prisons, or refugee camps [5]. The misconception that scabies is caused by poor hygiene leads to stigma, misdiagnosis, and delayed treatment. Additionally, symptoms are often mistaken for other skin conditions [1], allowing further progression and spread. If left untreated, scabies can lead to severe and even life-threatening complications [6].

Scabies affects over 200 million people worldwide [7], with tropical countries being particularly affected [8]. Although rarely occurring in industrialized countries, cases have increased in recent years. In Germany, the numbers shot up from 99,000 in 2014 to around 382,000 in 2018 [9]. The rising incidence leads to an increasing burden on the healthcare system. A general doctor's visit in Germany typically costs €30-70 [10]. In regard to scabies cases, this results in costs of around €3-7 million in 2014 and €11.5 - 27 million in 2018 for health insurers. Further costs may result from treatment and secondary illnesses or reduced productivity due to the symptoms [11]. Scabies outbreaks can also require quarantines, causing economic losses for insurers, employers, and the state. At an individual level, the financial impact can be illustrated with a realistic example: A family man gets infected with scabies - the father, mother, and two children all need treatment with cream. The father's treatment is covered by health insurance, costing €5 per tube [12]. He requires two tubes due to his height. For contact persons, it is not always possible to claim reimbursement for prophylactic treatment [13]. Therefore, in the worst-case scenario, the other family members must fund their treatment themselves, priced at approximately €20 per tube [14]. A second round of treatment is required a week later, resulting in total treatment costs of €140 for a single infection in one family.

Clearly, the impact of scabies extends beyond individual suffering, influencing the economy, productivity, and public health. Better containment can be achieved with mass drug administration [15], public health education, and improved healthcare access. Community-wide treatment has shown promising results [16], whereas improper use of scabicides may increase drug resistance [17]. Ongoing research into new medications and drug resistance, as well as addressing socio-economic factors such as overcrowding and limited healthcare access, are essential [5]. Applying these measures, especially on a global level, is crucial for effective control. If ignored, scabies and other previously controlled diseases will continue to re-emerge, challenging public health security in an increasingly interconnected world.



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EXCURSIONS AND OTHER NEWS

Small insights in BioS points of view, field trips, and other stuff we do.

Science and Peace Take the Stage in Dresden's Frauenkirche

Philine Lea Hampe

Dresden's Frauenkirche might not be the typical venue for a Science Slam, but on November 14th, its sacred quiet met the soft buzz of anticipation. Visitors whispered about the church's ongoing art installation, its blinking light transmitting the Morse-code message "*We shall overcome*" [1]. Moderator Simon Hauser opened the evening by explaining the artwork, using it as a fitting hook for an event devoted entirely to peace.

A serious mood was set when the first slammer, Dominik Steiger, began with the ambitious question: "How is world peace possible?" Talking about recent world events, he challenged the logic of "wars for peace", as well as arguing that self-defense must remain proportional. His reflections gained emotional weight when musician Thabet Azzawi performed his haunting lullaby "*Names on Limbs*", drawing the audience into a deep silence. A shift in tone followed when Jonas Elpelt suggested that reconciliation after conflict is essentially an act of forgetting. His talk brought the audience into the field of neuroscience, including the way our brains create associations based on context. By joking that the color orange could call to mind either a citrus soda or a certain president, he broke the ice for the rest of the evening. With an unexpected turn, the conversation shifted from geopolitics to something as ordinary as the air we breathe. Opening with a snide remark that Dresden's air quality beats Leipzig's, Hani Harb emphasized clean air as a measurable form of peace, and unequal exposure to pollution as a largely unspoken injustice. This widening perspective on peace's social and environmental dimensions continued with Alavy Kifait Reza. She argued that consumer choices, especially in fashion, form part of a broader moral fabric: "Peace with our planet, our choices, woven from the threads we wear."

The evening's winner, Neelakshi Joshi, discussed climate research in an age of rising right-wing populism, linking global crises to local debates in Dresden. Using the example of the Carola bridge and its rebuilding, she demonstrated the ongoing fight between facts and worldviews as well as between the past and a better future. Her core message, both literal and metaphorical, urged for building "bridges between today and tomorrow" - in city planning and in society.



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SCIENCE UNPACKED - THE BIOS PODCAST

Philine Lea Hampe, Hana Abdeljalil & Marit Scheuringer

Feeling hormonal? In this month's episode we speak with Dr. Annekathrin Keiler and Prof. Oliver Zierau about hormones, doping and their relevance to today's society.

