Imanova Ltd.

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Bridging the CNS translational gap one image at a time

Imanova helps companies accelerate their drug development programs by providing imaging tools for de-risking lead compounds early in humans, thereby reducing late-stage attrition.

Imaging technologies have long had a key role in biomedical research and clinical diagnostics. Because of its noninvasive nature and exquisite sensitivity, molecular imaging is of particular relevance when it comes to translational science and validation of new targets in both preclinical disease models and human clinical trials.

A number of technologies, such as magnetic resonance imaging (MRI), positron-emission tomography (PET) and computed tomography (CT), have provided researchers and clinicians with powerful, noninvasive means to look inside the human body using a range of spatial and temporal scales. Although each of these technologies on its own generates useful data, the integration of information from two or more modalities provides invaluable information on drug-target interactions and possible pharmacological responses. However, accomplishing this integration has proven technically challenging, and thus biomedical imaging has yet to reach its full potential.

Established in 2011, translational imaging company Imanova has become a global leader in the development of processes to help address this technological challenge for research purposes. With its deep-rooted expertise in radiochemistry, PET and MRI, the organization is uniquely positioned to accelerate innovation in imaging sciences—from radiotracer design and biomarker validation to the integrated analysis of information from multiple platforms—to support the drug development programs of its partners all the way from preclinical research to clinical studies.

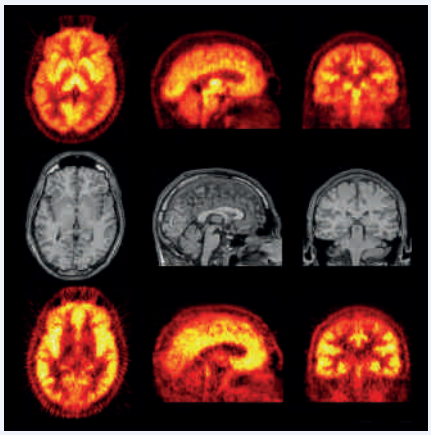

Figure 1: Positron emission tomography (PET) and magnetic resonance (MRI) images of the human brain. PET images of important serotonergic proteins involved in synaptic neurotransmission are shown with [11C] WAY100635 a marker of 5-HTs1A receptors (top) and [11C]DASB a marker of the serotonin transporter (bottom). The middle images shows a structural T1 MRI image. Each row contains three orthogonal slices through the brain of the same individual.

"A well-designed imaging study saves time and cost," said Imanova CEO Kevin Cox. "For example, molecular imaging provides early information in man that de-risks decision making and can help make early clinical trials shorter, smaller and more targeted, bringing drugs to the market more quickly and more cost-effectively."

Imanova has built an extensive catalogue and strong pipeline of imaging biomarkers in partnership with academic and industrial organizations and has developed a range of integrated imaging services for clients in the translational science space. At this point, the company is interested in identifying new opportunities to in-license compounds to expand its portfolio of imaging ligands, and to further move beyond the brain.

Informed decision making for CNS therapies

Imanova has developed world-leading capabilities in the application of PET for preclinical and clinical target evaluation. Combined with MRI, PET allows the company to address the main pillars on which the potential success of a lead compound rests: tissue penetration, target engagement and pharmacological response.

With PET, a trace compound labeled with a positron-emitting radioisotope can be detected while bound to its target, which allows researchers to determine the exact location of the compound in the subject, as well as quantitative aspects such as its pharmacokinetics. This makes PET a crucial tool for visualizing drug-target interactions in humans early in the drug development process, often at the same time as first-in-human and early patient trials. Thus, it is an ideal approach for experimental medicine.

This ability to directly bridge the preclinical and clinical spaces makes PET a powerful tool for translational science. By providing key information on drug penetration and engagement, optimal dose selection, and the relationship between target and disease in humans, PET helps accelerate new therapeutic concepts into actual treatments.

Imanova has established a PET-tracer development service, dubbed *i*-biomarker, to provide industrial and academic partners with a seamless solution for the development of new molecular imaging biomarkers for use in disease research and drug development for a range of therapeutic indications.

The company is using *i*-biomarker to create a pipeline of broadly applicable tracers, but it is also positioning this service to allow collaborations with institutions and pharma partners on the development of specific biomarkers of interest, often from pharma compound libraries, for novel indications.

To date, Imanova has developed and implemented over 17 *i*-biomarkers to good manufacturing practice (GMP) standard and is looking to in-license new leads. In addition to CNS diseases, other key therapeutic areas are candidates for *i*-biomarker development, including oncology, inflammatory disorders and respiratory diseases.

Imaging partnerships

Working to facilitate the translation of academic research into commercial drug development, Imanova brings together under one roof a breadth of world-class capabilities to advance imaging research in support of both academic and industrial partners. The company is looking to further expand its biomarker lead portfolio.

Strong partnerships with academic collaborators such as Imperial College London, King's College London and University College London, three of the company's co-owners, provide access not only to scientific excellence, new ideas and innovative concepts but also to diverse and well-characterized patient populations for drug development.

By providing a comprehensive suite of imaging-based solutions, Imanova is driving imaging research to new levels, with a focus on intelligent and flexible study designs that can deliver quantitative endpoints. Cox explained, "We help clients make data-driven decisions and by making imaging an integral part of the research process we can help accelerate advances in CNS drug development, and shape a collaborative ecosystem in imaging and biomarker research to the benefit of all."

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