



BioS Reports

Glimpse into the activities of the
Master's course "Biology in Society"

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**2 Year
Anniversary
Edition!**



EXCURSIONS AND OTHER NEWS

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

One Biology In Society, Many Thesis Topics

Nele Kheim and Helen Rothfuß

Here we list the Master's Thesis topics of all students who have finished Biology in Society and received their Master's degree. Even though we spent months in the same lectures and seminars, chosen topics and research fields differ a lot. We also asked some of the students to write one sentence that summarizes their findings.

Clubroot susceptibility of brassicas after treatment with plant strengtheners: None of the different fungus containing seed coatings could improve clubroot symptoms and also the tested plant strengthener did not protect the plant considerably against clubroot.

Co-cultures of Human Endothelial Cells and Human Osteoblasts

Three-dimensional reconstruction and quantitative analysis of monopolar spindles in RPE-1 cells: With the help of electron tomography, I found how inhibiting the motor protein kinesin-5 affects the structure of mitotic spindles in human RPE-1 cells, leading to a monopolar spindle arrangement with two centrosomes in the center, surrounded by microtubules and chromosomes.

Biomedical Applications of Surface Acoustic Wave-Based Acoustofluidics: White blood cells can be influenced using SAW based microfluidics for later usage in leukemia diagnostics but improvement of the technology is still necessary before it can be transferred to a real world application.

Comparative Analysis of UCP1 Functionality in Vicugna pacos and Camelus ferus: Insights into Adaptive Thermogenesis: The functionality of UCP1, a protein important for thermogenesis, is extremely different between the closely related species Vicugna pacos (alpaca) and Camelus ferus (wild Bactrian camel).

Metabolomic Analysis on Periodontal Samples from the Biofluids Saliva, Gingival Crevicular Fluid (GCF) and Dental Plaque: It was determined that in the saliva samples, dental plaque samples and GCF samples collected from periodontitis patients, the metabolome analysis can be performed successfully.

Development and validation of an alternative erythropoietin immunopurification method from urine

Generation, analysis and evaluation of glypican-3 directed antibodies as theranostics for addressing hepatocellular carcinoma: Modified, GPC3-addressing antibodies are very target specific and have a limited blood circulation time which makes them a promising option for both diagnosing and treating liver cancer (HCC).

EXCURSIONS AND OTHER NEWS

And The Deutschland Stipendium Science Slam Winner Is...

Jana Skrobanek

On the 16th of April, I gave a Science Slam talk at the Deutschland stipendium scholarship ceremony. It was a thrilling experience, and I was quite nervous before the Slam. But saying the first words made all of this tension disappear, and it was fun to present my topic in front of the audience.

My topic, "About the Nile tilapia sperm," was based on my Bachelor thesis and covered the topic of spermatogenesis control via microRNA which I tested using primary cell cultures. Because I had the generous time of 7 minutes to explain all of this to a non-biological audience, I had to simplify the contents a lot. Here the science communication skills I learned in BioS came in handy! I drew all the illustrations myself to get simplified versions that I couldn't find anywhere else to help explain the biological processes. A Science Slam doesn't have to be funny, but it should be entertaining. Each audience is specific, so you don't always know how entertaining your talk is until the moment that you are doing it. And apparently I did well, because I won first place together with a student from the physics faculty.

It was a very enriching experience. Usually, we explain our science to people in our field, so I learned a lot about communication by explaining my research to non-biologists. If you ever have the opportunity to do a science slam, take it! It's a great possibility to talk about science while having a lot of fun. As a bonus, you can invest the prize money in a new stack of books!

EXCURSIONS AND OTHER NEWS

Bios Reports Is Growing Even More!

Simon Schäfer and Sophie Merz

Simon recently moved from Freiburg to Dresden to be part of the Master's program Biology in Society. Being fascinated with biology, he wants other people - especially those without a biology-background - to encounter all these thrilling facts and stories about nature. That's what drives him to do science communication. One of his favourite biology fun facts (or rather sad fact): There are parasitic isopods, that eat their host fish's tongue and stay there as the new tongue - scary! Apart from biology, Simon loves being outside. A hike in Saxon Switzerland or going for a bikepacking trip? Count him in!

Choosing her master's program was an easy decision for Sophie. The opportunity to not only be in the lab but also do science communication was tempting. The aspect of educating and entertaining people and giving them the same passion for scientifically relevant topics as she has, made her join the BioS Reports team. Sophie refers to herself as a 'grandma' because she has the same hobbies: knitting, crocheting, solving sudoku and going outside for a little walk. If you catch her on the campus say hello and have a chat, it's always welcome!

EXCURSIONS AND OTHER NEWS

You Ask We Explain - Podcast on Innovations and Inspirations

Marit Scheuringer

In February, my friend Florian Salomon surprised me with a message. "Do you want to host a podcast?" Apparently, a team from the Faculty of Medicine at TU Dresden was looking for a science student for a podcast about bridging the gap between science and society. In the following weeks Florian and I started discussing and preparing questions. How close is science to our society? Can citizens help shape research? How can research and science remain accessible?

