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MEDIA UPDATE • MEDIA UPDATE • MEDIA UPDATE

Novartis announces that Jakavi® (ruxolitinib) meets primary endpoint in Phase III study of acute graft-versus-host disease

- *REACH2 trial results confirm Jakavi significantly improves overall response rate (ORR) at 28 days vs. best available therapy in steroid-refractory acute graft-versus-host disease (GvHD)*[1]
- *GvHD is a serious and common complication of stem cell transplants with a one-year death rate as high as 60-80% in its acute form*[2-4]
- *Full results to be submitted to upcoming medical congresses; Novartis expects to initiate discussions with ex-U.S. regulatory authorities*

Basel, October 16, 2019 — Novartis today announced positive topline results from the Phase III REACH2 study evaluating Jakavi® (ruxolitinib) in patients with steroid-refractory acute graft-versus-host disease (GvHD). The study met its primary endpoint of superior overall response rate (ORR) at day 28 of treatment with Jakavi, compared with best available therapy (BAT)[1]. ORR is a standard measure of patient response to therapy.

"As many as half of hematopoietic stem cell transplant recipients develop acute GvHD[5]," said John Tsai, MD, Head of Global Drug Development and Chief Medical Officer, Novartis. "We are delighted that Jakavi showed such promise in this very difficult condition especially since few second-line treatment options exist. These impressive results will be part of our regulatory submissions seeking approval in Europe and other countries."

No new safety signals were observed in REACH2; adverse events attributable to treatment were consistent with the known safety profile of Jakavi[1]. Jakavi is approved for use in various hematological indications in more than 100 countries around the world.

Novartis expects to present the full REACH2 results at an upcoming medical congress and will initiate discussions with ex-U.S. regulatory authorities in 2020. Earlier this year, the U.S. FDA approved ruxolitinib for the treatment of steroid-refractory acute GvHD in adult and pediatric patients 12 years and older based on results of the single arm Phase II REACH1 trial. The Phase III REACH3 study in patients with steroid-refractory chronic GvHD is ongoing and results are expected next year. The REACH studies are part of the largest registration trial program in patients with steroid-refractory acute and chronic graft-versus-host disease to-date.

About Jakavi® (ruxolitinib)
Jakavi (ruxolitinib) is an oral inhibitor of the JAK 1 and JAK 2 tyrosine kinases. Jakavi is approved by the European Commission for the treatment of adult patients with polycythemia

vera (PV) who are resistant to or intolerant of hydroxyurea and for the treatment of disease-related splenomegaly or symptoms in adult patients with primary myelofibrosis (MF) (also known as chronic idiopathic MF), post-polycythemia vera MF or post-essential thrombocythemia MF. Jakavi is approved in 101 countries for patients with MF, including EU countries, Switzerland, Canada, Japan and in more than 75 countries for patients with PV, including EU countries, Switzerland, Japan and Canada. The exact indication for Jakavi varies by country. Additional worldwide regulatory filings are underway in MF and PV.

Novartis licensed ruxolitinib from Incyte Corporation for development and commercialization outside the United States. Jakavi is marketed in the United States by Incyte Corporation as Jakafi® for patients with PV who have had an inadequate response to or are intolerant of hydroxyurea, for patients with intermediate or high-risk MF, and steroid-refractory acute GvHD in adult and pediatric patients 12 years and older.

The recommended starting dose of Jakavi in PV is 10 mg given orally twice daily. The recommended starting dose of Jakavi in MF is 15 mg given orally twice daily for patients with a platelet count between 100,000 cubic millimeters (mm^6) and 200,000 mm^6, and 20 mg twice daily for patients with a platelet count of >200,000 mm.[6] Doses may be titrated based on safety and efficacy. There is limited information to recommend a starting dose for MF and PV patients with platelet counts between 50,000/mm^6 and <100,000/mm^6. The maximum recommended starting dose in these patients is 5 mg twice daily, and patients should be titrated cautiously[7].

Jakavi is a registered trademark of Novartis AG in countries outside the United States. Jakafi is a registered trademark of Incyte Corporation. The safety and efficacy profile of Jakavi has not yet been established outside of its approved indications.

Jakavi Important Safety Information for Treatment of Myelofibrosis (MF) and Polycythemia Vera (PV)
Jakavi can cause serious side effects, including a decrease in blood cell count and infections. Complete blood count monitoring is recommended. Dose reduction or interruption may be required in patients with any hepatic impairment or severe renal impairment or in patients developing hematologic adverse reactions such as thrombocytopenia, anemia and neutropenia. Dose reductions are also recommended when Jakavi is co-administered with strong CYP3A4 inhibitors or fluconazole. Use of Jakavi during pregnancy is not recommended, and women should avoid becoming pregnant during Jakavi therapy. Women taking Jakavi should not breast feed. Progressive multifocal leukoencephalopathy (PML) has been reported. Physicians should be alert for neuropsychiatric symptoms suggestive of PML. Hepatitis B viral load (HBV-DNA titer) increases have been reported in patients with chronic HBV infections. Patients with chronic HBV infection should be treated and monitored according to clinical guidelines. Non-melanoma skin cancer (NMSC) has been reported in Jakavi treated patients. Periodic skin examination is recommended. Very common adverse reactions in MF (>10%) include urinary tract infections, anemia, thrombocytopenia, neutropenia, hypercholesterolemia, dizziness, headache, alanine aminotransferase increased, aspartate aminotransferase increased, bruising and weight gain. Common adverse reactions in MF (1 to 10%) include herpes zoster and flatulence. Uncommon adverse reactions in MF include tuberculosis. Very common adverse reactions in PV (>10%) include anemia, thrombocytopenia, hypercholesterolemia, hypertriglyceridemia, dizziness, alanine aminotransferase increased and aspartate aminotransferase increased. Common adverse reactions in PV (1 to 10%) include urinary tract infections, herpes zoster, weight gain, constipation and hypertension.

Please see full Prescribing Information available at www.jakavi.com.

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This media update 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 “potential,” “can,” “will,” “plan,” “expect,” “anticipate,” “look forward,” “believe,” “committed,” “investigational,” “pipeline,” “launch,” or similar terms, or by express or implied discussions regarding potential marketing approvals, new indications or labeling for the investigational or approved products described in this media update, or regarding potential future revenues from such products. 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 the investigational or approved products described in this media update will be submitted or approved for sale or for any additional indications or labeling in any market, or at any particular time. Nor can there be any guarantee that such products will be commercially successful in the future. In particular, our expectations regarding such products 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 and requirements for increased pricing transparency; 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 media update as of this date and does not undertake any obligation to update any forward-looking statements contained in this media update 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 more than 750 million people globally and we are finding innovative ways to expand access to our latest treatments. About 108 000 people of more than 140 nationalities work at Novartis around the world. Find out more at **www.novartis.com**.

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