First AI-Based Tool for Predicting Genomic Subtypes of Pancreatic Cancer (PDAC) from Histology Slides Shared at ASCO 2021: More groundbreaking science from a fruitful AP-HP Greater Paris University Hospitals and Owkin collaboration

Paris, France and New York, NY June 10, 2021 – AP-HP Greater Paris University Hospitals, the leading European clinical trial center with the largest amount of healthcare data in France dedicated to research and Owkin, a startup pioneering Federated Learning and AI technologies for medical research and clinical development, announced the recent results of their ongoing strategic collaboration at ASCO 2021. The abstract and poster entitled “Identification of pancreatic adenocarcinoma molecular subtypes on histology slides using deep learning models” demonstrates the first AI-based tool for predicting genomic subtypes of pancreatic cancer (PDAC) developed from machine learning applied to histology slides. The tool, a trained and validated AI model, is usable in clinical practice worldwide and opens the possibility of patient molecular stratification in routine care and for clinical trials.

Gilles Wainrib, Chief Scientific Officer and Co-Founder of Owkin said:
“Our research shows AI can help connect information at the genomic, cellular and tissue levels, and how doing so can bring immediate value to make precision medicine a reality for patients. This study further underscores the value of using machine learning for identifying histo-genomic signals for cancer research and clinical development.”

Pancreatic adenocarcinoma is a complex and heterogeneous disease. Improvement of prognosis has stalled while pancreatic cancer is predicted to become the second most lethal cancer by the year 2030. Heterogeneity and tumor plasticity are likely major factors in the failure of many clinical trials. Multiomics studies have revealed two main tumor transcriptomic subtypes, Basal-like and Classical that have been proposed to be predictive of patient response to first line chemotherapy. The determination of these subtypes has been possible so far by RNA sequencing, a costly and complex technique that is not yet feasible in a clinical routine setting. Taken together, these factors make it compelling to use advanced AI methods with common histological slides, trained alongside crucial context from expert researchers, to address the unmet needs of patients.

Pr Jérôme Cros, Pathologist at Beaujon Hospital – Université de Paris said:
“This tool was developed using the unique histological and molecular resources from four APHP hospitals (Amboise Paré–Beaujon-Pitié Salpêtrière–Saint Antoine) though a unique collaboration between pathologists from APHP, bioinformaticians from the group Carte d’Identité des Tumeurs de la Ligue Contre le Cancer and data scientists from Owkin. It can remotely subtype tumor in minutes paving the way for many applications from basic science (study of intra-tumor heterogeneity) to clinical practice (tumor subtyping in clinical trials).”

This research is born out of a successful and ongoing collaboration between Owkin’s multidisciplinary teams and those of the AP-HP Greater Paris University Hospitals. Since 2019, the two have collaborated in the service of shared objectives: 1) to improve patient care and facilitate the develop-
ment of new drugs in three main areas (oncology, immunology, cardiology), 2) to democratize access to AI for researchers in order to promote innovation and medical advances.

**ASCO 2021 Science Yielded from an Ongoing Fruitful Research Collaboration**

This most recent scientific achievement comes on the heels of several other publications. Recently, in January 2021, AP-HP Greater Paris University Hospitals and Owkin published an AI-Severity score for Covid-19 patients using CT scans alongside other data modalities in *Nature Communications*. This project, the collaborative output of a consortium also including INRIA/CentraleSupélec and Gustave Roussy, was achieved in record time due to the close coordination and established framework agreement between AP-HP Greater Paris University Hospitals and Owkin. The result: the AI-Severity score has been shown to outperform other scores currently in use and demonstrates that effective collaborations such as these can quickly derive research findings with direct clinical utility.

In August of 2020, Owkin published its novel predictive AI tool for RNA-seq expression from whole slide images (HE2RNA) in *Nature Communications*—one of the top 50 most widely read papers of 2020 in said journal. These findings were born out of close collaboration with Prof. Julien Calderaro (anatomo-cyto-pathologist at Henri-Mondor hospital, AP-HP). This tool can be deployed to all types of cancer and laid the groundwork for the histo-transcriptomic findings of the recent Pancreatic Adenocarcinoma tool.

Other notable research from this collaboration includes a paper on AI prediction of survival for patients with hepatocellular carcinoma published with Prof. Julien Calderaro in *Hepatology* in February 2020 and a comparison of classification methods of Crohn’s disease with machine learning models, published in July 2019, led by Prof. Jean-Pierre Hugot (pediatrician at Robert Debré hospital, AP-HP).

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**About Owkin:**

Owkin is a French-American startup that specializes in AI and Federated Learning for medical research. Its multidisciplinary team of 100 people has expertise in analyzing real-world data and leveraging advanced machine learning technologies on multimodal cohorts. It was co-founded in 2016 by Dr. Thomas Clozel M.D., a clinical research doctor and former assistant professor in clinical hematology, and Dr. Gilles Wainrib, Ph.D., a pioneer in the field of artificial intelligence in biology.

Owkin leverages life science and machine learning expertise to make drug development and clinical trial design both more targeted and more cost-effective. Owkin applies its cutting-edge machine learning algorithms across a broad network of academic medical centers, creating dynamic models that can not only predict disease evolution and treatment outcomes, but also be used in clinical trials for enhanced analysis, high-value subgroup identification, identification of novel biomarkers, and the creation of both synthetic control arms and surrogate endpoints. The end result? Better treatments for patients, developed faster, and at a lower cost.

To train its models, Owkin collaborates with top-tier hospitals to develop a real-world data access network. This network represents the first-ever at-scale and on-site solution for federated machine learning in the healthcare industry. Through this network, Owkin can interrogate heterogeneous real-world data hand-in-hand with world-class clinicians to interpret model features and discover and validate novel multimodal biomarkers, all while preserving patient privacy.
About AP-HP Greater Paris University Hospitals:

The leading hospital and university center (CHU) in Europe, the AP-HP and its 39 hospitals are organized into six university hospital groups (AP-HP Center - University of Paris; AP-HP Sorbonne University; AP-HP North - University of Paris; AP-HP Paris Saclay University; AP-HP Henri Mondor and AP-HP University Hospitals, Paris Seine-Saint-Denis University Hospitals) and are organized around five universities in the Île-de-France region. Closely linked to major research organizations, the AP-HP has three world-class hospital-university institutes (Institut du Cerveau, ICAN, IMAGINE) and the largest French health data warehouse (EDS). A major player in applied research and innovation in health, AP-HP holds a portfolio of 650 active patents, its clinician-researchers sign nearly 9,000 scientific publications each year and more than 4,000 research projects are currently under development, all promoters combined. In 2020, AP-HP obtained the Institut Carnot label, which rewards the quality of research partnership: Carnot @ AP-HP offers industrial players solutions in applied and clinical research in the health sector. The AP-HP also created in 2015 the AP-HP Foundation for Research to support biomedical and health research carried out in all of its hospitals. http://www.aphp.fr