We later learned that the podcast was to be recorded with a live audience at the SPIN2030 Science Festival in the Technische Sammlung Dresden. With this new information, my nerves naturally began to get the better of me. Luckily, Stephan Wiegand and Doreen Pretze, the organizers of the podcast, arranged a few sessions in a real radio station. There we got to practice our ideas and get used to having microphones just two centimeters in front of our faces.

After some trial and error, we were ready to host the 15th episode of the "You Ask We Explain" podcast series. The guests were Sebastian Gemkow, the Minister of Science for Saxony, Dr. Tim Hentschel, Managing Director at the Barkhausen Institute and Dorit Teichmann, Startup Manager for life science at Saxocell.

Saxony is a land of science, as stated by Minister Sebastian Gemkow, who advocates for elevating Saxony's potential onto the global stage. Science communication is his preferred tool to spotlight regional research and promote synergies between academia and industry. Fostering dialogue across diverse domains—from science and technology to media and healthcare—paves the way for interdisciplinary collaborations that catalyze innovation and propel regional economies forward. New legal frameworks are built to make combining private investments and public funds to fund research long term. Science serves to solve social problems. Therefore, it is necessary to engage the public in this process, as funding is always tied to risks.

The internet of things entails, as Tim Hentschel elaborated, that all our life - cars, heart monitors, everything - will be connected to each other. His research focuses on data safety in a world of artificial intelligence and other technological innovations. Scientists have the responsibility to take into account the downsides of innovations and keep us safe. In the Barkhausen Institute all scientists share the responsibility to take the time and communicate what they are doing, to other researchers, investors and the public. But how to find new scientists? Fantastic new minds can be discovered; curious young minds can be awakened in events like the Dresden Science night or the COSMOS Science forum.

What are living drugs? They are not leaches or maggots, as one might think, but cells and genes, from our own bodies to find new therapies. Dorit Teichmann is part of the research cluster Saxocell, which is working to connect research and industry in biotechnology and medicine. Even though clusters and collaborations exist, research remains hard and time-consuming work, where many people need to work together efficiently. For a future drug to get from the lab to the bedside it can take a decade or longer. Dorit Teichmann's advice to not lose sight of the goal is to eat it like one would an elephant. Cutting a project into slices and smaller projects helps to not despair and to keep the energy up. Finally, what advice does the trio give to young, aspiring scientists? Be open, look forward with enthusiasm and most of all remain patient.





QUIZ QUESTIONS FROM 23 ISSUES!

BioS Reports is turning 2! For the 24th issue we collected 24 quiz questions from all our previously published issues. From Angora Rabbit to Prof. Zierau - there is a lot to learn (again).

Sometimes you have to think of an answer yourself, sometimes more than one of the suggested answers is correct. You can find the solutions on the last page. Have fun with our little recap!

1. What advice did Nobel Prize winner Sir Gregory Winter give to BioS students? [Issue 1] "Whatever you do in research, ..."

- a) "...it should be important."
- b) "...it should be profitable."
- c) "...it should be easy."

2. What animal product is very profitable for the Indonesian economy? [Issue 1]

- a) Horn of the Javan rhinoceros
- b) Venom milked from king cobras
- c) Coffee beans excreted by civets

3. What effect does soy intake have on male fertility? [Issue 2]

- a) Soy intake significantly increases male fertility
- b) Soy intake has hardly any relevant effect on male fertility
- c) Soy intake can lead to infertility in males



4. What promising effect of Vitamin D was examined in several studies? [Issue 3]

- a) Anticancerogenic effect
- b) Improvement of cardiovascular health
- c) Positive effect on treatment of dementia

5. By eating sea urchins, sea otters help maintain big areas of kelp, which store a lot of carbon dioxide. How much carbon could be saved with the sea otter's service? [Issue 4]

- a) 18.5 mio - 20.2 mio tons (= US\$421 mio - \$553 mio)
- b) 0.5 mio - 1.6 mio tons (= US\$20 mio - \$137 mio)
- c) 4.4 mio - 8.7 mio tons (= US\$205 mio - \$408 mio)



6. Is there a correlation between cannabis use and later use of harder drugs? [Issue 6]

- a) Yes, cannabis has a stronger gateway effect than other legal drugs
- b) Yes, even when confounding factors like mental illness or demographic factors are considered in the studies
- c) Yes, however drug use in general including other legal drugs correlate with the later use of harder drugs
- d) No, just let me smoke weed, I swear I'll never do heroin

7. With the Common Agricultural Policy (CAP) the EU supports agriculture in Europe. Those subsidies also reach the bullfighting sector, where fighting bulls are raised. How much EU CAP money went into the bullfighting sector in 2013? [Issue 6]

- a) 130 mio €
- b) 70 mio €
- c) 15 mio €



8. The European eel has a complicated lifecycle. Farming mostly relies on catching eels in their early "glass eel" stage, when they are still small. How many glass eel individuals make up 1 kg of catch? [Issue 7]

- a) ~870
- b) ~3500
- c) ~5400

9. The European eel is a popular edible fish and an endangered species. To save the species the trade is restricted. People still eat a lot of eel, and an illegal market has formed. [Issue 7] According to calculations the illegal trade with eels is...

