Harnessing Early Science to Develop the Next Generation of Breakthrough Medicines

Discovery portfolio powered by new academic partnerships

Every day, scientists at Boehringer Ingelheim explore ways to achieve our ambition of discovering and developing breakthrough medicines that improve patients’ lives. To help us achieve this ambition, we are working across the global scientific community to power our discovery portfolio. Three new academic partnerships blend external expertise with internal capabilities to explore where science is breaking in hearing loss, cancer and chronic obstructive pulmonary disease (COPD).

The recent World Hearing Day shone a spotlight on the significant and continued unmet medical need of hearing loss – a key focus area for our Research Beyond Borders initiative. The World Health Organization estimates that 360 million people worldwide have disabling hearing loss with a global annual cost of 750 billion US dollars. People with hearing loss usually have degeneration of sensory inner ear hair cells. These do not spontaneously recover and lead to a permanent loss of function. As a result, hearing in the elderly progressively deteriorates over time leading to difficulties in understanding speech and social isolation. Professor Renjie Chai and his team at China Southeast University are among world leaders in this field. Our joint research project aims to develop new treatment approaches through regeneration of hair cells from inner ear stem cells.

“Through this joint project we wish to further promote scientific development in the field of hair cell regeneration, to understand the key pathways needed for regeneration and to accelerate the translation of basic science to clinical applications. The current collaboration will elucidate the regulatory mechanisms of inner ear stem cells, and together with Boehringer Ingelheim we hope to develop these insights into therapeutic compounds to restore hearing loss.” Dr. Wei Xie, Dean of China Southeast University Institute of Life Sciences.

Aiming to tackle some of the most difficult-to-treat cancers, a new research collaboration with Vanderbilt University, Nashville, Tennessee is investigating novel approaches to block KRAS – the Kirstin Rat Sarcoma viral oncogene that is an important driver in lung, colorectal and pancreatic cancers. This multi-year program was set up as a collaboration with Professor Stephen W. Fesik in 2015 and while initiated only a short time ago, it has already achieved two major milestones. Professor Fesik is a pioneer in the discovery of small molecules that bind to and inhibit challenging drug target proteins. The new partnership is focusing on the research and development of small molecule compounds targeting the protein Son of Sevenless (SOS) which is known to activate KRAS.

A research collaboration with Weill Cornell Medicine, New York aims to identify novel treatment approaches that could halt or even reverse lung tissue damage in COPD. This three-year initiative combines Weill Cornell Medicine’s Department of Genetic Medicine’s unique understanding of chronic airway diseases and experience in the investigation of novel therapeutic concepts for airway repair with Boehringer Ingelheim’s expertise in the discovery and development of new therapies for respiratory diseases.

“This new collaboration is an excellent example of our unique partnering approach and our focus on breakthrough innovation. This underscores our ambition to develop the next generation of medical treatments for patients with COPD.” Dr. Clive R. Wood, Senior Corporate Vice President, Discovery Research at Boehringer Ingelheim.

Projects such as the sequencing of the human genome and the Human Microbiome Project are increasing our understanding of biology at an unprecedented rate. Boehringer Ingelheim’s progressive innovation strategy ensures that the Company continuously explores emerging trends so we can remain at the forefront of science and technology. In fact, we are ahead of the curve. In 2013, three years before optogenetics was announced as one of the top 10 emerging technologies of 2016 by the World Economic Forum,1 we established the first of two partnerships with Circuit Therapeutics. Using their innovative optogenetics technology we are working together to identify and characterize drug targets involved in normal and pathological behaviors in CNS diseases. Our second collaboration is investigating metabolic disorders with the aim of developing novel medicines to improve the treatment of obesity and associated diseases.

With a commitment to innovation extending over 130 years, we know that our continued performance depends on two factors: extraordinary science and outstanding scientists. Our own industry-leading scientists are working harder and exploring further each day to push the boundaries of research, and we continue to expand our global community of innovation partners so together we can incubate the most creative ideas and pursue new channels of discovery.

**SHINE – A New Approach to Collaboration from Research Beyond Borders Explores the Microbiome**

Boehringer Ingelheim is exploring one of the new frontiers in life-science discovery with its human microbiome research program. The program, coordinated by our Research Beyond Borders team which aims to identify and explore cutting-edge medical and scientific fields, brings together key experts from the microbiome and immunology scientific communities to work together in a new model of collaboration.

SHINE, a Strategic Hub for Innovative New therapeutics concept Exploration, is a unique postdoctoral research model for academic-industry partnership, designed to maximize engagement with a network of targeted investigators and support their cross-institutional collaboration around a common scientific theme. Most importantly, SHINE brings together complementary skills and expertise to accelerate the drug discovery process, providing greater potential to discover truly novel concepts that can translate into new and advanced medicines for patients.

The SHINE vision is to create a highly synergistic discovery environment by co-locating postdoctoral fellows from leading investigator labs, each focused on complementary and interdependent aspects of complex disease biologies and supporting technologies.

