Boehringer Ingelheim Intensifies CNS Research with Two New Partnerships

Research partnership with Circuit Therapeutics sets new path in treating psychiatric disorders

A three-year research partnership has recently been announced in which Boehringer Ingelheim and Circuit Therapeutics will work together to discover new ways of treating brain disorders using Circuit’s innovative ‘optogenetics’ technology to allow the identification and characterisation of drug targets involved in normal and pathological behaviours.

Optogenetics involves the genetic introduction of light-sensitive proteins (opsins) into electrically responsive cells, most typically neurons, to allow for light-mediated modulation of cellular activity. The combination of optogenetics and sophisticated molecular technologies provides an unprecedented level of focus to identify novel drug targets and approaches for drug development. The new insights enabled by circuit-based analysis provide fundamentally differentiated approaches to understanding and treating brain disorders, which have otherwise been difficult to address.

“We are excited to work with Boehringer Ingelheim to utilise Circuit’s unique capabilities to advance drug discovery. The innovative and ambitious vision and passion of Boehringer Ingelheim to make a difference in the area of neuropsychiatric disease treatments combined with Circuit’s innovative technologies makes an ideal partnership” commented Fred Moll, Chairman of Circuit Therapeutics.

Worldwide research collaboration announced with Hydra Biosciences

Boehringer Ingelheim’s research, development and commercialisation capabilities were highlighted as key factors in Hydra’s decision to enter into a worldwide collaboration on its small-molecule TRPC4/5 inhibitor programme for the treatment of central nervous system diseases and disorders.

Hydra Biosciences Inc. is a leader in the field of Transient Receptor Potential (TRP) channel modulation. The TRP family of ion channels offers numerous drug discovery opportunities in multiple areas of human disease.

The companies will work together to identify and advance candidate inhibitors with the ultimate goal of providing many patients with debilitating conditions new treatments that offer meaningful therapeutic improvement.

“We are extremely pleased to be working with Boehringer Ingelheim, a company that shares our dedication for developing innovative products that improve patients’ lives. The combination of Hydra’s unique understanding of TRP channels and Boehringer Ingelheim’s proven research, development and commercialisation capabilities provide an excellent opportunity to maximise the potential of these novel targets,” said Russell Herndon, President and CEO of Hydra Biosciences.

CNS disease is just one of the areas that Boehringer Ingelheim is focusing on for new partnering activities. Core therapeutic areas are:

- CardioMetabolic diseases
- Central Nervous System diseases
- Immunology
- Oncology
- Respiratory diseases

For these core areas, partnering activities are focusing on novel therapeutic approaches for drug discovery activities. Beyond the core therapeutic areas, Boehringer Ingelheim is also exploring emerging science and technologies in order to prepare for the innovations of the future.
Boehringer Ingelheim Maintains Industry-leading Investment in R&D

For the fifth successive year, Boehringer Ingelheim maintained an above industry-average commitment to research and development in its prescription medicines business and highlighted the importance of research and development partnerships.

**Boehringer Ingelheim’s partnering commitment**

**Commitment to R&D**
Contributing 22% of net sales across both our own and external projects, Boehringer Ingelheim exceeds the industry average investment in research and development.

**Commitment to external investment**
Partnerships at all stages of the research and development value chain make an important contribution to the Boehringer Ingelheim pipeline. More than 50% of our early-mid stage pipeline is filled with products that are derived from external innovation.

**Commitment to growth**
Boehringer Ingelheim was among the top 10 pharmaceutical companies for growth in 2013 – exceeding the industry average.

**Commitment to you**
Our research and development focus is long term – a commitment that extends just as much to our external partnerships.

**Focus on... Central Nervous System Diseases**

The search for new therapeutic options forms the cornerstone of research and development activities at Boehringer Ingelheim. Current translation of medical science into effective treatments is poor or only partially successful – and never more so than in diseases of the central nervous system.

