



EXCURSIONS AND OTHER NEWS

Small insights in student's or professor's points of view, field trips, and other stuff we do.

Gold in Paris! TUD's iGEM Team Triumphs at 2024 Grand Jamboree with ReFiBa Project

Layanne Abu-Bader

After one year of hard work, the iGEM team of the TUD has finally gone to Paris for the 2024 iGEM Grand Jamboree! The team, composed of 18 students, 8 of which from Biology in Society, presented their ReFiBa project as a part of the Fashion and Cosmetics Village of the Jamboree. They had a successful experience at the Jamboree, and in addition to winning gold for their outstanding work, they were also nominated for best team in their category,



as well as best composite part. You can read more about their innovative ReFiBa project in [Issue 26](#) of BioS Reports. We asked Gabriel Pinto and Aaron Anselmi, two BioS students and members of the iGEM team, about their experience with iGEM.

Why did you join the iGEM team?

Gabriel - I really wanted to spend some time during my Master's working on any kind of multidisciplinary project so I could learn new stuff from other people who were not strictly biologists.

Aaron - We had a great practical course with Marko Brankatschk, and at the end he was enthusiastic about our work. He asked us if we want to do something with our potential, and so I asked him and the group if they were interested in starting an iGEM project. They all agreed on joining and that's basically how the journey began.

What was your favorite part of being on the iGEM team?

Gabriel - Building a large-scale project: we were not only a lab focused team, but we also had to deal with things related to funding, science communication, project management and even web design.

Aaron - Definitely the experience as an actual group leader and the search for funding for this whole project. It was awesome practice to solve problems, giving people tasks which they are most suitable for and using my networking skills.

What did you find the most challenging?

Gabriel - Trying to move things forward both in an effective and efficient way.

Aaron - If I had to pick something, it would be the coordination. As a team leader, I needed to know what's happening everywhere and I needed to make sure my team was doing fine. Sharpening my diplomatic skills was a challenge in the beginning.

Would you encourage other students to join iGEM?

Gabriel - YES. But take into consideration that it is a lot of work and you need to rely a lot on other people. People tend to get stressed leading to tense discussions, so you really need to come with a lot of patience and a positive attitude.

Aaron - Definitely, and I'm already doing that! You won't get a better view into actual project development and fulfilment, which is something you have to do later if you are aiming for a Ph.D. or a group leader position. Besides that, you will learn about how to talk to officials, fill out forms, keep deadlines, and speak in front of hundreds of people from all different backgrounds. During this project you learn so much for life which you don't want to miss. That is of course if you have the time, money and capacity for it.

ANIMALS AND MONEY

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

Sniffing to Save Money: Dogs' Potential in Lung Cancer Screening

Simon Schäfer

Being greeted by a Labrador wagging its tail as one walks into the doctor's office - could this be the future of lung cancer screening? In 2022, lung cancer was the most common cancer type, as well as the deadliest one with 1.8 million deaths globally [1]. Since it is harder to cure late-stage lung cancer, early detection of this disease is fundamental to improve survival rates [2]. However, available screening methods, such as low-dose computer tomography (LDCT), involve high expenses and other disadvantages, such as the negative impact of radiation [3]. A possible alternative screening method could be realized with the help of dogs. Dogs have an extremely good sense of smell, due to a high density of olfactory receptor cells and neurons, nasal airflow modifications and a relatively large olfactory bulb. This enables humans to train dogs to smell the scent of explosives, drugs or wanted criminals [4]. Dogs can even be trained to detect diseases, such as diabetes, COVID-19 or cancer, based on the distinct volatile organic compounds (VOCs) people emit. The composition and concentration of the VOCs change with the progression of cancer and therefore can act as a biomarker that can be detected in a non-invasive way [5]. This method has been suggested to be more economical than traditional screening methods [3]. However, exact numbers seem to be missing. Below, I will compare the expenses for a cancer detection dog with the LDCT method.

To estimate the expenses for a cancer detection dog, I used information based on the costs of diabetes alert dogs and COVID diagnosis dogs. One-time costs, such as acquisition of the dog and specialized training amount to \$8,897 USD [8]. Daily screening costs of using dogs to detect lung cancer are estimated at \$79 USD/ day [9]. The running costs for housing and administrative tasks add \$35 USD/ day (based on fees for dog boarding). Food, insurance and veterinary care add \$1,332 USD annually and costs for maintaining the dog's training over time add another \$88 USD annually [8,10]. Assuming that a dog is used for cancer detection five days a week for five years, a total of \$182,879 USD would be spent, or \$140 USD per day. Alternative scenarios, where a dog would be used five days a week for only two years, or three days a week for two years, arrive at \$232 USD or \$333 USD per day. Cancer detection dogs are, on average, used for testing five samples per session [11,12,13,14]. Therefore, if dogs were used instead of LDCT (price per screening: \$1,130 USD [7]) for five screenings per day, \$5,317 USD - \$5,510 USD/ day could be saved, depending on the time scenario the dog is used. For an entire five-years period of the dogs' service, a total amount of \$1,7 million USD - 7,2 million USD could be saved compared to LDCT screening.

However, the calculations are limited and don't include costs for e.g. standardized dog training, building facilities or extra costs resulting from false diagnosis. Regarding the success rate of dogs in detecting the presence of lung cancer on the basis of breath samples, a mean sensitivity of 78 % and mean specificity of 71.5 % in published studies were found [3]. Also, the range was large: for sensitivity between 55.6 % and 99%, for specificity between 8.3% and 99 % [14,15]. Contrary, LDCT shows high accuracy with a sensitivity of 87 % and specificity of 97 % [17]. These numbers indicate that detection dogs in lung cancer screening are not fully realizable yet. Therefore, research should aim for standardized dog training methods and further identification of VOCs related to lung cancer [5,16]. Still, the calculations show that dogs hold great potential as an alternative and affordable screening method for lung cancer. Introducing these service dogs to healthcare would allow more economically disadvantaged people and low-income countries to have access to lung cancer screening, ultimately saving more lives.

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Introductory Week Excursion for New Students of Biology in Society

Ezgi Ece Yavuz

The new BioS students met on 14 October at the youth hostel in Bad Schandau for their welcome week event. After checking in at the hostel, they got information about their new master's program and a warm welcome from Prof. Reinhardt and Prof. Zierau before it was time to start with their first seminar, as usual on Good Scientific Practice.

Within these four days, we got the opportunity to get to know some very important topics: legal aspects of biology, bioethics, and an introduction to science communication. While talking about the philosophy of how to be a good scientist, we also had workshops on how to present ourselves professionally and academically. Moreover, we were lucky to hear several guest speakers who shared their highly diverse research paths and personal academic histories. These lectures have indeed been a source of inspiration for various scientific careers, such as Oncomechanics, Developmental Biology or Lipidomics.

Besides the academic sessions, we had time to hike up the Schrammsteine, which was an opportunity to get to know the fellow students in the beautiful autumn landscape. We spent time outdoors, observing the changing colours of the forest, spotting mushrooms, and exploring the natural beauty of Bad Schandau. This excursion served both as an educational field trip and a fun way to connect with nature.

Professor Zierau organized a pub quiz as a highlight for the last evening. Some of us went mushrooming on Friday afternoon, others took the train back to Dresden to start their new semester at TU Dresden on Monday.

Although I started my Master's programme last year, I had the opportunity to take part in this year's welcome event since I missed it last year. I enjoyed sharing experiences on BioS with the new students and found that the get-away week has been scientifically enriching and encouraging. It was an experience I had been looking forward to!