The initial scientific focus of SHINE is the dynamic interplay of the human microbiome and host mucosal immunity at the intestinal epithelial barrier interface in order to improve our understanding of the relevance of the microbiome for human health. Researchers from world-leading institutions, including the Massachusetts Institute of Technology, the Memorial Sloan Kettering Cancer Center, New York University, Washington University in St. Louis and Weill Cornell Medicine New York, are working side-by-side with Boehringer Ingelheim scientists at our research “collaboratory” in Ridgefield, CT, with the aim of establishing the causal effects of the microbiome on certain gut and metabolic disease pathophysiologies.

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“Emerging evidence suggests the gut microbiome has a considerable influence on the development and severity of many diseases. We feel it is essential to bring together the expertise and capabilities of multiple leading investigators with our own scientists to elucidate disease mechanisms and to identify new therapeutic concepts for patient treatment. Our long history of partnering, combined with our expertise in drug discovery and development, provide a strong foundation for success as we explore this new frontier of science.”

Dr. Clive Wood, Senior Corporate Vice President, Discovery Research, Boehringer Ingelheim.
Early Science Beyond Academia – Championing ‘Grass Roots’ Bio-innovators

Beyond the world of academia, we are championing cutting-edge science and emerging technology through our support of entrepreneurs and bio-innovators. Partnerships with early-stage companies often spark some of the most innovative research and development collaborations in the healthcare industry. Our expanding ‘Grass Roots’ program of initiatives connects us with these innovative organizations and facilitates information sharing and an open dialogue.

Recognizing a knowledge and experience ‘gap’ in emerging life-sciences businesses, Boehringer Ingelheim launched its ‘Office Hours’ program in Boston in 2016. Created to provide access to expertise and give an industry perspective and feedback to early-stage organizations, the initiative has mentored over 50 early-stage companies and has expanded to the innovation hubs of New York and San Diego and will soon be launching in London, UK.

For more information on how to apply for Office Hours and the latest dates and locations, please visit https://www.boehringer-ingelheim.com/partnering/value-through-innovation/grass-roots

Supporting the San Diego Innovation Community

Extending the Grass Roots initiatives to the ‘Bio Beach’ innovation community in Southern California earlier this year, we hosted a series of events including the first Office Hours session in San Diego and our Inaugural San Diego Innovation Prize. Our sell-out networking reception, attended by more than 100 bio-innovators, was the venue for the announcement of the first winner of the Innovation Prize in San Diego. RIFT Biotherapeutics, a therapeutic antibody company focused on immuno-oncology targets outside of the T-cell space was the successful entry, winning a ‘Golden Ticket’ for laboratory space at the BioLabs San Diego life-science incubator facility.

“Boehringer Ingelheim recognizes the innovation power of entrepreneurs and bio-innovators to create and sustain pipelines for the next-generation of medicines. Our Innovation Prize is in recognition of the challenges and dedication it takes to start new companies, and we are in constant admiration of innovators willing to take the risk to bring their ideas to market.” Dr. Paola Casarosa, Corporate Vice President, Business Development and Licensing
Strategic Collaboration with Peking University Expands Emerging Science Portfolio

An ambitious partnership with Peking University aims to further advance early-science innovation across a range of areas of high unmet medical need. This long-term partnership will implement a multi-faceted collaboration model that nimbly and flexibly caters for the specific needs of the involved research groups. It will comprise project-based research, a joint post-doctorate fellowship program and a number of Boehringer Ingelheim endowed investigators.

Research teams at Peking University will work closely with their counterparts at Boehringer Ingelheim to leverage the Company's expertise in pharmaceutical research and development with the University's novel approaches and insights to identify novel targets and medicines within and beyond Boehringer Ingelheim's key therapeutic areas. These include cancer, cancer immunology and immune modulation, respiratory, cardiometabolic and central nervous system diseases.

The partnership aims to strengthen the Company's portfolio of early and unique pipeline projects in emerging fields of science and technology, supporting Boehringer Ingelheim's ambition to be at the forefront of science and technology and deliver more first-in-class medicines with breakthrough potential.

“This new collaboration with Boehringer Ingelheim reflects a mutual goal for excellence and providing innovative approaches that bridge the gap between basic science and medical development. We are proud to work with Boehringer Ingelheim to advance knowledge that will benefit patients in China and worldwide.” Jie Wang, Vice President, Peking University, China.

Boehringer Ingelheim sponsors new research building for Vienna’s Institute of Molecular Pathology

Boehringer Ingelheim’s investment in basic science was further demonstrated earlier this year at the opening of the new building of the Institute of Molecular Pathology (IMP) in Vienna. Establishing a life-science facility for the 21st century, the building offers a state-of-the-art framework that can be easily adapted to changing research needs. Two hundred scientists from 40 countries will continue their groundbreaking research here.

Located at the Vienna Biocenter, the IMP is embedded in one of Europe’s largest life-science hubs and has established a reputation as a leading life-science research institute since its foundation more than 30 years ago. Boehringer Ingelheim’s 52 million euro sponsorship of the building ensures the future of the IMP’s innovative world-class research in molecular biology.