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MEDIA & INVESTOR RELEASE

Novartis five-year Kymriah® data show durable remission and long-term survival maintained in children and young adults with advanced B-cell ALL

- *In final ELIANA analysis, 55% of patients with relapsed or refractory (r/r) B-cell acute lymphoblastic leukemia (ALL) who were treated with CAR-T cell therapy Kymriah were still alive after more than five years*[1]

- *44% of patients who experienced remission within three months of infusion were still in remission at the five-year mark, demonstrating the long-term benefit and curative potential of one-time Kymriah infusion*[1]

- *The safety profile remains consistent with previously reported results, without late adverse effects in these heavily pretreated patients*[1]

- *Novartis is committed to delivering transformative CAR-T cell therapies with these longer-term data, recent regulatory approvals for Kymriah in r/r follicular lymphoma and ongoing development of T-Charge™ platform*

Basel, June 12, 2022 — Novartis today announced long-term results from the ELIANA pivotal clinical trial of Kymriah® (tisagenlecleucel), the first-ever approved CAR-T cell therapy, in children and young adult patients with relapsed or refractory (r/r) B-cell acute lymphoblastic leukemia (ALL), with a maximum survival follow-up of 5.9 years. For the 79 patients treated with Kymriah in this study, the five-year overall survival (OS) rate was 55% (95% CI, 43-66), while the median event-free survival (EFS) for patients in remission within three months of infusion (n=65) was 43.8 months. These findings demonstrate the curative potential of Kymriah, the only CAR-T cell therapy available for these patients who previously had limited treatment options. These data were presented as an oral presentation during the 2022 European Hematology Association (EHA) Hybrid Congress (Abstract #S112)[1].

“These data mark a moment of profound hope for children, young adults and their families with relapsed or refractory B-cell ALL, as relapse after five years is rare,” said Stephan Grupp, MD, PhD, Section Chief of the Cellular Therapy and Transplant Section, and Inaugural Director of the Susan S. and Stephen P. Kelly Center for Cancer Immunotherapy at Children's Hospital of Philadelphia (CHOP). “Since the approval of Kymriah nearly five years ago, we have been able to offer a truly game-changing option to patients who previously faced a five-year survival rate of less than 10 percent.”

This long-term follow up of ELIANA demonstrated the potential for Kymriah to transform cancer treatment in pediatric and young adult patients with r/r B-cell ALL, significantly improving outcomes with durable responses and a consistent safety profile in this patient population[1]:

- Eighty-two percent of patients experienced remission (either complete remission [CR] or CR with incomplete hematologic recovery within three months after infusion) (95% CI, 72-90)
- For patients in remission, the five-year relapse-free survival (RFS) rate was 44% (95% CI, 31-56) and the median RFS was 43 months
- No new or unexpected adverse events were reported during long-term follow-up

“At Novartis, we strive for cures. With nearly six-year follow-up data in these pediatric and young adults treated for B-cell ALL, we have our strongest evidence yet that one-time treatment with Kymriah has curative potential,” said Jeff Legos, Executive Vice President, Global Head of Oncology & Hematology Development. “These results strengthen our confidence in CAR-T cell therapies as a truly transformative and paradigm-shifting advance in cancer care, as well as our commitment to continue developing this technology with next-generation platforms.”

Additional updates on the Novartis CAR-T program presented at the 2022 EHA Congress include new data from more patients and longer follow-up from the first-in-human dose-escalation trials with YTB323 in adults with r/r diffuse large B-cell lymphoma and PHE885 in adults with r/r multiple myeloma, the first Novartis CAR-T cell therapies developed using the Novartis T-Charge™ platform[2,3,4]. Visit https://www.hcp.novartis.com/virtual-congress/eha-2022/ to learn more about these data and our ongoing commitment to reimagining cancer care with CAR-T cell therapies.

About Kymriah®

Kymriah is the first-ever FDA-approved CAR-T cell therapy. It is a one-time treatment designed to empower patients’ immune systems to fight their cancer. Kymriah is currently approved for the treatment of r/r pediatric and young adult (up to and including 25 years of age) acute lymphoblastic leukemia (ALL), r/r adult diffuse large B-cell lymphoma (DLBCL) and r/r adult follicular lymphoma[1].