- 4 million people worldwide live with Parkinson’s disease
- 35 million people worldwide live with Alzheimer’s disease
- 24 million people are affected by schizophrenia
- More than 350 million people of all ages suffer from depression globally

Neurological and psychiatric disorders represent the leading cause of global disease burden in terms of disability-adjusted life years. With the worldwide growth of the elderly population, age-related chronic neurodegenerative diseases such as Alzheimer’s and Parkinson’s diseases are becoming increasingly important challenges for our society. At the same time, critical gaps still exist in the treatment options for mental health disorders such as depression and schizophrenia.

At our research and development centre for CNS Diseases in Biberach, Germany, more than 200 scientists – together with their academic and biotechnology partners – are pursuing novel therapeutic approaches to key unmet medical needs in major neurodegenerative and psychiatric diseases. One focus of our research is the identification of fundamental mechanisms and pathways involved in synaptic dysfunction and maladaptive circuitry as the root cause of various neuropsychiatric symptom domains.

At our Annual Press Conference in April 2014, we were pleased to announce the extension of our research programme in CNS diseases. Building on our experiences, primarily in the indication of Parkinson’s disease, we are now expanding our CNS portfolio to include numerous additional projects in a variety of indications, such as Alzheimer’s disease and schizophrenia.

**Meet the Boehringer Ingelheim Partnering Leadership Team at BIO 2014**

The Boehringer Ingelheim partnering team looks forward to meeting you at the 2014 BIO Convention in San Diego. Members of the partnering leadership team will be available for discussions during the convention at the Boehringer Ingelheim booth (number 6026) located in Exhibit Hall A.

In addition, we invite you to attend our presentation at the BIO Business Forum, during which Dr. Paola Casanova, Corporate Vice President, Therapeutic Alliances and Strategic Partnerships will be highlighting our areas of partnering focus.

**Our Central Nervous System diseases partnering focus**

We are looking for in-licensing and collaboration opportunities in the following areas to include compounds and concepts at all stages, from early drug discovery to Phase 2/clinical proof of concept.

**Alzheimer’s disease**
- Symptomatic treatment, with a clear rationale for superior efficacy to existing drugs
- Disease modification/altering of disease progression, including agents and concepts that target pathogenic forms of Tau or chronic CNS inflammation

**Parkinson’s disease**
- Compounds and concepts with the potential for disease modification, including those that target pathogenic forms of alpha-synuclein or chronic CNS inflammation

**Schizophrenia**
- Pharmacologic approaches for treating negative symptoms and/or cognitive impairment

**Depression**
- Pharmacologic approaches targeting novel pathways beyond monoamine neurotransmission (including e.g. modulators of the glutamategic system) for: 
  - rapid onset of antidepressant action
  - adjunctive treatment of patients with treatment-resistant depression
New Research Partnership with Connexios Life Sciences Explores New Avenues in Type 2 Diabetes

It is estimated that more than 300 million people around the world have type 2 diabetes. While great therapeutic advances have been made, many patients’ blood glucose levels remains uncontrolled, thereby increasing their risk of both microvascular and macrovascular complications. Exploring new therapeutic avenues facilitates a better understanding of the underlying causes of the disease with the potential of delivering treatments that can address the remaining unmet medical need.

This new research collaboration with Connexios Life Sciences, addresses this by exploring potential new mechanisms of action.

AMP-activated protein kinase (AMPK) is a systemic regulator of cellular energy homeostasis, coordinating anabolic and catabolic processes in glucose and lipid metabolism. AMPK activation is thought to result in glucose regulation with significant cardio-protective benefit, thereby improving whole body insulin sensitivity with anti-obesity and systemic anti-inflammatory benefits. It is hoped that the collaboration will yield best-in-class activators of this target and ultimately result in better therapies for patients with type 2 diabetes.

The partnering team at Boehringer Ingelheim is pleased to introduce its new branding "Working together for better health" in this edition of our newsletter.

Partnering is a key pillar of our prescriptions medicine business and we are committed to expanding our global network of academic and industry partners so together we can contribute to advancing science and develop better therapies for patients. With a research focus that is long-term, and which extends equally to our relationships with our partners, we believe that working together for better health succinctly defines our partnering ethos. It combines a tangible description of what we do every day with our partners – Working together – with our aspiration for what we seek to achieve through this – better health.

We hope you agree and look forward to working together for better health.