INTERVIEW WITH CEITEC SCIENTIST

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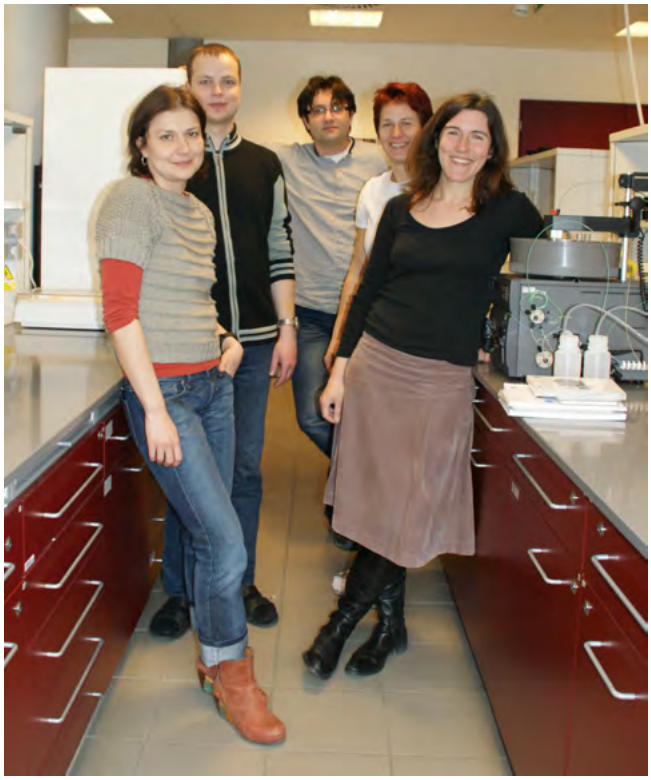
Research Group **Biomolecular NMR Spectroscopy**
Research Programme **Structural Biology**

To start with could you outline the main focus and aims of your research, and explain why you chose to work at CEITEC on your return to the Czech Republic two years ago?

Our laboratory focusses on the identification of regulating elements and mechanisms in the non-coding part of the genome, in which we assume there is potential for its use as a therapeutic target in a wide range of pathological states from cancer to various developmental diseases. In simpler terms: we are studying certain areas of genomic DNA, which control something in the cell. We will then try to find out how we might through the DNA influence that control.



Beginning at CEITEC - the composition of the group in 2012 (from the left: Silvie Trantírková, Jan Ryneš, Lukáš Trantírek, Barbora El-Ghanammová, Lola Bajard)

There were basically three reasons for choosing CEITEC. In the first place was the factor of a strong scientific community, and an inspiring environment linked to it. Primarily I work in the field of DNA research and Brno is a kind of 'Mecca' in this area and not only within the Czech Republic. In Brno, and in CEITEC, there is a whole range of internationally renowned scientists in this field such as for example Prof. Vladimír Sklenář (NMR spectroscopy of nucleic acids), Prof. Jiří Šponer (computational chemistry of nucleic acids), Prof. Michaela Vorlíčková (CD spectroscopy of nucleic acids), or Prof. Jiří Fajkus and Dr. Karel Říha working with the non-coding parts of the genome responsible for its integrity. From the younger generation a range of talented scientists are working in CEITEC such as Ass. Prof. Richard Štefl, Dr. Peter Lukavsky and Ass. Prof. Štěpánka Vaňáčová, who are looking into closely connected problems involving RNA. A second factor in the choice was the equipment of the newly -established Josef Dadok National NMR Centre, which can stand comparison with the world's best and makes possible the most demanding NMR measurements (the NMR spectrometer is a basic instrument for our research). A third, and for me very important, factor was the attractive start-up package allowing me to establish an independent research group.

You spent four years at Utrecht University in the Netherlands and so are well placed to compare the situation there and in the Czech Republic. How would you rate conditions for scientists, support at the national level, competition for grants, etc.?

I will reply in a roundabout way because a fair comparison of research in the Czech Republic and the Netherlands would take up many pages. It certainly isn't the case that research financing in the Netherlands was much better than in the Czech Republic. Dutch universities have suffered a kind of minor crisis in the last five years, caused by an unfortunate change in the rules for

their financing, and that of research overall. Specifically this involved the transfer of what was previously institutional financial means to the grant agency. The original intent of the Dutch government was to strengthen excellence in research with the assumption that excellent universities would gain money while the less good would either improve or disappear. The new system certainly made possible an increase in funds for excellent scientists and research groups, but without any visible correlation with a growth in research quality. Excellent groups simply continued to be excellent. It is important to be aware that the money does not flow into the institutions as such, but to a small group of their employees. As a result this shift from institutional money to grant money had a very negative impact on the delivery of education and the running of the whole institution. All of a sudden there wasn't money to pay lecturers and not even for administrative assistants. At the University of Utrecht, which has been repeatedly assessed as the best in the Netherlands, this led to the closing of whole areas and departments, and thanks to redundancies even to a transfer of teaching and admin to the scientists that were successful in gaining grants. And since I was a first-hand witness to this, I am now disconcerted to hear in the Czech Republic plans for the strengthening of excellence that sound dangerously similar to the Dutch model I have described.