About the ELIANA Trial

ELIANA was the first pediatric global CAR-T cell therapy registration trial, examining patients in 25 centers in 11 countries across the US, Canada, Australia, Japan and the EU, including: Austria, Belgium, France, Germany, Italy, Norway and Spain. The trial was an open-label, multicenter, single-arm, global Phase II trial investigating the efficacy and safety of Kymriah in pediatric and young adult patients in r/r B-cell ALL who were primary refractory, chemorefractory, relapsed after, or were not eligible for allogeneic stem cell transplantation (SCT). The primary endpoint was overall remission rate (ORR), defined as best overall response of CR or CR with incomplete blood count recovery (CRi) within 3 months and maintained for ≥28 day. The secondary endpoints include CR/CRi with undetectable minimal residual disease (MRD), duration of remission, event-free survival, overall survival, cellular kinetics and safety[5].

About T-Charge™

T-Charge is a next-generation CAR-T platform, innovated at the Novartis Institutes for BioMedical Research (NIBR), that will serve as the foundation for various new investigational CAR-T cell therapies in the Novartis pipeline. By implementing the T-Charge platform, we aim to revolutionize CAR-T cell therapy with new products that have the potential to offer patients a higher likelihood of better and more durable responses, improved long-term outcomes and a reduced risk of severe adverse events. The T-Charge platform preserves T cell stemness (T cell ability to self-renew and mature), an important T cell characteristic closely tied to its therapeutic potential, which results in a product containing greater proliferative potential and fewer exhausted T cells. With T-Charge, CAR-T cell expansion occurs primarily within the

patient's body (in-vivo), eliminating the need for an extended culture time outside of the body (ex-vivo). The T-Charge platform, which implements important process efficiencies, will be rapid, compared with traditional CAR-T, and reliable, through simplified processes and streamlined quality control. Multiple CAR-T therapies, including YTB323 and PHE885, are being developed using the Novartis T-Charge platform.

About Novartis commitment to Oncology Cell Therapy
As part of the unique Novartis strategy to pursue four cancer treatment platforms – radioligand therapy, targeted therapy, immunotherapy and cell and gene therapy – we strive for cures through cell therapies in order to enable more patients to live cancer-free. We will continue to pioneer the science and invest in our manufacturing and supply chain process to further advance transformative innovation.

Novartis was the first pharmaceutical company to significantly invest in pioneering CAR-T research and initiate global CAR-T trials. Kymriah, the first approved CAR-T cell therapy, developed in collaboration with the Perelman School of Medicine at the University of Pennsylvania, is the foundation of the Novartis commitment to CAR-T cell therapy.

We have made strong progress in broadening our delivery of Kymriah, which is currently available for use in at least one indication in 30 countries and at more than 370 certified treatment centers, with clinical and real-world experience from administration to more than 6,900 patients. We continue to pioneer in cell therapy, leveraging our vast experience to develop next-generation CAR-T cell therapies. These therapies will utilize our new T-Charge™ platform being evaluated to expand across hematological malignancies and bring hope for a cure to patients with other cancer types.

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 "potential," "can," "will," "plan," "may," "could," "would," "expect," "anticipate," "seek," "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 press release, 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 press release 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, economic and business conditions, including the effects of and efforts to mitigate pandemic diseases such as COVID-19; safety, quality, data integrity 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 800 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 https://www.novartis.com.

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References

1. Rives, S. et.al. Tisagenlecleucel in pediatric and young adult patients with relapsed/refractory (r/r) B-cell acute lymphoblastic leukemia (B-ALL): Final analyses from the ELIANA study. Oral presentation at: 2022 Hybrid Congress of the European Hematology Association (EHA), June 9-12, Vienna, Austria. Abstract #S112.
2. Sperling, S. et. al. Phase I study data update of PHE885, a fully human BCMA-directed CAR-T cell therapy manufactured using the T-Charge™ platform for patients with relapsed/refractory (r/r) multiple myeloma (MM). Poster presented at: 2022 Hybrid Congress of the European Hematology Association (EHA), June 9-12, Vienna, Austria. Abstract #P1446.
3. Munshi, N. et. al. Phase II study of PHE885, a B-cell maturation antigen-directed chimeric antigen receptor t-cell therapy, in adults with relapsed/refractory (r/r) multiple myeloma (MM). Publication only at: 2022 Hybrid Congress of the European Hematology Association (EHA), June 9-12, Vienna, Austria. Abstract #PB1983.
4. Dickinson, M. et. al. Phase I study of YTB323, a chimeric antigen receptor (CAR)-T cell therapy manufactured using T-Charge™, in patients with relapsed/refractory diffuse large B-cell lymphoma (DLBCL). Oral presentation at: 2022 Hybrid Congress of the European Hematology Association (EHA), June 9-12, Vienna, Austria. Abstract #S212.
5. Kymriah [prescribing information]. East Hanover, NJ: Novartis Pharmaceuticals Corp.

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