Press Release

Astellas is Awarded Grant from the U.S. National Institutes of Health (NIH) to Fund Early Clinical Studies of ASP8062 to Investigate Potential Novel Therapeutic Approach to Address the Opioid Crisis

TOKYO, July 22, 2020 – Astellas Pharma Inc. (TSE: 4503, President and CEO: Kenji Yasukawa, Ph.D., "Astellas") today announced it has been awarded a grant from the National Institute on Drug Abuse (NIDA), part of the National Institutes of Health (NIH) in the U.S. to help fund two phase 1 clinical studies to evaluate the safety and efficacy of ASP8062, an oral small molecule $GABA_B$ receptor Positive Allosteric Modulator (PAM), as an add-on maintenance therapy for Opioid Use Disorder (OUD).

With the loss of over 46,802 American lives in 2018 due to overdose of an opioid[1], the U.S. federal government declared the opioid crisis a national Public Health Emergency under federal law in October 2017[2]. The grant is part of the Helping to End Addiction Long-term℠ Initiative, or NIH HEAL Initiative℠, an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. The NIH HEAL Initiative℠ will accelerate the development of novel medications and devices to treat all aspects of the opioid addiction cycle, including progression to chronic use, withdrawal symptoms, craving, relapse, and overdose.

Astellas has continued research and development to explore new therapeutic possibilities for the opioid crisis and submitted the grant application based on supportive preclinical studies utilizing ASP8062 in various models of substances of abuse, such as the self-administration reduction effect of opioids by ASP8062. These data are highly consistent with other scientific literature which led NIDA to identify ASP8062's mechanism of action, $GABA_B$ PAM, as one of the 'ten most wanted' pharmacological mechanisms for treatment of Opioid Use Disorder[3]. PAM compounds are considered promising therapeutic advances with the potential to improve clinical outcomes for the future by reducing self-administration and drug-seeking behavior, based on their potential ability to positively modulate the effects of endogenous agonists but without many of the side effects commonly associated with direct acting agonists[4, 5].

Formal approval and funding from NIDA for the phase 1 clinical study program was granted following the opening of an Investigational New Drug (IND) application by the FDA for ASP8062 in OUD in April 2020. Should the phase 1 studies demonstrate appropriate safety measures, a second phase of the grant may be awarded to help fund a randomized double-blind phase 2 study to assess the safety and efficacy of ASP8062 on the reduction of opioid use in OUD patients on stable buprenorphine-based (BUP) therapy.

“This is an early, but important, step in identifying a potential new approach to tackle the ever-growing opioid crisis,” said Salim Mujais, M.D., Senior Vice President and Therapeutic Area Head, Medical Specialties, Astellas. “Astellas recognizes the serious burden of OUD on patients, their families, and caregivers along with its tragic impact across the world. We are pleased that NIDA has awarded this grant to Astellas to support research of ASP8062,” he continued. “We hope to be able to contribute to the NIH strategy to identify scientific solutions and novel pharmacotherapies to deliver new treatment options for patients battling opioid addiction.”

The grant builds upon Astellas’ long-standing commitment to improving access to health, particularly for the most pressing health concerns, by leveraging its strength and technologies and seeking out unique partnerships to collaboratively address areas of greatest need.

About ASP8062 and Next Phase Clinical Trials

Early studies have shown that the $GABA_B$ receptor is involved with reducing self-administration and drug-seeking behavior across several substances of abuse (i.e., opioids, alcohol, cocaine and nicotine etc.) by suppressing dopamine release from key areas of the brain. ASP8062 has not yet been studied in the clinic as an OUD treatment. Through NIDA’s funding, two phase 1 studies will be conducted consisting of ASP8062 in combination with BUP-based therapy and then with morphine to evaluate if ASP8062 can be safely used in an OUD clinical setting. In a potential second phase of the grant award, a randomized double-blind phase 2 study would assess the efficacy of ASP8062 on the reduction of opioid use in OUD patients on stable BUP therapy.

About the NIH HEAL Initiative℠ Strategy

In recognition of the critical role of science in developing new therapies to address the epidemic, the NIH HEAL Initiative℠ strategy aims to accelerate scientific solutions to address the opioid crisis – doubling the funding available for research on opioid misuse, addiction and pain. The medical component of the NIDA-led research projects and funding includes aiding the development of novel pharmacotherapies for the treatment of opioid overdose and OUD[1].

About Astellas

Astellas Pharma Inc., is a pharmaceutical company conducting business in more than 70 countries around the world. We are promoting the Focus Area Approach that is designed to identify opportunities for the continuous creation of new drugs to address diseases with high unmet medical needs by focusing on Biology and Modality. Furthermore, we are also looking beyond our foundational Rx focus to create Rx+® healthcare solutions combine our expertise and knowledge with cutting-edge technology in different fields of external partners. Through these efforts, Astellas stands on the forefront of healthcare change to turn

innovative science into value for patients. For more information, please visit our website at https://www.astellas.com/en

Cautionary Notes

In this press release, statements made with respect to current plans, estimates, strategies and beliefs and other statements that are not historical facts are forward-looking statements about the future performance of Astellas. These statements are based on management's current assumptions and beliefs in light of the information currently available to it and involve known and unknown risks and uncertainties. A number of factors could cause actual results to differ materially from those discussed in the forward-looking statements. Such factors include, but are not limited to: (i) changes in general economic conditions and in laws and regulations, relating to pharmaceutical markets, (ii) currency exchange rate fluctuations, (iii) delays in new product launches, (iv) the inability of Astellas to market existing and new products effectively, (v) the inability of Astellas to continue to effectively research and develop products accepted by customers in highly competitive markets, and (vi) infringements of Astellas' intellectual property rights by third parties.

Information about pharmaceutical products (including products currently in development) which is included in this press release is not intended to constitute an advertisement or medical advice.

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2 The White House. The Opioid Crisis. 2017; https://www.whitehouse.gov/opioids/. Accessed 25 June 2020.

3 Rasmussen K, et al. NIDA's Medication Development Priorities in Response to the Opioid Crisis: Ten Most Wanted. Neuropsychopharmacology (2019); 44:657-659.

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