Addressing the Global Challenge of Mental Illness with Expanding Portfolio of Innovation in CNS Diseases

Boehringer Ingelheim announces new partnerships to advance research in schizophrenia

Schizophrenia affects more than 20 million people worldwide. While treatments are available that can help with some symptoms, the complex manifestation of the disease means there is an urgent need for more effective and better-tolerated therapies. Boehringer Ingelheim’s new partnerships seek to explore the biology behind the symptoms which may lead to the identification of new compounds and ultimately new treatments for this often severe and disabling disorder.

A research collaboration and licensing agreement with Arena Pharmaceuticals aims to identify drug candidates targeting an undisclosed G protein-coupled receptor (GPCR) which belongs to the group of orphan CNS receptors. An orphan receptor is structurally related to a family of proteins that are known to act as functional cell-surface receptors but whose ligand has not yet been identified.

“Collaborations are an essential part of our drug discovery and development efforts, so we are pleased to be part of this shared goal to identify novel drugs targeting an orphan CNS receptor with Boehringer Ingelheim, who possesses demonstrated capabilities in research, development, manufacturing and marketing of pharmaceutical products”. Harry F. Hixson, Jr., Interim Chief Executive Officer, Arena Pharmaceuticals.

Aiming to generate lead structures for symptom domains affected in schizophrenia, the Lead Discovery Center (LDC), Max Planck Innovation and Boehringer Ingelheim have signed an agreement providing Boehringer Ingelheim with the option to receive the exclusive rights to a new lead compound for the treatment of schizophrenia to be discovered and developed at the LDC.

The novel approach builds on ground-breaking research results from Prof. Moritz Rossner and his team at the Max Planck Institute of Experimental Medicine in Göttingen. Now a professor at the Ludwig Maximilian University of Munich, Prof. Rossner is also co-founder of Systasy Bioscience. He will work closely with the LDC team to identify and optimize novel compounds with strong therapeutic potential and develop them further to the stage of a validated pharmaceutical lead with in vivo efficacy. In this early discovery project Boehringer Ingelheim will take a seat on the project development team. In addition, the Company will allocate internal resources to the program and support collaborating partners to strengthen the early development work.

Building on Boehringer Ingelheim’s recent collaboration with BioMed X, a second project seeks to generate novel therapeutic concepts for psychiatric diseases by developing a highly integrated brain microcircuit model that includes neurons and non-neuronal cells. Michał Ślęzak from the Flanders Institute for Biotechnology in Leuven, Belgium, has been appointed to lead an interdisciplinary team who will use state-of-the-art technologies to model brain microcircuits at unprecedented complexity.

These new partnerships extend the already successful research and development franchise in CNS diseases and, together with the established partnerships of Circuit Therapeutics and Hydra Biosciences, create a portfolio of external partnerships that set the stage for continued success.

Focus on... Central Nervous System Diseases

The World Health Organization (WHO) estimates that more than 470 million people worldwide are affected by mental illnesses. At a recent two-day event co-hosted by the World Bank and the WHO, governments, business leaders and innovators were urged to move mental health from the margins to the mainstream.

Boehringer Ingelheim is already ahead of the curve and mobilizing governments, business leaders and innovators were urged to move for a neurobiology-driven model, which recognizes key symptom domains. The World Health Organization (WHO) estimates that more than 470 million people worldwide are affected by mental illnesses.

KM: Our ‘sweet spot’ for partnering is projects between lead optimization and clinical Phase 1. We have found that programs that are partnered at this early stage benefit from the respective strengths of the academic/biotech partner and Boehringer Ingelheim and are therefore better placed to succeed. Our recent partnerships with Hydra Biosciences and Arena are good examples of this.

Our Central Nervous System Diseases Partners

- **2013**, Research partnership to discover new targets for treating brain disorders using Circuit’s innovative optogenetic technology.
- **2014**, Research collaboration on Hydra’s small molecule TRPC4/5 inhibitor program for the treatment of CNS diseases.
- **2016**, Research collaboration and licensing agreement to identify drug candidates targeting an undisclosed GPCR which belongs to the group of orphan receptors.

KM: We observe that in a rapidly-moving scientific eco-system new thinking is emerging on an almost daily basis. Our increased focus on collaborations with external partners reflects this. Moreover, our ability to access the vast creative pool of global biomedical research through external collaborations is already bearing fruit in the neuroscience area.

BS: A good illustration of this is our partnership with Circuit Therapeutics. Using their ground-breaking optogenetic technology to identify and characterize drug targets involved in normal and pathological behaviors demonstrates how early-stage partnership with innovation leaders has the potential to set a new path in treating mental illness.

In our efforts to increase our response to the challenge of mental illness, what kinds of projects are you looking to capture in future collaborations with partners?

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BS: Our specific interests include novel approaches which modulate signaling pathways involved in synaptic dysfunction and/or maladaptive brain circuitry as the root cause of various neuropsychiatric symptom domains. In addition to compound-related programs we invite proposals from potential partners who can help us build knowledge and contribute to science in these areas so we can work together to improve mental health around the world.

In the Spotlight: Boehringer Ingelheim Supports Nature Outlook Supplement on Open Innovation

Nature Outlook: Open Innovation, published in the 12th May Issue of Nature and freely available online, has been supported by Boehringer Ingelheim. This edition of Nature Outlook includes a white paper (click here) from Boehringer Ingelheim that describes the Company’s open innovation strategy. With 11 launches in major markets in 2014 and 2015, and four of its drug candidates receiving FDA breakthrough therapy designation, Boehringer Ingelheim has a demonstrable track record of innovation both from its own research portfolio as well as from projects with its partners. Its open innovation program is further evidence of Boehringer Ingelheim’s commitment to pursue innovation wherever it occurs.

