

New applications for tried and tested medicines

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The Medical University of Vienna is coordinating an international research project, which investigates the effectiveness of tried and tested medicines for the treatment of some of the heaviest burdens of our modern society including diseases such as cancer, diabetes and cardiovascular diseases. One molecule that these disorders have in common is a receptor known as the calcium-sensing receptor (CaSR), which is the molecular starting point of this project. Abnormal CaSR function can not only trigger familial benign hypercalcaemia and hyperparathyroidism but it is also involved in various other diseases such as Alzheimer's disease, diabetes, cancer and cardiovascular diseases. A

four-year EU project is now investigating whether these medicines that modulate the function of CaSR, could be used for the treatment of the above-mentioned diseases.

The calcium-sensing receptor (CaSR) is not only the main regulator of [calcium metabolism](#) but is also involved in other physiological processes to maintain normal body functions. Research findings indicate that abnormal CaSR function and/or abundance play a significant role in the development or progression of several [non-communicable diseases](#) (or NCDs) such as Alzheimer's disease, cardiovascular diseases, diabetes, cancer, and degenerative muscle loss. These diseases account for 25% of all illnesses in the world.

Different diseases – same starting point

G-protein-coupled receptors (GPCRs), such as the CaSR, are molecular targets for more than 35% of all modern pharmaceutical compounds. The Marie Skłodowska-Curie European Training Network (ETN) "CaSR Biomedicine" project will therefore not only investigate fundamental questions about cell type- and ligand-specific signalling pathways of the CaSR, but will primarily test novel effects and applications of CaSR-directed drugs in 14 multi-disciplinary sub-projects in 8 countries. These subprojects will focus on ageing-associated diseases (such as Alzheimer's disease, cardiovascular diseases, diabetes, muscle weakness) and on various forms of cancer such as neuroblastoma, colon, or breast cancer.

"As these CaSR-modulating drugs already exist, even though their use is currently restricted to a few diseases, they have been tested and approved for human use," explains project coordinator Enikő Kallay of the Department of Pathophysiology and Allergy Research at the Center of Pathophysiology, Infectiology and Immunology. "If these drugs could also be successfully used to treat other diseases, which would save a lot

of time and money that are needed for the development and approval of new drugs."

The team led by Daniela Riccardi (Professor at Cardiff University and a partner in the ETN) received international acclaim for the discovery that Asthma, a common chronic disease could be successfully treated using existing CaSR-inhibiting drugs. Finding ways to use CaSR-directed drugs also for the treatment of diseases such as diabetes, Alzheimer's [disease](#) and various types of cancer, would be a breakthrough.

This four-year "CaSR Biomedicine" project is the second European Training Network that Enikö Kallay has brought to the MedUni Vienna in the last five years. By coordinating this Marie Skłodowska-Curie Actions project, which is funded by 3.6-million-Euros of the Horizon 2020 programme of the EU, Enikö Kallay facilitates the cooperation of 13 research groups in eight countries – a network which will foster research excellence centred around the MedUni Vienna. In addition to the overall coordination of this international collaborative research and training programme, Enikö Kallay will also supervise its research activities taking place at the Medical University of Vienna. Sabina Baumgartner-Parzer of the Clinical Division of Endocrinology & Metabolism (Department of Internal Medicine III) and Isabella Ellinger (Institute of Pathophysiology and Allergy Research) will be assisting her in the implementation of the project.

MedUni Vienna coordinates international PhD programme

Apart from gaining scientific insights, the main priority of "CaSR Biomedicine" is to train young scientists within the context of an international doctoral programme. Besides the experimental methods and techniques involved in scientific laboratory work and the courses

offered by the partner universities, the training programme covers also aspects of medical ethics, modern presentation techniques and communication strategies, as well as quality and risk management.

In order to ensure that young researchers are not prepared exclusively for academic and research-oriented careers, the "CaSR Biomedicine" training programme also offers workshops about start-ups, and entrepreneurship. Founders of start-up companies and top managers of leading companies from around the world have accepted to train the PhD students in this programme. This means that the young scientists will benefit from high quality education and excellent training that will open multiple career opportunities – both in academia and in the private sector as researchers, managers, or entrepreneurs.

Provided by Medical University of Vienna

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