

MEDIA RELEASE • COMMUNIQUE AUX MEDIAS • MEDIENMITTEILUNG**Novartis announces clinical collaboration with Pfizer to advance the treatment of NASH**

- *Agreement includes a clinical trial to evaluate a combination of tropifexor (LJN452) and one or more Pfizer compounds for the treatment of non-alcoholic steatohepatitis (NASH)*
- *Novartis has a leading development portfolio in non-viral liver diseases, including NASH*
- *There are currently no approved treatments for NASH, a progressive form of non-alcoholic fatty liver disease, which affects up to 6.5% of the population worldwide^{1,2}*

Basel, October 29, 2018 – Novartis announced today that it has entered into a clinical development agreement with Pfizer which will include a study combining tropifexor and one or more Pfizer compounds for the treatment of NASH, including an Acetyl CoA-Carboxylase (ACC) Inhibitor (PF-05221304, a Diacylglycerol O-Acyltransferase 2 (DGAT2) Inhibitor (PF-06865571, and a Ketohehexokinase (KHK) Inhibitor (PF-06835919). The financial details of this transaction are not disclosed.

“Novartis has a leading development portfolio in non-viral liver diseases and I believe especially in our combination therapies. Liver diseases, including NASH, are multifaceted with various factors that contribute to the progression of the disease. This makes them difficult to treat with a single compound,” said Eric Hughes, Global Development Unit Head, Immunology, Hepatology and Dermatology. “We want to collaborate with multiple partners to drive the science and understanding of how to treat non-viral liver diseases. Targeting different pathways in NASH with a broad array of therapies is an essential strategy to bring the best treatments to patients.”

NASH is a complex condition with no currently available treatment options³. NASH presents a high unmet patient need, as it affects up to 6.5% of the population worldwide, and is largely asymptomatic^{2,4}. As fat builds up in the liver, it can trigger a vicious cycle of chronic inflammation and liver scarring called fibrosis⁵. Over time, liver inflammation and fibrosis may progress to cirrhosis, which can lead to liver failure and death^{5,6}.

About tropifexor (LJN452)

Novartis is developing a Farnesoid X receptor (FXR) agonist for the treatment of NASH. The non-bile acid FXR agonist, tropifexor, is an oral treatment designed to address several features of NASH including; the buildup of fat in the liver, inflammation and fibrosis. Early studies with tropifexor in animal models have shown reduction in fat accumulation in the liver (steatosis), inflammation, and scarring, alongside a favorable safety profile⁷. In Oct 2016, tropifexor was granted Fast Track designation by the US FDA for NASH with liver fibrosis.

About Novartis NASH collaborations

In May 2017, Novartis announced it would exercise an exclusive option for a collaboration and license agreement with Conatus Pharmaceuticals Inc. to develop emricasan (VAY785), an

investigational, first-in-class, pan-caspase inhibitor which works by inhibiting pathways that result in cell death (apoptosis) and inflammation. In March 2017, Novartis announced a Phase IIb clinical trial collaboration with Allergan plc for the treatment of NASH fibrosis combining tropifexor and cenicriviroc (CVC), a once-daily, oral immunomodulator that blocks two chemokine receptors involved in inflammatory and fibrogenic pathways. First patient first visit for the TANDEM study was achieved in September 2018⁸. Both collaborations with Conatus and Allergan have the potential to expand treatment options for people in various stages of NASH, including those with the advanced form of the disease, NASH cirrhosis.

Disclaimer

This press release contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements can generally be identified by words such as “to advance,” “portfolio,” “want,” “strategy,” “Fast Track designation,” “potential,” “can,” “will,” “expect,” “believe,” “investigational,” or similar terms, or by express or implied discussions regarding potential marketing approvals, new indications or labeling for LJN452 or the other investigational products described in this press release, or regarding potential future revenues from such products or the collaborations with Pfizer, Conatus Pharmaceuticals and Allergan. You should not place undue reliance on these statements. Such forward-looking statements are based on our current beliefs and expectations regarding future events, and are subject to significant known and unknown risks and uncertainties. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those set forth in the forward-looking statements. There can be no guarantee that LJN452 or the other investigational products described in this press release will be submitted or approved for sale or for any additional indications or labeling in any market, or at any particular time. Neither can there be any guarantee that the collaborations with Pfizer, Conatus Pharmaceuticals or Allergan will achieve any or all of their respective intended goals and objectives, or be commercially successful. Nor can there be any guarantee that LJN452 or the other investigational products described in this press release will be commercially successful in the future. In particular, our expectations regarding such products and the collaborations with Pfizer, Conatus Pharmaceuticals and Allergan could be affected by, among other things, the uncertainties inherent in research and development, including clinical trial results and additional analysis of existing clinical data; regulatory actions or delays or government regulation generally; global trends toward health care cost containment, including government, payor and general public pricing and reimbursement pressures; our ability to obtain or maintain proprietary intellectual property protection; the particular prescribing preferences of physicians and patients; general political and economic conditions; safety, quality or manufacturing issues; potential or actual data security and data privacy breaches, or disruptions of our information technology systems, and other risks and factors referred to in Novartis AG’s current Form 20-F on file with the US Securities and Exchange Commission. Novartis is providing the information in this press release as of this date and does not undertake any obligation to update any forward-looking statements contained in this press release as a result of new information, future events or otherwise.