In the publication, Boehringer Ingelheim champions the concept of open innovation and its essential role in the discovery of new medicines, outlining the Company’s definition of open innovation as “the process of innovating with others outside of our organization to create new medicines of the future.” Boehringer Ingelheim recognizes that its own success is dependent on its ability to access innovative ideas for new therapeutic approaches and disease mechanisms, and to combine these with its proven internal strengths in drug discovery and development.

Consequently, the organization has recently redefined its Discovery Research strategy to foster a greater culture of innovation and enhance and expand its ability to access breakthrough science from around the world more effectively. This strategy is based on three guiding principles: building on the Company’s existing strengths; creating synergies; and capturing emerging science.

To access the recent Nature Outlook supplement please visit www.nature.com/nature/outlook/open-innovation.

New Global Collaboration with AbbVie Aims to Provide Best-in-Class Treatment in Psoriasis

Boehringer Ingelheim and AbbVie have announced a global collaboration to develop and commercialize risankizumab (BI 655066), an anti-IL-23 monoclonal bispecific antibody, currently in Phase 3 development for psoriasis. This promising compound has the potential to become the best-in-class treatment in psoriasis having demonstrated greater efficacy over ustekinumab in Phase 2 clinical studies. Risankizumab is also being evaluated in Crohn’s disease, psoriatic arthritis and asthma.

Michael E. Seowin, M.D., Executive Vice President and Chief Scientific Officer, AbbVie: “This collaboration positions BI 655066 as AbbVie’s lead investigational compound in psoriasis, complementing our robust immunology pipeline. Our expertise in developing and commercializing the world’s leading biologic, combined with Boehringer Ingelheim’s clinical success to-date will enable us to offer patients a new treatment option with the potential to meaningfully improve the standard of care.”

Boehringer Ingelheim and AbbVie belong to the group of orphan receptors.


Reference: Nature Outlook Supplement as part of Nature Volume 533, Issue 7602 (12 May 2016)

Recent Phase 2 head-to-head study results in patients with moderate-to-severe plaque psoriasis showed that risankizumab had greater efficacy over ustekinumab, a commonly used treatment for this life-impacting skin condition.

AbbVie will also gain rights to a second compound, BI 655064, an anti-CD-60 antibody, which is currently in Phase 1 development. The CD40-CD40L pathway may play a major role in immune disease such as lupus nephritis, Crohn’s disease and ulcerative colitis.

Commenting on this collaboration Dr. Michel Pairet, Member of the Board of Managing Directors responsible for R&D nonclinical at Boehringer Ingelheim said “Our Immunology R&D teams have successfully brought forward compounds that have the potential to transform the way immune diseases are treated. I believe the collaboration with AbbVie is the best way to ensure broad access for patients to risankizumab and BI 655064. Our company remains strongly committed to establishing immunology as a core area of expertise and building our pipeline and capabilities in this important therapeutic area.”
Bridging the Gap Between Pharma and Next-Generation Biotech

As home to more than 700 life-science organizations, the Boston ‘super-cluster’ is one of the world’s leading centers for innovation. And with a record two billion dollars of venture capital investment in Massachusetts’ biotech companies in 2015, the next generation of innovators is providing significant fuel to drive the research and development engine.

As part of its strategy to increase its ‘grass roots’ level partnering initiatives, Boehringer Ingelheim is supporting emerging science and technology through championing early-stage entrepreneurs. This has been manifested in its recent sponsorship of LabCentral in Boston. Designed as a ‘launch pad’ for high-potential life-sciences and biotech start-ups, LabCentral is a shared laboratory and office space facility for up to 30 start-ups comprising approximately 125 scientists and entrepreneurs.

Recognizing a knowledge and experience ‘gap’ in these entrepreneurial organizations, Boehringer Ingelheim has launched a distinctive mentoring initiative designed to provide access to expertise and give an industry perspective and feedback to these embryonic businesses.

The ‘Office Hours’ program is designed as a consultative ‘round table’ meeting facilitating the exchange of expertise from senior professionals within the Boehringer Ingelheim organization.

Participating companies are invited to submit five questions in advance so the sessions can be tailored to meet individual needs. Early feedback has been extremely positive.

"As a small biotech company, being able to get feedback, advice, and mentorship through the BI Office Hours program has been incredibly valuable. Their expertise and input from both a scientific and business perspective have helped shape our R&D and business strategies." Rathi Srinvas, Co-Founder, Novopyxis.

In a second initiative, the inaugural Boehringer Ingelheim ‘Academy’ at LabCentral responded to the insight that growing companies and pharma often speak different languages when it comes to transacting a deal. Taking the form of a panel discussion involving business development leaders from Boehringer Ingelheim and perspectives from some of their partners, this interactive session went behind the boardroom door to discuss how deals are transacted from search and evaluation through business development, term sheet development, negotiations and execution. Future sessions will explore different themes of interest to this important group of potential future partners.

"Increasing our presence in innovation hubs is an important part of our new R&D strategy. We are extremely proud to be supporting the next generation of biotech companies and entrepreneurs in Boston through initiatives such as Office Hours and the Boehringer Ingelheim Academy and we look forward to extending these programs to other innovation hubs." Dr. Paola Casarosa, Corporate Vice President, Business Development and Licensing, Prescription Medicines.