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Moleculin Announces Active Compound in WP1122 Reduces Coronavirus Replication In Vitro by 100%

Independent research shows 2-DG activity against virus that causes COVID-19

HOUSTON, April 8, 2020 /PRNewswire/ -- Moleculin Biotech, Inc., (Nasdaq: MBRX) ("Moleculin" or the "Company"), a clinical stage pharmaceutical company with a broad portfolio of drug candidates, today announced that independent research found 2-deoxy-D-glucose ("2-DG") to reduce replication of SARS-CoV-2, the virus that causes COVID-19, by 100% in in vitro testing.

Researchers at the University of Frankfurt disclosed the findings in their article submitted to NatureResearch on March 11, 2020 (Bojkova, D et al; DOI: 10.21203/rs.3.rs-17218/v1) (https://www.researchsquare.com/article/rs-17218/v1). The authors reported that inhibiting glycolysis with non-toxic concentrations of 2-DG completely prevented SARS-CoV–2 replication in Caco–2 cells. Glycolysis is a process by which cells convert glucose into energy and infected (host) cells are induced by viruses to dramatically increase their dependence on glycolysis. 2-DG inhibits glycolysis because, although it appears to cells to be glucose, it is in fact a decoy that cannot be converted into energy.

Moleculin's drug candidate, WP1122, is referred to as a "prodrug" of 2-DG whereby chemical elements are added to 2-DG to improve its delivery in vivo. Once administered, these added elements are removed by normal metabolic processes and what remains is 2-DG. As a result, 2-DG is the active compound in WP1122. In chemical terms, it is referred to as the active "moiety" (subpart) of WP1122.

"This is the breakthrough we were looking for, only it came from an unexpected source," commented Walter Klemp, Chairman and CEO of Moleculin. "Normally, we wouldn't have access to data like this until it is published, but the willingness of the authors to pre-release this data will help support our development of WP1122 for treating COVID-19."

Dr. Don Picker, Chief Science Officer of Moleculin explained: "2-DG is what we call the 'active moiety' in WP1122. The problem with 2-DG is that it is metabolized by the body too

quickly, so you can't get enough concentration in human tissues and organs to be therapeutic. Therefore, even though 2-DG is active against a range of viruses, including SARS-CoV-2, it isn't useful as a clinical therapy because it's too rapidly metabolized. WP1122 appears to solve this problem because it is a 'prodrug' of 2-DG. Its structure enables it to achieve much higher tissue/organ concentrations than 2-DG alone, but once it's in the cell, it metabolizes into the exact same 2-DG that is so effective in vitro."

Moleculin's Chief Medical Officer – New Projects, Dr. Sandra Silberman added: "The FDA has cleared the way for very rapid development of COVID-19 therapies, so we should be able to move WP1122 into the clinics on an expedited basis. Fortunately, it has a very good safety profile in mice. We are in the process of demonstrating safety in additional species before submitting our IND (Investigational New Drug application). Since it has better drug-like properties than 2-DG, WP1122 also actually works better in the animal tumor models we have been studying. We think this bodes well for its potential as a more potent drug than 2-DG as an antiviral agent against coronavirus."

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, under investigation for brain tumors, pancreatic cancer and hematologic malignancies; and WP1220, an analog to WP1066, being developed 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 WP1122, a compound capable of Metabolism/Glycosylation Inhibition.

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 the Company's IND for WP1122 to be allowed by the FDA and for WP1122 to demonstrate safety and efficacy in humans. 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. The Company cautions investors not to place undue reliance on the interim results announced today.

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