About Novartis

Novartis is reimagining medicine to improve and extend people’s lives. As a leading global medicines company, we use innovative science and digital technologies to create transformative treatments in areas of great medical need. In our quest to find new medicines, we consistently rank among the world’s top companies investing in research and development. Novartis products reach nearly 1 billion people globally and we are finding innovative ways to expand access to our latest treatments. About 125 000 people of more than 140 nationalities work at Novartis around the world. Find out more at www.novartis.com.

Novartis is on Twitter. Sign up to follow @Novartis at <http://twitter.com/novartis>
For Novartis multimedia content, please visit www.novartis.com/news/media-library

For questions about the site or required registration, please contact media.relations@novartis.com

References

1. Vernon G, Baranova A, Younossi ZM. Systematic review: the epidemiology and natural history of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis in adults. *Aliment Pharmacol Ther.* 2011;34(3):274-85.
2. Younossi ZM, et al. Global epidemiology of nonalcoholic fatty liver disease-Meta-analytic assessment of prevalence, incidence, and outcomes. *Hepatology.* 2016;64(1):73-84.
3. Wong VW, et al. Pathogenesis and novel treatment options for non-alcoholic steatohepatitis. *The Lancet.* 2016;1:56-67.
4. National Institute of Diabetes and Digestive and Kidney Diseases. Nonalcoholic Fatty Liver Disease (NAFLD) & Nonalcoholic Steatohepatitis (NASH). Available at: <https://www.niddk.nih.gov/health-information/liver-disease/nafl-d-nash/symptoms-causes> Last accessed: October 2018.
5. National Institute of Diabetes and Digestive and Kidney Diseases. Definition & Facts of NAFLD & NASH . Available at: <https://www.niddk.nih.gov/health-information/liver-disease/nafl-d-nash/definition-facts>. Last accessed: October 2018.
6. Chalasani, MD et al. The Diagnosis and Management of Non-Alcoholic Fatty Liver Disease: Practice Guideline by the American Association for the Study of Liver Diseases, American College of Gastroenterology, and the American Gastroenterological Association. *Hepatology* 2012;55(6):2005-23.
7. Laffitte et al. Combination Treatment of Tropifexor (LJN452) and Cenicriviroc Shows Additive Effects in a Diet-induced NASH Model. Poster 2052, presented at The Liver Meeting®, the American Association for the Study of Liver Diseases, Washington, DC, USA, October 20–24, 2017.
8. Safety, Tolerability, and Efficacy of a Combination Treatment of Tropifexor (LJN452) and Cenicriviroc (CVC) in Adult Patients With Nonalcoholic Steatohepatitis (NASH) and Liver Fibrosis (TANDEM). Available at: <https://clinicaltrials.gov/ct2/show/NCT03517540>. Last accessed October 2018.

###

Novartis Media Relations

Central media line: +41 61 324 2200

E-mail: media.relations@novartis.com

Eric Althoff
Novartis Global Media Relations
+41 61 324 7999 (direct)
+41 79 593 4202 (mobile)
eric.althoff@novartis.com

Friedrich von Heyl
Novartis Global Pharma Communications
+41 61 324 8984 (direct)
+41 79 749 0286 (mobile)
friedrich.vonheyhl@novartis.com

Novartis Investor Relations

Central investor relations line: +41 61 324 7944

E-mail: investor.relations@novartis.com

Central
Samir Shah +41 61 324 7944
Pierre-Michel Bringer +41 61 324 1065
Thomas Hungerbuehler +41 61 324 8425
Isabella Zinck +41 61 324 7188

North America
Richard Pulik +1 212 830 2448
Cory Twining +1 212 830 2417