



Learning more about the role of mitochondrial dysfunction in Parkinson's to help develop better therapies

New, more effective treatments are urgently needed for the more than one million people living with Parkinson's in Europe today. PD-MitoQUANT (www.pdmitoquant.eu) is an Innovative Medicines Initiative (IMI) project investigating the role of mitochondrial malfunction in Parkinson's. Academic experts, Small/Medium Enterprises (SMEs), pharmaceutical companies from the European Federation of Pharmaceutical Industries and Associations (EFPIA) and the patient advocacy organisation, Parkinson's UK have assembled in this project to: (i) improve our understanding of mitochondrial dysfunction in Parkinson's, (ii) validate molecular drivers and mechanisms, (iii) develop improved models for study, and (iv) discover novel therapeutic targets for future therapies.

Message from Coordinator Prof Jochen Prehn

"We are nearing the end of the second year of PD-MitoQUANT, and are starting to make interesting discoveries using the models, protocols and assays developed by the consortium. Our researchers across Europe are hard at work collecting and analysing data from a wide range of experiments in both cultured cells and pre-clinical models.

For example, partners are studying if a novel form of α -synuclein (α Syn) affects the production and use of energy in mitochondria (RCSI, UCL), whether it induces cell death (Lundbeck) and whether α Syn alters protein uptake into mitochondria or the degradation of damaged mitochondria (ICM, RUMC). Studies are also on-going to examine whether α Syn affects the transmission of signals from neuron to neuron (Teva), and how it changes the landscape of mitochondrial proteins (CNRS). The effects of α Syn on different brain regions and on markers related to disease progression are also being measured (ICM, DZNE, Lundbeck).

As more and more data is generated, bioinformatics and network analyses (RCSI, GENEXPLAIN, UCB) are now starting in order to identify potential targets for future validation in the final year of the project."



Coordinator,
Prof. Jochen Prehn

Keep an eye on our [Publications page](#) for all our latest papers!

You can also meet some of our early- and mid-stage researchers on our [Researchers profile page](#).



PARKINSON'S^{UK}
CHANGE ATTITUDES.
FIND A CURE.
JOIN US.

Parkinson's UK Virtual Research Conference

PD-MitoQUANT patient advocacy partner Parkinson's UK (www.parkinsons.org.uk) held their bi-annual research conference virtually this year on the 24th - 25th September. The theme of the conference was "Accelerating research and improving care."

Keynote lectures were delivered live from around the world, and several researchers from PD-MitoQUANT partner organisations were involved during the event. Research was presented by Prof Donato Di Monte of the German Center for Neurodegenerative Diseases (DZNE, www.dzne.de), and from the RCSI University of Medicine and Health Sciences (www.rcsi.com) by Dr Niamh Connolly. Dr. Sonia Gandhi of University College London (UCL, www.ucl.ac.uk) and Prof David Dexter from Parkinson's UK both chaired a range of sessions, including one focusing on mechanisms of neurodegeneration and another introducing new and emerging drug therapies emerging therapeutic strategies.

The event was an excellent example of adapting to the times! #newnormal



You can read more about the conference here: <https://bit.ly/3ncFOds>

Raising funds for Parkinson's Association of Ireland

Women from the RCSI University of Medicine and Health Sciences in Ireland (www.rcsi.com) and Pintail Limited (www.pintail.eu) completed the Vhi Virtual Women's Mini-Marathon on the 2nd of October to fundraise for the Parkinson's Association of Ireland (www.parkinsons.ie). In total, €770 was raised by the PD-MitoQUANT team, which included Orla Watters, Niamh Connolly, Helena Bonner, Patsy Connolly and Elisabeth Jirstrom, Kylie O'Brien and Danielle Nicholson who completed their 10 km in four different counties across Ireland.





