



## LIFE AS A SCIENTIST

Interviews with professional scientist, insights in their research and lives.

### Life As a Scientist – Interview with Dr. Brankatschk

**Hello Dr. Brankatschk, please introduce yourself and tell us about your research topic.**

I studied at the TUD, did my PhD at the IMP (Vienna) and started my group in 2017 at the BIOTEC here in Dresden. Our scientific focus is to study the biological activity of dietary lipids and resulting consequences for animals. Especially the latter aim is not feasible to address without suitable collaborators. We are lucky to have joined forces with multiple scientists based at the TUD including Dr. Tatian Sandoval-Guzman (CRTD, regeneration), Prof. Dr. Yael Politi (BCube, material science), Prof. Dr. Stephanie Schirmeier (Biology, neuro-glial metabolism), Prof. Dr. Klaus Reinhardt (Biology, ecology), Dr. Jacqueline Tabler (MPI-CBG, tissue mechanics) and Dr. Michal Grzbeck (PLID, insulin signaling). With our colleagues we are able to address many interesting questions such as: how do flies (and perhaps we) perceive dietary lipids?; what systemic metabolic changes are required to drive regeneration?; which dietary lipids increase fertility of males and why? Our long-term-aim is to connect lipid research with issues that concern our society. For example: we can see the fat contents on all kinds of products in the grocery store. They contain different ratios of saturated and unsaturated fatty acids. We want to find out why we prefer certain lipids, if we can taste them and how lipids in our diet affect us.

**What is one important finding you have made during your career as a scientist?**

The first time we were able to freeze and revive flies kept prior on designed lipid-defined food was perhaps the most important scientific discovery to me. Agreed, the results are not yet published and cryo-science is not much trending. Nevertheless, it was mind-blowing to me how dietary lipid compositions extended the temperature range of fruit flies beyond boundaries delimitating active biological life.

**What do you like most & least about your job and the academic world?**

The big Pro: My job is blessed with a very dynamic working atmosphere – I have the honor and pleasure to work with extremely smart and dedicated people on unique scientific questions. The broad spectrum of the field allows for the discovery of new phenomena on a regular basis. It feels almost like the quote from 'Moby Dick': "I am tormented by an everlasting itch for things remote, I love to sail forbidden seas ... " The Con: Most hated to me in academic science is the scientific rat race scientist created among themselves. That in particular is amplified by the fact that jobs in life-science are rare and in Germany mostly lack long-term perspectives. However, that's my personal views...

**You are working with the fruit fly "*Drosophila melanogaster*". What's one specific thing that fascinates you about *Drosophila*?**

To me, fruit flies are a tool between cell culture-based experiments and other animal models. Especially in metabolic research *Drosophila* should pioneer studies, and findings can later undergo verification in mammals.

**If you could not be a scientist what job would you like to do (outside from science)**

If not a scientist, I think I would like to have a ranger-like profession. I love trees and to experience the cycle of life firsthand (e.g. while in care for a forest) would certainly be satisfactory.

**What is your favourite book and which book would you recommend everyone to read?**

'Ibn Fadlan and the land of darkness'. However, I do not recommend books. There is no book not worth a minute. In my opinion, whoever decides to take time and energy to write and finish a book deserves some attention.

**What new thing would you like to learn?**

In private, I wished for more time to learn about geology and archeology. Its cliché but I believe it really: there is much to learn from our ancestors. In business, I need to catch up with programing ...

## FACT CHECK

In this section students evaluate the the scientific evidence behind a certain urban myth.

### Vitamin D - A Pill of Sunshine Against Depression?

Lilli Kratzer, Linda Krause and Hanna-Margareta Schwarzbach

"What is vitamin D? - The best antidepressant"<sup>1</sup> and "With a smile through the day? Easy!"<sup>2</sup>. Scientifically questionable sentences like these promote the use of vitamin D supplements, nowadays a common practice in society. According to such statements, vitamin D has preventive properties against diseases like the flu, cancer and depression.

In 2019, around 280 million people worldwide were suffering from depression<sup>3</sup>. It is a common mental illness that affects people of all ages, genders and ethnic groups. Depression can cause a feeling of apathy and can make the handling of day-to-day activities difficult. Depressed people have an increased risk of physical health problems and even of committing suicide<sup>4,5</sup>. In connection with depression, vitamin D gained scientific and public attention in recent years<sup>6,7</sup>.

