

Resistant cell lines and omics in oncology research

Marcus Klüssendorf talks to Elyas Bozan about the work of the Frankfurt Foundation for Children with Cancer



Marcus Klüssendorf



Elyas Bozan

Marcus Klüssendorf talks to Elyas Bozan about the work of the Frankfurt Foundation for Children with Cancer.

Mr Klüssendorf, you head the Frankfurt Foundation for Children with Cancer. What exactly does your foundation do?

The Frankfurt Foundation for Children with Cancer was founded in 1994 by affected parents who knew what it meant to receive a cancer diagnosis for their child. The purpose then, as now, was to give children and young people a chance of a cure and a perspective on a life without long-term consequences.

Due to the generous bequest of Dr. Petra Joh, who died of cancer at the age of 32, a research house of the same name could be built in 2004, where up to 60 researchers are provided with the spatial, technical and personnel equipment for their top-level research.

We work closely with the Frankfurt University Hospital. This cooperation has also resulted in an endowed professorship that has been awarded for many years.

What are the research areas, interest and goals of the foundation?

At the Dr. Petra Joh Research House, we conduct research at the highest level in the fields of molecular biology, cell research, virology, oncology and haematology.

We have two focal points within research, on the one hand the investigation of fundamental cellular processes and on the other hand the research of resistances.

The Institute for Experimental Tumour Research in Paediatrics works at the interface of biochemical, cell and molecular biological basic research on the one hand and applied clinical research in paediatric oncology on the other. The overarching goal is to investigate fundamental cellular processes, e.g. signalling pathways.

Another important area of research deals with the emergence of resistance. The emergence of resistance is the main reason for the failure of cancer therapies. The Interdisciplinary Laboratory for Paediatric Tumour and Virus Research (IDL) focuses on investigating how cancer cells become resistant to drugs and uses this information to develop new therapeutic approaches for treating cancers for which there are currently no suitable treatment options. This is done with the help of a unique cell bank, the RCCL - "Resistant Cancer Cell Line-Collection". Our research house hosts over 2500 of these cancer-resistant cell lines in its own cryotanks at -196 degrees Celsius.

What have you achieved so far, what are the milestones of the foundation?

30 years ago, 4 out of 5 children were diagnosed with cancer and died. Today, it is 1 in 5 children. These figures are due to research and the associated, more effective and more targeted therapies.

Furthermore, the RCCL Collection should be mentioned, which is unique worldwide and has been built up over 40 years. Around 120 renowned research organisations across all continents of the world are conducting research on projects with cells from the RCCL Collection.

The world's first isolation of the SARS 1 pathogen (Covid = SARS 2) in 2003 by Prof. Cinatl and his team can be cited as a singular success. Furthermore, we were able to report a success in 2018 with the research of the biomarker SAMHD1. Older patients suffering from acute myeloid leukaemia (AML) are often administered the drug Decitabine. However, if the biomarker can be detected more strongly, this form of therapy is very unlikely to be successful. This detection spares the patients unnecessary agony.

We are also celebrating an anniversary next year: over 40 years of the RCCL Collection, 30 years of the Foundation, 20 years of the Research Centre.

You work "translationally" - can you explain what this means?

The term translational refers to the transfer of new research findings from the laboratory to clinical application.

Through the close connection with the paediatric oncology department of the university hospital, research results are applied as quickly as possible. On the other hand, the clinic provides us with data and samples for further research.

Thus, our research always focuses on practical application.

In "personalised medicine", huge amounts of data are collected and processed, just like in the RCCL Collection. What kind of data is it and how do you process it?

Certainly, our research does not focus on "personalised medicine", but on preclinical (applied) basic research. However, research into further biomarkers can significantly influence individual cancer therapies.

In the future, the systematic investigation of the RCCL collection will increasingly be carried out using so-called "omics methods", primarily those of proteins (proteomics) and genes (genomics).

This involves the recording and analysis of all protein or DNA sequences. Whereas in genetics, for example, the focus is usually on the examination and effect of individual genes, in genomics all DNA sequences of the entire genome of an organism are recorded and examined.

This means that vast amounts of data have to be collected and analysed. Data processing is - as with many others - a challenge and is also undergoing a transformation process. New analytical methods lead to the generation of large amounts of data, which are examined using specific software / hardware.

What are their challenges? How can we support them?

On the one hand, we want to raise the profile of our foundation. As the saying goes: "Do good and talk about it". To do this, networking with supporters, companions and sponsors is essential.

In order to be able to finance the scientific challenges, it is also important to me as the Managing Director to ensure the operation of the Research House. We do not receive any public funding and are therefore dependent on the support of the public, as well as on donations and the industry. In concrete terms, we are currently planning several projects, such as the characterisation of cell bank resistance models using "omics methods", among others, at a cost of 3 million euros. Any support for this is most welcome and we invite all interested parties to visit us in our research house.

Mr. Elyas Bozan: The work done by the Frankfurt Foundation for Children with Cancer is fundamental for better chances of recovery and fewer negative consequences for affected children and young people. We are happy to support it out of conviction and urge others in our network to do so as well.

Thank you very much for this interview!