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Moleculin Announces Preclinical Data Confirms Efficacy of Annamycin in Lung Metastases

Data Presented at the AACR Annual Meeting

HOUSTON, June 25, 2020 /PRNewswire/ -- Moleculin Biotech, Inc., (Nasdaq: MBRX) ("Moleculin" or the "Company"), a clinical stage pharmaceutical company with a broad portfolio of drug candidates targeting highly resistant tumors and viruses, today announced a presentation at the American Association of Cancer Research (AACR) Annual Meeting held from June 22nd-24th, 2020, illustrating a unique approach to creating drugs capable of reaching tumors hiding in organs where existing anticancer drugs cannot accumulate in therapeutic concentrations. A poster presentation entitled, "Targeting Cancer Sanctuary Sites: A Novel Approach to the Treatment of Lung Localized Tumors," provided an overview of data demonstrating that uniquely high uptake and retention of Annamycin in the lungs results in consistently high in vivo activity against wide range of lung-localized tumors in mice.

"We are very encouraged by this data, as we believe it further demonstrates Annamycin's anti-cancer activity against tumors that evade therapies that may be initially effective in their primary location of origin, but are protected by metastasis to sanctuary organs. In the case of sarcomas treated with the current standard of care, doxorubicin, tumors may be initially responsive in their primary location, but become unresponsive after metastasis to the lungs, which eventually becomes the most likely cause of patients' death," commented Walter Klemp, Chairman and CEO of Moleculin. "This research also sheds light on why doxorubicin, the current standard of care for many types of cancer, is not effective against lung-localized cancer. Subsequently, we believe that Annamycin's ability in animal models to effectively accumulate in the lungs without noticeable side effects offers unique therapeutic opportunities that should be explored for the benefit of cancer patients with lung-localized tumors."

Mr. Klemp concluded: "One of the reasons we are so excited about Annamycin's potential to treat lung-localized tumors is its ability in animal models to accumulate in the lungs and lack of toxic side effects related to the high lung accumulation. This was once again confirmed by the data, as Annamycin accumulated in the lungs at nearly 6 times the level of doxorubicin.

Importantly, Annamycin's ability to accumulate in the lungs also led to high anti-tumor activity, which ranged from the inhibition of tumor progression to complete tumor eradication, resulting in significant improvement of survival in all the models tested. We look forward to exploring Annamycin's clinical potential to target tumors localized in the lungs, one of the most common sites of cancer metastasis."

The accepted abstract stated, "The high cytotoxic potency of Annamycin against MDR cancer cells is related, in part, to its ability to overcome ABC transporter-mediated efflux and, in contrast to doxorubicin, achieve high intracellular uptake. A greatly increased concentration of Annamycin in the lung, as compared to doxorubicin, leads to high drug efficacy in vivo in lung-localized tumor models. In summary, our studies (1) support the hypothesis of lungs being a sanctuary site for cancer cells and (2) demonstrate that effective targeting of cancers metastatic to the lung is possible by chemical modification of clinically used but currently ineffective drugs, especially in combination with appropriate drug delivery. In more general terms, these studies indicate that the proposed approach can also lead to the identification and elimination of cancer sanctuary sites other than the lungs and creation of more effective anticancer therapies."

About Moleculin Biotech, Inc.

Moleculin Biotech, Inc. is a clinical stage pharmaceutical company focused on the development of a broad portfolio of oncology drug candidates for the treatment of highly resistant tumors and viruses. The Company's clinical stage drugs are: Annamycin, a Next Generation Anthracycline, designed to avoid multidrug resistance mechanisms with little to no cardiotoxicity, being studied for the treatment of relapsed or refractory acute myeloid leukemia, more commonly referred to as AML; WP1066, an Immune/Transcription Modulator capable of inhibiting p-STAT3 and other oncogenic transcription factors while also stimulating a natural immune response, being studied for brain tumors, pancreatic cancer and hematologic malignancies; and WP1220, an analog to WP1066, being studied for the topical treatment of cutaneous T-cell lymphoma. Moleculin is also engaged in preclinical development of additional drug candidates, including additional Immune/Transcription Modulators, as well as compounds capable of Metabolism/Glycosylation Inhibition, such as WP1122. Moleculin has the exclusive worldwide rights (subject to certain territories for which it has issued sublicenses) to all of the above technologies.

For more information about the Company, please visithttp://www.moleculin.com.

Forward-Looking Statements

Some of the statements in this release are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, Section 21E of the Securities Exchange Act of 1934 and the Private Securities Litigation Reform Act of 1995, which involve risks and uncertainties. Forward-looking statements in this press release include, without limitation, the ability of Annamycin to show safety and efficacy in patients with lung metastases. Although Moleculin believes that the expectations reflected in such forward-looking statements are reasonable as of the date made, expectations may prove to have been materially different from the results expressed or implied by such forward-looking statements. Moleculin Biotech has attempted to identify forward-looking statements by terminology including "believes," "estimates," "anticipates," "expects," "plans," "projects," "intends," "potential," "may," "could," "might," "will," "should," "approximately" or other words

that convey uncertainty of future events or outcomes to identify these forward-looking statements. These statements are only predictions and involve known and unknown risks, uncertainties, and other factors, including those discussed under Item 1A. "Risk Factors" in our most recently filed Form 10-K filed with the Securities and Exchange Commission ("SEC") and updated from time to time in our Form 10-Q filings and in our other public filings with the SEC. Any forward-looking statements contained in this release speak only as of its date. We undertake no obligation to update any forward-looking statements contained in this release to reflect events or circumstances occurring after its date or to reflect the occurrence of unanticipated events.

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