So, is there really an association between low vitamin D levels and depression? Or the other way around, can vitamin D supplements help with depression?

Vitamin D deficiencies are widespread and mainly caused by the lack of sunlight in winter. Increasing indoor lifestyle and other individual factors like age or skin pigmentation also determine the amount of vitamin D the body produces<sup>8,9,10</sup>. Vitamin D is mainly produced in the skin during direct sun exposure and has many important functions in the body. Vitamin D is essential for keeping up normal levels of serotonin, which is a hormone in the brain. Normal serotonin levels as well as increased expression of vitamin D receptors in the brain are crucial for mood regulation. Serotonin can improve the mood by reducing feelings of anxiety and depression<sup>11</sup>.

Studies have investigated if low vitamin D levels and risk and severity of depression are connected. Some of them found an association<sup>12,13,14</sup>, others did not<sup>15,16,17</sup>. A major challenge in assessing the relationship between vitamin D levels and depression is to disentangle cause from effect. It is possible that depression causes the deficiency of vitamin D, since depressed people might not feel the urge to go outside<sup>18,19</sup>. This reverse causality needs to be considered. Given the unknown cause-effect relationship, studies on vitamin D supplementation were looked into for potential treatment options. However, the results were contradictory, ranging from no beneficial effects to reducing depressive symptoms<sup>20,21,22</sup>. Some of the factors that likely caused these very different conclusions are different study designs, small sample sizes, differences in the used vitamin D dosage and the duration of vitamin D supplementation<sup>23,24</sup>.

A common problem were differences in the study population<sup>25,26,27</sup>. When choosing study participants, it is important to consider that vitamin D levels depend on a variety of factors. Factors that may interfere with the efficacy of vitamin D supplements include socio- demographics (age, sex, ethnicity), sunlight, urbanization or health status (physical activity, BMI, smoking, drinking, chronic diseases)<sup>28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100</sup>. Most studies did not report or analyse their flaws or such interfering factors, even though they influence the findings<sup>49,50</sup>. However, a tendency was visible for specific conditions. For example, in two types of participants vitamin D supplements showed noticeable positive effects: 1) severely depressed people with normal vitamin D levels and 2) slightly depressed people with vitamin D deficiency. These people were statistically less depressed when they consumed vitamin D supplements<sup>44,47,48</sup>. By contrast, for slightly depressed individuals with normal vitamin D levels, vitamin D supplementation did not reduce depressive symptoms<sup>4</sup>.

All in all, there is no clear evidence that high vitamin D levels can alleviate depression. However, due to the variety of neurological effects of vitamin D, a link between the two is reasonable. For clinically depressed patients, vitamin D supplementation seems to work. However, even people with light depressions are advised to check possible vitamin D deficiencies with a doctor, since in this case supplementation has been shown to alleviate symptoms. So, with the current evidence at hand, only for those people does vitamin D mean "with a smile through the day". Vitamin D supplementation without medical advice should be used with caution at this time.

## EXCURSIONS AND OTHER NEWS

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

### Science in Stockholm – Lab Rotation

Klaudia Ostatek

I had the opportunity to do my lab rotation in the laboratory led by Prof. Jastroch, who is part of the department of Molecular Biosciences, the Wenner-Gren Institute, at Stockholm University, Sweden. With their research they aim to understand how energy is generated in different situations in biological systems.

Their projects investigate for example a protein called uncoupling protein 1 (UCP1). It is the main heat producing protein of brown fat cells, which allows for heat production in mammals without shivering. I was working on a project focused on naked mole rats, one of the most fascinating mammalian species. Naked mole rats are adapted to warm environments in Africa, thus may not require this thermoregulatory mechanism. We brought the UCP1 gene of the naked mole rats to human HEK293 cell culture. Then we checked how the expression of the foreign gene changed the metabolism of the human cells. We are happy about our results, which will be published soon.

In addition to the lab work, I met a lot of inspiring people and had the opportunity to explore Scandinavian countries and their culture. Overall, it was a great experience, both academically and personally!