

PRESS RELEASE

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German and US Partners Join Forces in Stem Cell Research to Accelerate Development of New Therapies

La Jolla, CA, Kiel, Hamburg – Researchers at The Scripps Research Institute (TSRI) in California, USA, and two German institutes, the Center for Integrated Psychiatry Kiel (ZIP) and the Fraunhofer Institute for Molecular Biology and Applied Ecology IME, have announced a partnership to advance the quality control of human stem cells. Scientists now routinely create »induced pluripotent stem cells«, called iPSCs, which have enormous potential for regenerative medicine, research, and development of new therapeutic agents. To assure that high quality iPSCs are available for research and clinical use, the collaborators are developing rigorous new genomics-based methods to analyze the cells.

iPSCs are made by taking a mature cell, such as a skin cell, and dialing back its developmental programming so it becomes a stem cell, capable of differentiating into virtually any cell type in the body. »Quality control is our major goal,« said Professor Jeanne Loring of TSRI. »We must ensure that the neurons and other cells derived from iPSCs for clinical use and drug discovery are the ideal cell type for the application. As an analogy, imagine the development of a classical drug treatment. The pills that are provided to patients must contain the right amount of the right drug. Our work applies the same quality control principles to stem cells.«

Taking Quality Control to the Next Level

The project is jointly funded by the California Institute for Regenerative Medicine (CIRM) and the German Ministry of Education and Research (BMBF). Loring will receive \$1.8 million for the project in California, and the BMBF will provide matching funds for the German part of the project, for which Franz-Josef Müller (Cluster of Excellence »Inflammation at Interfaces«) is coordinator. The grant will help the team advance a biotechnological tool called »PluriTest«, developed and introduced in 2011 by Loring and Müller, previously at TSRI and now studying neuropsychiatric disorders and inflammation at the ZIP in Germany. The new software will be called »PluriTest2«.

»We will take the next technological step, next generation sequencing, in order to close gaps in stem cell quality control,« said Müller. »In contrast to previous microarray-based technology, we can now see every gene that is expressed in the cell in much more detail. This allows us to draw even more extensive and reliable conclusions on pluripotency, validity of our in vitro models and patient safety.«

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Loring noted the international collaboration is very promising. »The dynamics of international experts working together in a collaborative spirit is inspiring,« she said. »In this case, since our German partners at the Fraunhofer IME are leading experts in the area of early-stage drug discovery, I am especially hopeful that the work will lead to significant scientific insights and progress in new approaches to drug development.«

While patient safety and acceleration of new therapies are strong arguments for optimizing biotechnological tools, Ole Pless of the IME-ScreeningPort also noted the project offers the pharmaceutical sector huge potential savings. »Until now, a lot of money has been burned by high failure rates in drug development,« Pless said. »So we urgently need to improve pre-clinical disease and toxicity models to lower those rates. We need to see earlier on in the process whether we are heading in the right direction with a possible therapeutic agent or not. And we expect that with iPS cells we could considerably enhance the chance of success.«

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About The Scripps Research Institute

The Scripps Research Institute (TSRI) is one of the world's largest independent, not-for-profit organizations focusing on research in the biomedical sciences. TSRI is internationally recognized for its contributions to science and health, including its role in laying the foundation for new treatments for cancer, rheumatoid arthritis, hemophilia, and other diseases. An institution that evolved from the Scripps Metabolic Clinic founded by philanthropist Ellen Browning Scripps in 1924, the institute now employs about 2,700 people on its campuses in La Jolla, CA, and Jupiter, FL, where its renowned scientists – including two Nobel laureates – work toward their next discoveries. The institute's graduate program, which awards PhD degrees in biology and chemistry, ranks among the top ten of its kind in the nation. For more information, see www.scripps.edu.

About the Zentrum für integrative Psychiatrie

The Zentrum für integrative Psychiatrie GmbH (Center for Integrative Psychiatry – ZIP) at the Universitätsklinikum Schleswig-Holstein (UKSH) is the largest university-run psychiatric care and research institution in North Germany. Within its role as a center of maximum care, the ZIP makes a considerable contribution to preserving and restoring the mental health of many people, with over 450 full and part-time inpatient treatment units for those suffering from psychiatric disorders, as well as its affiliated outpatient department.

