

MIRNAS – MIGHTY TINY CREATURES



An interview with our
molecular biologist Maria Fauth

Judith: Dear Maria, already in your master thesis you dealt with miRNAs and now you are even writing your doctoral thesis on this topic. What fascinates you about these "mighty tiny creatures"?

Maria: It is not so long ago that miRNAs were regarded as mere waste products of cells because of their size. With the further development of sensitive and specific detection methods such as RT-qPCR or next generation sequencing, the first regulatory functions of miRNAs could be clarified, first in model organisms such as *C.elegans* and then also in humans. Today, more than 2000 miRNAs are known in humans and many of them are associated with diseases such as cancer. It is fascinating how this once called "cell debris", has turned out to be an important regulatory element with high potential for use as biomarkers or targets of new therapeutics.

Judith: You have been with Prolytic GmbH for two years now and are doing research on miRNAs as biomarkers for lung cancer and the determination of miRNAs in human plasma under Good Laboratory Practice (GLP) conditions. Why did you decide to do your doctorate in a company?

Maria: Already in my bachelor thesis at the Justus-Liebig-University of Gießen I dealt with miRNA-122 in connection with hepatitis C and a possible therapeutic method. This first insight into applied research prompted me to switch to the Technical University of Darmstadt, which has more contact with companies. I wanted to understand the steps from applied research in the university to direct application in the company by writing a master thesis in a company. This experience was finally made possible for me by a cooperation between the TU Darmstadt and Prolytic GmbH by Dr. Dorothee Krone and Dr. Meike Saul with a master thesis and subsequent doctorate. I am still very grateful for this, because this way (even if it sounds a bit kitschy now) I can do research on my dream topic, miRNAs, in direct application in a company.

Judith: Although you work at Prolytic and have become a very valuable member of our team, you are of course also working closely with your doctoral mother Dr. Meike Saul at the TU Darmstadt. What advantages does this cooperation between research and industry have for you and also for the project?

Maria: The cooperation between university and company gives me two perspectives on a joint project. University research puts more emphasis on other things than economic research, and vice versa. So different incentives and ideas come together to move the project forward. Due to the close cooperation with both institutions, especially with Dr. Saul and Dr. Krone, I noticed more and more the differences in the scientific language. The biggest advantage I personally derive from the cooperation is the understanding of both blinking angles towards a common research goal and the sometimes very different language of both institutions.

Judith: In your doctorate you are working on the further development of miRNA analysis methods and their application in a biomarker study with lung cancer patients. A particular challenge is the validation of the analytical method according to GLP standards. Is it difficult to conduct research under GLP? The regulations of GLP are quite restrictive.

Maria: Doing research under GLP is much less complicated than you think. Because all the preliminary tests and development work are performed under normal conditions comparable to those at universities. Important investigations, validations and measurements of human samples are then carried out under the regulating GLP conditions. This regulation underpins the validity of our research results, which is a great advantage of the sometimes complex work and documentation under GLP. In general, research under GLP has shaped me in such a way that I view research results very critically. After all, this highly regulated working and documentation has taught me how great the influence of the smallest (sometimes unconscious) changes in the performance of experiments can be on the final result. It is a curse and a blessing at the same time, as the sometimes very elaborate documentation enabled us to understand and solve some of the problems associated with the handling of plasma and the analysis of small amounts of miRNAs.

Judith: After the successful completion of the ZIM project last year, you are now already fully involved in the next research project on the topic "Development of a diagnostic test based on miRNA-574-5p

as a predictive biomarker for prostaglandin E2-mediated tumors". Here you can look beyond the analytical horizon and explore the potential of miRNA-574-5p as a biomarker in a clinical study in a joint project with the TU Darmstadt and the University of Giessen. Wouldn't it be great if lung cancer patients could receive the right therapy based on your research?

Maria: I think that is the dream of every scientist that his or her research will make a difference in the world and change it for the better. It would of course be great if our clinical trial delivers promising results and we can establish miRNA-574-5p as a biomarker. The goal is to develop a diagnostic kit. This would save many lung cancer patients from unnecessary, ineffective therapies.

Judith.: You have already achieved a lot during your research career. What are your goals and wishes for the future?

Maria: I hope that our joint research project will continue to be successful and that I will be able to work with our great team for a long time to come. Next year we are aiming for another scientific paper. For this we could gain some very interesting insights regarding the normalization of RT-qPCR data of miRNAs. I would also be very pleased if Prolytic GmbH could draw an added value for itself as a scientific institution from the experience of this research work.

Judith: Dear Maria, we are very happy that you are part of the Prolytic team and follow your success in miRNA research with great enthusiasm. Many thanks!