Q&A SESSION WITH MANFRED JUNG

MANFRED JUNG, Professor, **Freiburg University**

Manfred Jung did his PhD at the University of Marburg in 1993, then worked as a postdoc with T. Durst at the University of Ottawa. From 1994 to 2003 he was a group leader at the University of Münster and obtained his habilitation in Pharmaceutical Chemistry in 2000. Since 2003 he was a Professor of Pharmaceutical Chemistry at the University of Freiburg and since 2011 he is Full Professor there. In 2011/12 and for 2016/17 he was appointed as Senior Fellow at the Freiburg Institute of Advanced Studies (FRIAS). Prof. Jung was Dean of the Faculty of Chemistry and Pharmacy from 2015-2018 and is currently Vice-Dean. The topic of his research is Chemical Epigenetics with a major focus on histone modifying enzymes. His group is working on inhibitor synthesis, assay development and screening for inhibitors of reversible histone acetylation and methylation, as well as methyl-lysine reader proteins. For more information, please visit www.jungm.de

What are the key benefits of soft drug and prodrug principles?

Drugs normally act in every cell of the body. Soft drugs (also called antedrugs) for instance, will only act when applied locally on the skin or in the lung, and will not have systemic side effects. Prodrugs can be used to be activated, to again be active in any cells, but we try to target the activation. We want to treat specific cells and not the whole body with drugs.

Do you generally use both of those, i.e. a combination of the two?

I would say there are very few examples of combinations. So far, we have used them in basic science separately, but we might want to combine them.

Looking towards the future, is that the aim of the industry?

I'm an academic researcher; we want to do some sub-cellular targeting. For instance, can we target just specific parts of the cell? We want to play with directed activation and directed deactivation of drugs to switch on chemical tools and also switch them off in a confined environment. Eventually, this might be applied in drug development.

What are some of the challenges in activation and deactivation?

The challenges are to bring the activation or deactivation device to the same target. However, we are dealing with small molecules so there's always diffusion, and the system will be always be a bit leaky - it will not be like an antibody that just sticks to the specific cell. The challenges are: can we allow some diffusion, some of what is called the bystander effect, is that helpful in some cases? Or will it be harmful but still less harmful than systemically applied drugs?

With the development of epigenetic drugs, are there any key innovations or technologies that have furthered that development?

Generally, many epigenetic drug candidates are in clinical trials.There are very few examples of soft drugs or prodrugs so far; there is just one epigenetic soft drug clinical trial by a company. Additionally, I'm not aware of prodrugs or of epigenetic drugs in clinical development. These principles are known. They are approved for other drugs but haven't really been applied to everything.

What are the key priorities of your work in this area?

It's mostly basic science. The soft drug approach might go towards the development stage, but the prodrug approach, with what we aim at, will be to push the limits of how much or how narrowly we can define the action of a small molecule to a confined space. This is currently more of an academic project, however, that might be a development possibility later on.

What would you say are the top three takeaways from your presentation?

Soft drug approaches can also be usefully applied to epigenetic drugs. Certain targeted activation methodology might be very suitable for epigenetic drugs. We are also aiming to push the limits of targeted action of compounds in a sub-cellular fashion.

What is your general aim for attending congresses like this one?

These events are interesting because of the mix of academic and corporate presentations from solution providers, and to also network with them and be aware of new developments. Additionally, I co-founded a biotechnology company with some colleagues, so some of the services that are more industry-focused might become more relevant for me. Overall, it's a good mix. One of the new hottest things is protein degradation which was also covered.

Is there any specific direction that you see the future of industry headed? Or are you looking at the academic side of it?

We're an academic laboratory, so we want to focus on basic research, develop new application for small molecules, especially epigenetic drugs; for example, treating parasitic diseases, to open up avenues. However, with this biotechnology company, we also want to really follow the path into clinical development.