As a university institution given the task of teaching and research by Kiel University and the Universität zu Lübeck, the central focus at the ZIP is on both basic and applied research. Within the ZIP, professorships at the universities in Kiel and Lübeck are united for Psychiatry and Psychotherapy, as well as for Child and Adolescent Psychiatry. As part of the basic research, the ZIP has been running a lab for molecular and stem cell biology for several decades.

About the Cluster of Excellence »Inflammation at Interfaces«

The Cluster of Excellence »Inflammation at Interfaces« has been promoted since 2007 by the Excellence Initiative of the Federation and the German States with a total budget of 68 million euros; currently, it is in its second phase. The 300 cluster members at four locations in Kiel (Kiel University, University Medical Center Schleswig-Holstein), Lübeck (Universität zu Lübeck, UKSH), Plön (Max-Planck-Institute for Evolutionary Biology) and Borstel (Research Center Borstel - Leibniz-Center for Medicine and Biosciences) conduct research in an innovative, systemic approach to the phenomenon of inflammation, which can invade all barrier organs such as intestines, lungs and skin.

About the Fraunhofer Institute for Molecular Biology and Applied Ecology IME

The Fraunhofer IME conducts research in the field of applied life sciences from a molecular level to entire ecosystems, in the areas of pharmacy, medicine, chemistry, agriculture, as well as environmental and consumer protection. Our mission is the development and use of novel technologies for diagnosis and therapy of human and animal diseases as well as the protection of crop plants and food sources. The IME's interdisciplinary organization features laboratories with state-of-the-art infrastructure, including GMP production facilities and complex facilities for environmental simulations, allowing a wide spectrum of research and development services in the divisions of Molecular Biology and Applied Ecology. We aim at taking innovative products closer towards the market, develop enabling technologies and provide scientific services to partners from academic institutions and industry.

Since 2014 the IME-ScreeningPort with its labs in Hamburg, Germany, is part of the institute. The Fraunhofer IME has approximately 650 employees working at its laboratories in Aachen, Schmallenberg, Münster, Gießen, Hamburg, Frankfurt and its subsidiary research centers in the USA and in Chile.

For more information, see

www.ime.fraunhofer.de/en/businessareasMB/screeningport.html.

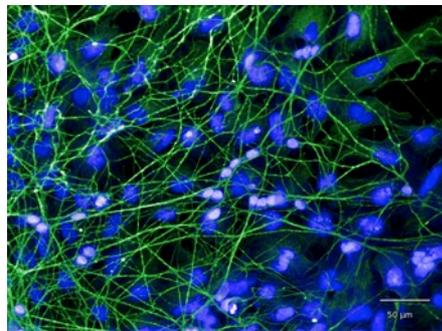
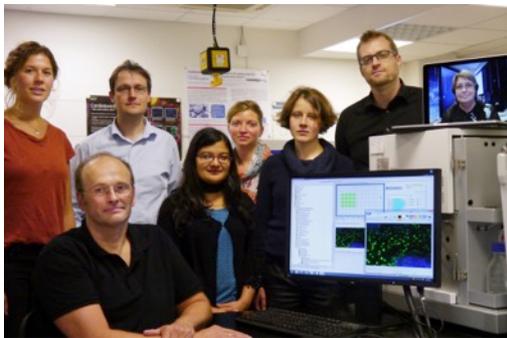
Visit us at BIO-Europe, Munich: Nov 2-4, stall 90.

The IME and ZIP formed in 2013 a strategic alliance in the field of iPS cell technology to transfer basic research findings into application for drug discovery.

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We are happy to provide you with these photos in printing quality – please contact:
Sabine Dzuck: +49 173 304 5723, sabine.dzuck@ime.fraunhofer.de.

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**Group:**

The researcher team around Franz-Josef Müller (back row, 2nd from the left), Ole Pless (on the right) and Jeanne Loring (on the screen).

Cells:

Neurons, stained in green, produced from human iPS cells. Cell nuclei are depicted in blue.

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The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 66 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of nearly 24,000, who work with an annual research budget totaling more than 2 billion euros. Of this sum, around 1.7 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.

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