Molecular Partners Initiates Clinical Study of MP0533 for the Treatment of Acute Myeloid Leukemia (AML)

- MP0533, a trispecific T cell engaging DARPin, targets CD33-CD123-CD70 with a unique avidity driven mechanism; engaging CD3 on T cells when binding either two or three tumor-associated antigens to enhance selectivity for AML cells
- Preclinical data demonstrated that MP0533 can selectively target and kill both leukemic blast cells and stem cells, while preferentially sparing healthy cells

ZURICH-SCHLIEREN, Switzerland and CONCORD, Mass., January 16, 2023 - **Ad hoc announcement pursuant to Art. 53 LR** Molecular Partners AG (SIX: MOLN; NASDAQ: MOLN), a clinical-stage biotech company developing a new class of custom-built protein drugs known as DARPin therapeutics, announced today that the first patient has been treated in a Phase 1 first-in-human study evaluating the safety, tolerability, and efficacy of MP0533, the company's candidate for acute myeloid leukemia (AML). MP0533 is designed to focus an immune attack against AML in a new way that preferentially spares healthy cells, which has been a historic challenge for CD3-targeting therapeutics.

"AML is a notoriously difficult cancer to treat, largely due to the overlapping targets expressed on both healthy and leukemic cells. Our team has worked relentlessly over the past three years to develop a molecule intended to target these cancerous cells while avoiding healthy cells. MP0533's mechanism represents a new level of precision targeting in complex cancers that may permit greater use of the cytotoxic power of engaging CD3," said Nicolas Leupin, M.D., Ph.D., Chief Medical Officer of Molecular Partners. "We are grateful to our team and our collaborators for reaching this milestone and look forward to learning more about the potential of MP0533 to help these patients."

MP0533 simultaneously targets three surface proteins, CD33, CD123, and CD70, that are vastly more likely to be expressed together on AML blast cells and leukemic stem cells over healthy cells. It also targets CD3 on cytotoxic T cells, which will preferentially activate when at least two of the surface proteins are bound. This novel mechanism is intended to greatly favor CD3 activation in leukemic stem cells rather than the systemic activation seen in previous CD3-based T cell engagers.

The Phase 1 open-label dose escalation study will enroll patients with relapsed/refractory AML and higher-risk myelodysplastic syndromes (MDS). It is designed to assess the safety, tolerability, and efficacy of MP0533 in addition to a range of secondary endpoints, such as the effect on LSCs, pharmacokinetics, T-cell activation, and cytokine release. Between 20-45 patients are expected to be enrolled across five sites in Switzerland and the Netherlands in collaboration with select sites within the HOVON cooperative group. Additional clinical sites are planned as well.

MP0533 preclinical data demonstrates it induces preferential T cell mediated killing of cells expressing two or three of the tumor associated antigens (TAAs) compared to cells expressing a single TAA. MP0533 also demonstrated an ability to induce T cell activation and killing of AML cells in samples from newly diagnosed and previously treated patients. The research also showed that MP0533 was able to directly target and kill LSCs while sparing a variety of healthy cells including hematopoietic stem cells, endothelial cells, and T cells.

About Molecular Partners' Oncology Product Candidates
Molecular Partners is developing several candidates designed to activate the immune system to fight cancer while reducing damage to healthy cells. These candidates use multiple novel DARPin technologies potentially applicable against a wide range of tumor types, including DARPin candidates with the ability to restrict immune activation to the tumor microenvironment, the ability to target intracellular disease-associated proteins, and multiple novel control mechanisms for immune activation designed to direct immune attack to the right cells, at the right place, and at the right time. These capabilities can be combined during candidate design through the inherent modularity of the DARPin platform, to provide precise control over immune activation and potentially enable more effective cancer therapies.

About Molecular Partners AG
Molecular Partners AG is a clinical-stage biotech company developing DARPin therapeutics, a new class of custom-built protein drugs designed to address challenges current modalities cannot. The Company has formed partnerships with leading pharmaceutical companies to advance DARPin therapeutics in the areas of ophthalmology, oncology, and infectious disease, and has compounds in various stages of clinical and preclinical development across multiple therapeutic areas. www.molecularpartners.com; Find us on Twitter - @MolecularPrtnrs

Cautionary Note Regarding Forward-Looking Statements
Any statements contained in this press release that do not describe historical facts may constitute forward-looking statements as that term is defined in the Private Securities Litigation Reform Act of 1995, as amended, including, without limitation, implied and express statements regarding the clinical development of Molecular Partners' current or future product candidates, expectations regarding timing for reporting data from ongoing clinical trials or the initiation of future clinical trials, the potential therapeutic and clinical benefits of Molecular Partners' product candidates, the selection and development of future antiviral or other programs, and Molecular Partners' expected expenses and cash utilization for 2022 and its expectation that its current cash resources will be sufficient to fund its operations and capital expenditure requirements into 2026. These statements may be identified by words such as "believe", "expect", "may", "plan", "potential", "will", "would" and similar expressions, and are based on Molecular Partners AG's current beliefs and expectations. These statements involve risks and uncertainties that could cause actual results to differ materially from those reflected in such statements. Some of the key factors that could cause actual results to differ from Molecular Partners' expectations include its plans to develop and potentially commercialize its product candidates; Molecular Partners' reliance on third party partners and collaborators over which it may not always have full control; Molecular Partners' ongoing and planned clinical trials and preclinical studies for its product candidates, including the timing of such trials and studies; the risk that the results of preclinical studies and clinical trials may not be predictive of future results in connection with future clinical trials; the timing of and Molecular Partners' ability to obtain and maintain regulatory approvals for its product candidates; the extent of clinical trials potentially required for Molecular Partners' product candidates; the clinical utility and ability to achieve market acceptance of Molecular Partners' product candidates; the potential impact of the COVID-19 pandemic on Molecular Partners' preclinical studies, clinical trials or operations, or the operations of third parties on which it relies; Molecular Partners' plans and development of any new indications for its product candidates; Molecular Partners'

commercialization, marketing and manufacturing capabilities and strategy; Molecular Partners' intellectual property position; Molecular Partners' ability to identify and in-license additional product candidates; and other risks and uncertainties that are described in the Risk Factors section of Molecular Partners' Annual Report on Form 20-F for the fiscal year ended December 31, 2021 filed with Securities and Exchange Commission (SEC) on March 15, 2022 and other filings Molecular Partners makes with the SEC. These documents are available on the Investors page of Molecular Partners' website at www.molecularpartners.com. Any forward-looking statements speak only as of the date of this press release and are based on information available to Molecular Partners as of the date of this release, and Molecular Partners assumes no obligation to, and does not intend to, update any forward-looking statements, whether as a result of new information, future events or otherwise.

For further details, please contact:
Seth Lewis, Investor Relations
seth.lewis@molecularpartners.com
Tel: +1 781 420 2361

Antonio Ligi, Communications
Zürich-Schlieren, Switzerland
antonio.ligi@molecularpartners.com
Tel: +41 79 723 36 81