Lukáš Trantírek was born in Moravská Třebová, in the Czech Republic, in 1975. He obtained his MSc in organic chemistry from Masaryk University in Brno in 1998. In 2001, he obtained his Ph.D. from Masaryk University under the direction of Prof. Vladimír Sklenář. He was an EMBO postdoctoral fellow in the group of Juli Feigon at the University of California in Los Angeles from 2002 to 2003. In 2012, following his independent career at the University of Utrecht, The Netherlands, he joined CEITEC as a junior group leader in the research group of Biomolecular NMR Spectroscopy. His research is focused on the structural biology of nucleic acids and NMR spectroscopy.

What on the other hand should be an inspiration for the Czech Republic is their strategy for the education of students at university, especially at postgraduate level. In the Netherlands there is a great deal of competition for places on courses at all levels in comparison with here. Therefore the demands on students during their studies are, and can be, significantly higher. The consequence is that the quality and capacities of the average Utrecht University graduate are substantially better than those of the average graduate from any Czech university. Much of the responsibility for this state of affairs lies at the door of our accreditation commission.

To return to the question – I see the conditions for scientific workers in the Czech Republic as being good. Or I should say that they are no better or worse than anywhere else in the world.

You yourself have been very successful in gaining scientific grants and your wife was successful in the latest call for SoMoPro. Could you let us know what lies behind these excellent results?

Luck, tens of hours spent preparing grant applications and, we kind of kid ourselves, also the original approaches we propose for the resolution of scientific problems. Among other factors undoubtedly belongs what the scientific community refers to as "track record", including experience from top foreign laboratories and good publication output.

For a time you were involved in the running of the Faculty of Science of the University of South Bohemia. What did you gain from this experience and how did it influence your view of the bureaucracy which is often connected with Czech science?

From today's perspective I see taking up the function of vice-dean for the operation of the faculty as important experience. I accepted the post from pure naivety and at a time when I was still starting up my laboratory. The multitude of duties and administration connected to the role kept me busy 8-10 hours a day. And alongside that teaching as well. Both the laboratory and my family suffered. Nonetheless every cloud has a silver lining: Firstly I learned how important it is when running things to be able to delegate (provided there is someone to delegate to), consistency and predictability in decision-making (something I use both when testing students as well as in running the laboratory), and communication with others. Since that time I have had a deep respect for those doing good work in academic roles – it is a service to the community and not all by any means show gratitude.

My perspective on bureaucracy was changed by taking on the role of vice dean in that I have learned to distinguish between essential and non-essential administration. At present, admin takes up 60-70% of my time. I think I can say that about 50% of this admin can be put in the unnecessary group, the group that really should not exist. Reducing this excess admin, in my opinion would be one of the first steps toward the more efficient functioning of Czech universities.

Returning several years back, what was the main impulse behind your scientific career? Did you enjoy chemistry already at primary/secondary school?

Did I enjoy chemistry? Certainly not at primary school. At secondary school yes. After girls and outdoor sports it was my favourite area of interest. :-)

My scientific career, even if I do not like the term, began I guess in the first year postgraduate studies. Under Prof. Vladimír Sklenář I had the chance to work on the characterisation of a new type of DNA helix, which was one of those projects that even after successful resolution generated a whole range of further problems, questions and projects. I guess that then I felt, 'my god I have to see it through to completion'. And I'm still trying to complete it even now. :-)

By what criteria did you choose a location for your post-doctoral placement?

I chose my post-doctoral placement on a combination of two factors: a) topic – I wanted to continue with the NMR spectroscopy of nucleic acids, and b) location. California was simply more attractive for me than for example Sweden or the Netherlands, where I also had offers. If you ask whether the prestige of the laboratory was an important factor in my choice, then I have to say it wasn't. Nonetheless if I were a student today looking for a foreign placement, I would also take this factor into consideration. Fortunately for me the laboratory of Prof. Juli Feigon at the University of California Los Angeles was at the top of the field.

What do you see as the most important aspect of a well-functioning scientific team?

This is not a simple question. The most important aspects of a well-functioning group are its productivity and recognition in the international scientific community. These two factors imply that such a group works on important problems or, thanks to their originality, come out with a completely new discovery. In the ideal case a combination of the two. From a different perspective – the most important aspects for a well-functioning scientific group are stable financing for a period of more than three years, a minimum of administration and access to students with a good grasp of the fundamentals. In each of these areas we have a certain amount of ground to make up in the Czech Republic.

And finally an obligatory question – what do you see as the greatest success of your career? And what are your ambitions and further scientific plans within CEITEC?

Concerning the first question. Personally I would see it as the development of two approaches which made possible the structural characterisation of nucleic acids, and that at the level of resolving individual atoms, in the complex environment of the living cell. Since the structure of DNA reacts very sensitively to a range of physico-chemical factors in its surroundings, these approaches have turned out to be fundamental in identifying the bioactive conformation of DNA, which is an essential precondition for their rational therapeutic targeting.

As to the second question: Our research is fundamental in nature. Nonetheless I would be happy if we managed to find applications for at least some of our discoveries. That however is very much for the long term. In terms of fundamental research my ambition remains to find the principle allowing for the rational development of medicines having specificity for a particular position on the genome. Currently all known medicines are non-specific, which means that they have a whole range of undesirable side effects for potential patients.

Thank you for the interview!