- a) The same size as the legal market
- b) Three times the legal market
- c) Ten times the legal market

10. Eurasian Jays bury acorns as an all-year food supply. The birds forget 60% of them, which can become new oak trees. Jays are very important for oak rejuvenation in European forests. How many acorns can one bird hide per year? [Issue 7]

- a) 3600
- b) 7800
- c) 11000
- d) 50000



11. What is Prof. Zierau's favourite biology-related book? [Issue 8]

- a) Full House: The Spread of Excellence from Plato to Darwin by Stephen Jay Gould.
- b) The third chimpanzee by Jared Diamond
- c) The book of hope by Jane Goodall

12. To study health benefits of cold showers, scientists asked people to have a daily cold shower for a month. What were the results? (Compared to people who did not shower cold) [Issue 9]

- a) Participants took less sick days off work
- b) Participants had less days where they felt ill
- c) Participants felt more energized

13. In 2020, a TikTok trend caused a shortage of Elotrans, an electrolyte mixture and diarrhoea medication. It was said that taking electrolytes can prevent hangover symptoms. But which of the following claims are true? [Issue 10]

- a) Electrolyte loss is generally the cause of hangover symptoms
- b) Drinking alcohol causes electrolyte loss in alcoholics and non-alcoholics alike
- c) In non-alcoholics, electrolyte levels stay the same during and after drinking alcohol
- d) Elotrans is a diarrhoea medication and TikTok is not the pinnacle of factfulness

14. Who benefits from vitamin D supplementation in terms of depressive symptoms? [Issue 12]

- a) Vitamin D supplements can reduce symptoms of depression in everyone
- b) People with strong depressive symptoms and normal vitamin D levels
- c) People with strong depressive symptoms and vitamin D deficiency
- d) People with slight depressive symptoms and normal vitamin D levels
- e) People with slight depressive symptoms and vitamin D deficiency



QUIZ QUESTIONS FROM 23 ISSUES!

15. Angora rabbits produce extraordinary wool, however due to animal welfare concerns the wool is less commonly used now by big fashion labels. How much wool can an angora rabbit produce per year depending on the breed? [Issue 13]

- a) 350g-1000g
- b) 450g-1200g
- c) 500g-900g



16. Earthworms are invasive in North America and affect the carbon storage capacity of the forest soil. How much have the carbon stores of the forest floor decreased with invasive earthworms present? [Issue 14]

- a) By up to 50%
- b) By 43 to 85%
- c) By 59% to 94%

17. Crop plant diseases can have serious consequences for humans, as they can affect global food supply. Clubroot is such a crop disease, which of the following plants are affected? [Issue 14]

- a) Broccoli, brussel sprouts
- b) Potatoes, tomatos
- c) Soy, corn

18. There is an increasing demand for Ejiao in China, a hard gel made from donkey skin that is used for its claimed rejuvenating benefits. How many donkeys are killed for Chinese Ejiao production per year (there are ~40million donkeys in the world)? [Issue 15]

- a) 1,25 million
- b) 3,74 million
- c) 4,48 million
- d) 6,88 million



19. What was the solution Prof. Schirmeier came up with to reduce plastic waste in the lab? [Issue 16]

20. How much does the Dresden zoo lose keeping Sawu the Elephant (per year)? [Issue 18]

- a) 15.000 €
- b) 50.000 €
- c) 100.000 €

21. Why is Sawu important for species conservation? [Issue 18]

22. What could be the economically positive effect of the wolf comeback in Germany? [Issue 19]



23. Egypt has created coral nurseries to propagate broken coral pieces and preserve their coral reefs. How much do corals grow per year? [Issue 20]

- a) 5,6 - 12 cm
- b) 0,3 - 10 cm
- c) 0,2 - 4 cm



24. Caviar is the unfertilized eggs of which type of fish? [Issue 22]

- a) sturgeon
- b) mackerel
- c) salmon

Answer Key

- | | | | | |
|---------------|----------------|----------------|---|--|
| 1. a | 7. a | 13. c | 19. Buying a commercial dishwasher (and sharing it with colleagues) to reuse their fly tubes. | 22. Less people in the forest to damage it And behavioural change of wolves' prey, reducing deer-related car accidents. |
| 2. c | 8. b | 14. b,e | 20. c | 23. b |
| 3. b | 9. b | 15. a | 21. She was caught in the wild, therefore her genes are not in the gene pool of zoo elephants. | 24. a |
| 4. a | 10. c | 16. c | | |
| 5. c | 11. a | 17. a | | |
| 6. b,c | 12. a,c | 18. c | | |