In a second, sports-focused episode, Patience, Doyeon and Marit gather the evidence behind the justification of testosterone testing of female athletes in international sports.

EXCURSIONS AND OTHER NEWS

The iGEM Experience - Taking a Look Behind the Scenes

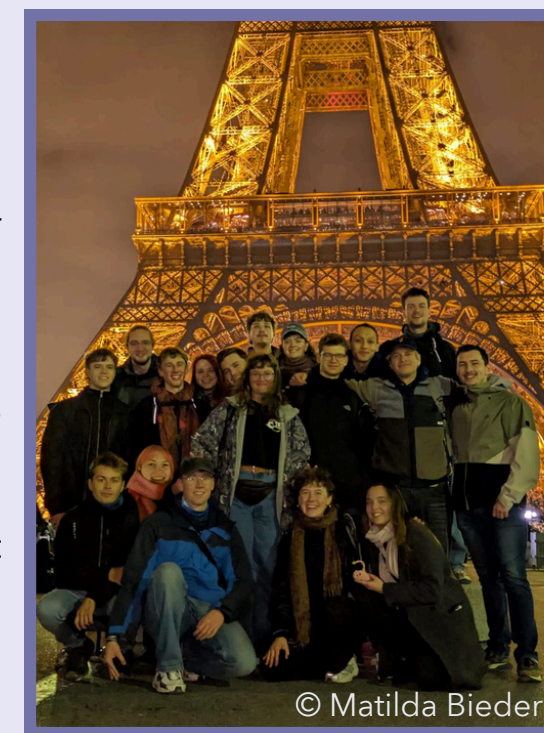
Simon Schäfer

TUD's iGEM team won gold! The grand finale of this year's iGEM competition - effectively the students' Olympics of synthetic biology - took place at the end of October in Paris. At this international stage, the group of 18 TUD students impressed the judges with their project called TRAPS. Short for "Targeted RNA Activated Phase Separation", TRAPS is a method for easier RNA imaging *in vivo*. The technique makes use of biological condensates, which are detectable via fluorescent microscopy in case the targeted RNA is present. That's pretty helpful, since common RNA detection methods are quite laborious, less efficient in detecting low RNA levels and don't work *in vivo*.

As one can imagine, executing such an ambitious project requires a lot of work. Where do you even begin when there are countless research directions but you have to choose just one? The iGEM team quickly decided to focus on biological condensates due to the already well established research in Dresden. Starting in December 2024, the students worked 11 months on the initiative, consisting of weekly meetings and individual work hours of up to 30 h a week solely for the project - not bad! Managing studies, mini-jobs or just private life on top of everything was definitely a challenge. And if that wasn't enough already, finances turned out to be another big test. "In the beginning the funding was definitely a hurdle that seemed hard to jump. Apparently no one has money and there is this principle of 'everyone for themselves' in Saxony right now. But in the end we used some metaphorical leg muscle and literal determination and took that leap [by contacting dozens of sponsors]. Successfully!", Doro, a member of the orga team, told us. Once funding was sorted, it was the students' job to come up with a master plan for their research project that meets the expectations of the iGEM judges.

Fighting through handbooks and instructions required further commitment but the TRAPS team managed to work this out, too. Along with all these obstacles, the students learned a lot and secured a valuable set of skills. Beyond gaining profound expertise in western blots, the project also enabled them to grow personally and build up confidence as young scientists. Celina, who worked in the lab team, recalled: "During the project, we had the opportunity to engage with renowned scientists and high ranking professors in the field. Initially, as a Bachelor's student, I often felt small in comparison, but the discussions were conducted on an equal footing. This made me realize that even as an early-career researcher, I was able to make an impact." October drew closer and the project was nearing its end. Together with more than 400 other teams from over 50 countries, the TUD students attended the final iGEM Jamboree in Paris. Now the time has come to present all the work and collected knowledge from the last 11 months to the judges and other participants. The students had their own booth within the Jamboree, showcasing their project with posters, games and talking to other attendees. Still, there was enough time to explore the festival area, get to know other projects and make new friends. In a final live stage talk and judging session, the team presented their work on condensates. Their achievement left the judges impressed and the TRAPS project was awarded with a gold medal - Congratulations!

Back in Dresden, plans are in the making to proceed with the research: "The project does not stop here! At least two team members are going to continue working on the project in their Bachelor's and Master's thesis", said Celina. Got curious to participate in an iGEM project yourself? All TRAPS members we asked said they'd absolutely recommend taking part - just be prepared to dive into a demanding but highly rewarding experience.



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