IMBA Press Release

22. October 2012

Breast cancer advance wins $7.4m US award for Austrian Research Institute

A new approach to possible future prevention of breast cancer and slowing the spread of tumours has won Austrian researcher Josef Penninger, director of the Institute of Molecular Biotechnology of the Austrian Academy of Sciences (IMBA) in Vienna, a $7.4 million innovator's award to continue his research, from the USA's Congressionally Directed Medical Research Program.

The innovator's award recognises Josef Penninger's work in identifying a key molecular pathway how hormone replacement therapies and contraceptive pills can lead to breast cancer. His team provided the first genetic proof that a protein called RANKL is the master regulator of bone loss, which has contributed to the development of a novel drug already approved for the treatment of osteoporosis and skeletal related events in multiple cancers. He was also the first to discover that RANKL not only regulates bone loss but is absolutely essential to enable sex hormone driven lactation in pregnant females, a finding that could explain further the connection between sex hormones and bone loss. Based on these groundbreaking findings, Penninger's group went on to show that RANKL is indeed a missing link between sex hormones, in particular the sex hormone progesterone, and breast cancer, leading to the hypothesis that RANKL is a key driver of breast cancer initiation.

In addition, Penninger's group has developed entirely novel genetics tools, so-called haploid stem cells, to quickly assess the function of specific genes that cause breast cancer and help tumours to spread. "This is the next step in the post genome era of cancer", says Prof Josef Penninger. "We will use our new technologies to rapidly check the function of hundreds or even thousands of human breast cancer gene candidates". The Austrian researchers expect to verify new breast cancer pathways, which they hope will quickly lead to a major impact in preventing and treating the disease.

Supported by the $7.4 million award, Josef Penninger intends to further use this knowledge to develop a new diagnostic method that helps in making predictions concerning the chances that any patient will develop breast cancer. At risk patients will then be able to start preventative treatment using the existing RANK ligand-blocking medicines. Josef Penninger adds: "If our experimental data could be extrapolated to humans, which is what we strongly believe, then we might have an entirely novel way of early breast cancer detection and, since RANKL inhibition is already used in patients, we even would have a medicine within immediate reach that could be used to possibly prevent the disease in those women at high risk".

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IMBA Institute of Molecular Biotechnology of the Austrian Academy of Sciences

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IMBA:

The Institute of Molecular Biotechnology (IMBA) combines fundamental and applied research in the field of biomedicine. Interdisciplinary research groups address functional genetic questions, particularly those related to the origin of disease. IMBA is a subsidiary of the Austrian Academy of Sciences, the leading organization promoting non-university academic basic research in Austria. Earlier this year IMBA was voted as second to top international workplace for postdoctoral researchers, by readers of the US based and online life sciences magazine, The Scientist.

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References:

Schramek et al. (2010). Osteoclast differentiation factor RANKL controls development of progestin-driven mammary cancer. Nature. 468(7320):98-102

IMBA press release from 2010: „Researchers find how HRT and the Pill can lead to breast cancer and suggest possible treatment“
http://www.imba.oeaw.ac.at/uploads/media/presstext100929-breast_cancer.pdf

Innovator Award:

Josef Penninger was awarded with the Innovator Award for his project “Novel Approaches to Breast Cancer Prevention and Inhibition of Metastases” (contract number W81XWH-12-1-0093) through the US Department of Defense. Congressionally Directed Medical Research Program:
http://cdmrp.army.mil/bcrp/

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