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**DANA-FARBER CANCER INSTITUTE AND ASTELLAS ANNOUNCE
RESEARCH COLLABORATION**

Focus on research and development for small molecule inhibitors of oncogenic K-Ras— the most commonly mutated oncogene in human cancers

BOSTON and TOKYO, JAPAN – Nov. 4th, 2014 – [Dana-Farber Cancer Institute](#) (Dana-Farber) and [Astellas Pharma Inc.](#) (Tokyo: 4503) today announced a three-year collaboration to research and develop small molecule inhibitors of oncogenic K-Ras for the treatment of cancer, including lung cancer. K-Ras is the most commonly mutated oncogene in human cancers, with about 30% of all cancers harbouring activating *ras* mutations. Furthermore, cancers with a high prevalence of K-Ras mutations, such as lung cancer and pancreatic cancer, are difficult to treat and clinical outcomes are poor even with aggressive medical interventions. Despite more than 20 years of research by industry and academia, K-Ras has proven highly difficult to target and no effective therapy currently exists.

[Nathanael Gray](#), Ph.D., of the Cancer Biology Department at Dana-Farber and professor at Harvard Medical School, will lead this collaborative research. In collaboration with other Dana-Farber investigators, Dr. Gray published an article about a novel approach to developing inhibitors to the G12C mutation of K-Ras earlier this year (“Therapeutic Targeting of Oncogenic K-Ras by a Covalent Catalytic Site Inhibitor”¹) and detailed the inhibitor’s structural interaction with the K-Ras target in a second publication in June (“In situ Selectivity Profiling and Crystal Structure of SML-8-73-1, An Active Site Inhibitor of Oncogenic KRas G12C”²). In addition to providing critical research support, Astellas has an option to obtain from Dana-Farber an exclusive, worldwide license to novel K-Ras inhibitors obtained from the research collaboration, and upon exercise of the option, would conduct further preclinical research and development on such K-Ras inhibitors, and subsequent clinical development and commercialization.

“Our work opens up a new approach to developing K-Ras inhibitors,” said Gray. “We are excited to work with a top-tier pharmaceutical company committed to innovative oncology

¹ Lim SM, Westover KD, Ficarro SB, Harrison RA, Choi HG, Pacold ME, Carrasco M, Hunter J, Kim ND, Xie T, Sim T, Jänne PA, Meyerson M, Marto JA, Engen JR, Gray NS. *Angew Chem Int Ed Engl.* 2014 Jan 3;53(1):199-204. doi: 10.1002/anie.201307387. Epub 2013 Nov 20. PMID:24259466

² Hunter JC, Gurbani D, Ficarro SB, Carrasco MA, Lim SM, Choi HG, Xie T, Marto JA, Chen Z, Gray NS, Westover KD. *Proc Natl Acad Sci U S A.* 2014 Jun 17;111(24):8895-900. doi: 10.1073/pnas.1404639111. Epub 2014 Jun 2. PMID: 24889603

research on this collaboration, and to develop novel inhibitors to this molecular target that have thus far been inaccessible,” he added.

“We are pursuing open innovation in drug discovery and are looking for new drug discovery opportunities that satisfy unmet medical needs through collaboration with external partners,” said Kenji Yasukawa, Ph.D., Senior Vice President and Chief Strategy Officer, Astellas Pharma Inc. “This collaboration with Dana-Farber perfectly illustrates this strategy and it is our hope that this collaboration to advance drug discovery will bring innovative cancer treatments to patients around the world.”

In this collaboration, Dr. Gray’s laboratory and the Dana-Farber Medicinal Chemistry Core will be joined by the laboratories of [Pasi A. Jänne](#), M.D., Ph.D., and [Kwok-Kin Wong](#), M.D., Ph.D. of the Thoracic Oncology Program and co-directors of the Belfer Institute for Applied Cancer Science at Dana-Farber and Professors at Harvard Medical School.

“This is a population of cancer patients for whom current therapeutic approaches are limited. We are excited at the opportunity to work collaboratively with Astellas in an effort to develop a new approach to treating K-Ras mutant cancers,” said Jänne. “Our collective expertise in clinical need, basic biology, mouse models and screening/medicinal chemistry should help make this a productive collaboration.”

This collaboration is being led by Innovation Management (“AIM”) of Astellas Pharma Inc.

About Dana-Farber Cancer Institute

[Dana-Farber Cancer Institute](#), a principal teaching affiliate of Harvard Medical School, is world-renowned for its leadership in adult and pediatric cancer treatment and research. Designated as a comprehensive cancer center by the National Cancer Institute (NCI), it is one of the largest recipients among independent hospitals of NCI and National Institutes of Health grant funding. For more information, go to www.dana-farber.org.

About Astellas Pharma Inc.

Astellas Pharma Inc., located in Tokyo, Japan, is a pharmaceutical company dedicated to improving the health of people around the world through the provision of innovative and reliable pharmaceuticals. Astellas has approximately 18,000 employees worldwide. The organization is committed to becoming a global category leader in Urology, Immunology (including Transplantation) and Infectious diseases, Oncology, Neuroscience and Diabetes Mellitus (DM) Complications and Kidney diseases. For more information on Astellas Pharma Inc., please visit our website at www.astellas.com/en.

About Innovation Management

Innovation Management (“AIM”) is a new division established in October 2013 to enhance and accelerate the process of screening and acquiring external opportunities to strengthen innovation at the preclinical development stage. AIM oversees strategic alliance activities with external partners and is responsible for a series of activities at acquiring external innovation opportunities in the preclinical development stage, such as strategy planning, screening, scientific assessment and alliance negotiations, so that strategic external business alliances can be strategically and systematically performed.

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