Partner Spotlight - GeneXplain



GeneXplain GmbH (GENEXPLAIN, www.genexplain.com) is a leading software company providing systems biology platforms for deciphering mechanisms of biological processes and human diseases. GENEXPLAIN was founded by the originator of the TRANSFAC® database, Prof. Dr. Edgar Wingender and by the creator of promoter and network analysis algorithms, Dr. Alexander Kel. TRANSFAC® is a unique database on eukaryotic transcription factors, their genomic binding sites and DNA-binding profiles.

Within PD-MitoQUANT, GENEXPLAIN will:

- perform gene and pathway enrichment analysis of proteostasis signalling pathways and of novel transcriptome/proteome dysregulation, and
- apply their databases and software tools to identify master regulators and dominant signalling pathways of cellular toxicity and mitochondrial dysfunction associated with α Syn.

Dr. Alexander Kel is Chief Scientific Officer in GENEXPLAIN and received his Ph.D. in Bioinformatics, Molecular Biology and Genetics in 1990. In 1999, he received independent funding from the Volkswagen foundation and organised a Bioinformatics group at the Institute of Cytology and Genetics. From 2000 to 2010, he was the Senior Vice President of Research & Development at BIOBASE GmbH, Wolfenbüttel, Germany. He spoke with Paula Scurfield from our patient advocacy partner Parkinson's UK about GENEXPLAIN's role in the project.



Dr. Alexander Kel

What is the focus of your research and how does it relate to the wider project?

Our research is related to helping people with Parkinson's. As bioinformaticians, we try to understand the complexity of the disease. Scientists often tend to simplify things in order to better comprehend them, but we shouldn't forget that the molecular mechanisms of diseases such as Parkinson's are very complex. Computer modelling can help to tackle complex problems, like measuring how thousands of genes in neurons change in models of Parkinson's, or even in patients, to identify genes to focus on (master-regulators) to improve our understanding.

How do you think your work will contribute to new treatments for the symptoms of Parkinson's or even contribute to a cure in the long term?

This project doesn't aim to deliver a therapy but we will create technologies and disease markers that will be useful in future. For example, we will see how malfunctioning of mitochondria is related to Parkinson's in order to discover markers of malfunctioning and identify targets for drug discovery beyond the project. The technologies we develop can be used by drug companies in their discovery processes. If we are lucky, we may even discover drug targets during the project.



Neuronet Awareness Campaign



Neuronet (www.imi-neuronet.org) is an Innovative Medicines Initiative (IMI) project that is working to bring together other IMI projects in the area of neurodegenerative diseases. The Neuronet team recently conducted interviews with researchers from the projects involved, which included Dr. Shruti Desai of the Radboud University Nijmegen Medical Center (RUMC, www.radboudumc.nl). You can read the full interview with Dr. Desai here: <https://bit.ly/32xsxUR>.



“Working with different groups of experts has immense benefits. There is a flow of information and materials that makes science drive faster and smoother. A considerable part of my work is based on collaborative work through labs across Europe, public and private partners alike, everyone is dedicated towards our common goal.”

PD-MitoQUANT's Dr. Dana Bar-On of Teva Pharmaceutical Industries (www.tevapharm.com) and Dr. Orla Watters (RCSI, www.rcsi.com) also featured in the #WeAreNeuronet Twitter campaign.



“I think the main benefit of this unique partnership is an open dialogue and stimulating interactions with leading academic partners and key opinion leaders in the field of Parkinson's. In addition, the exposure to cutting edge technologies, animal, in vitro and ex-vivo models in this field is very instrumental to Teva”

Mitochondrial Disease Awareness Week

PD-MitoQUANT partners joined the Twitter campaign for World Mitochondrial Disease Awareness Week (13th - 19th September). The role of mitochondria in Parkinson's is still unknown. PD-MitoQUANT aims to learn more about mitochondrial dysfunction and develop better models of Parkinson's. #WMDW



PD-MitoQUANT Partners



This project has received funding from the Innovative Medicines Initiative 2 Joint Undertaking under grant agreement No 821522. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and EFPIA and Parkinson's UK. The material presented and views expressed here reflect the author's view and neither IMI nor the European Union, EFPIA, or any Associated Partners are responsible for any use that may be made of the information contained herein.

