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Battling infection and resistance

Fraunhofer launches a pioneering collaboration: the German-Australian iCAIR project

These days, even a “simple” infection can become a deadly threat. Bacteria keep developing new resistances to antibiotics, and presenting the international medical community with a significant problem. There is a desperate need for new medications. The biggest hurdle in developing these new medications is getting them from the laboratory and into clinical trials, bridging the gap from the discovery of new agents to their development by the pharmaceutical industry into potential medications. Now researchers from the Fraunhofer Institute for Toxicology and Experimental Medicine ITEM have teamed up with colleagues from the Hannover Medical School (MHH) and Griffith University’s Institute for Glycomics (IfG) in Gold Coast, Australia, in the iCAIR (Fraunhofer International Consortium for Anti-Infective Research) project. They have set themselves the ambitious goal of closing this gap and developing new anti-infective drugs.

“Even in the 21st century, infectious diseases and antibiotic resistance are a global, potentially deadly threat,” says Prof. Reimund Neugebauer, president of the Fraunhofer-Gesellschaft. “Previously effective antibiotics are becoming less and less effective against multi-resistant bacteria. We urgently need to develop new drugs and find new ways to transfer them from research into clinical trials, and that is why Fraunhofer will be redoubling its efforts in this area.” According to the World Health Organization (WHO), lung infections are one of the most common causes of death. The United Nations, WHO, G7 and G20 are calling – with good reason – for renewed efforts to take remedial action and invest in the development of new drugs.

“Medicine needs new treatments to combat infection, and that translates into an urgent need to develop new drugs,” says Prof. Armin Braun, division director of preclinical pharmacology at Fraunhofer ITEM. “High development costs, the likely brief treatment time and the potential for bacterial resistance have been putting companies off, since they are wary of losing money.” One of the biggest obstacles to developing new drugs is what is known as the “valley of death” – the gap in the drug development chain. This hole arises between the discovery of new, potentially beneficial drugs – often by universities or small companies – and the stage at which pharmaceutical companies can do the development work required to make the drugs candidates for

Editorial Notes

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approved treatment. iCAIR is a public domain project that aims to close precisely this gap in the development process.

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A strategic alliance to close the gap in the drug development chain

Fraunhofer ITEM and the MHH in Germany, and the IfG in Australia, have formed a strategic alliance that has set its sights on closing this gap in the drug development chain. As a close-knit research alliance, iCAIR will be working on the development of anti-infective therapies that take new treatment options all the way from the identification of potentially beneficial substances to the preclinical proof of concept. "By pooling the unique and complementary core competencies of the three project partners, we have provided ourselves with the ideal framework for achieving this goal," says Prof. Mark von Itzstein, director of the IfG. "We've got the IfG and the MHH for identifying and profiling treatment agents, the IfG for identifying, designing and optimizing potential drugs, and Fraunhofer ITEM for the preclinical testing of the safety and efficacy of new medications – in other words, all the expertise we need." iCAIR will use selected lighthouse projects to establish and demonstrate its position as an expert preclinical development platform for new anti-infective drugs. One objective of these projects will be to target new treatments to combat infection-causing bacteria and fungi, including *Pseudomonas aeruginosa*, *Neisseria meningitidis* and *Aspergillus fumigatus*, as well as the human parainfluenza and influenza viruses, and develop these treatments to the point of preclinical proof of concept.

New medications from a single source

"iCAIR is responding to society's urgent need for new drugs to combat the increasing threat of uncontrollable infectious diseases," says Prof. Rita Gerardy-Schahn, director of the MHH's Institute for Clinical Biochemistry. "iCAIR is breaking new ground in the development of new drugs with a closely networked system that covers all the steps of a targeted development process, from identifying potential points of attack all the way to drug design and efficacy testing." The development platform established in the iCAIR project will be made available to external partners in addition to its use in proprietary projects. This is geared towards contract research in the pharmaceutical industry as well as small and medium-sized enterprises and publicly funded projects. In the long term, the iCAIR project alliance could lead to a Fraunhofer Project Center and potentially a Fraunhofer Center for new anti-infective drugs.



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Developing new antibiotics, from the first idea to proof of concept. The German-Australian iCAIR project brings together researchers from Fraunhofer ITEM, the MHH in Hannover and Griffith University in Australia.

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