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Ensysce Biosciences Advances Breakthrough Opioid With Built-In Overdose Protection Following Positive FDA Feedback

~ Productive FDA Meeting Highlights Path Toward Overdose Protection Labeling and 505(b)(2) Regulatory Strategy ~

~ FDA and Ensysce Aligned on Collaborative Approach to Ensure Product's Full Safety Benefits are Recognized ~

SAN DIEGO, CA / ACCESS Newswire / July 31, 2025 / Ensysce Biosciences, Inc. (NASDAQ:ENSC) ("Ensysce" or the "Company"), a clinical-stage pharmaceutical innovator focused on redefining opioid safety, today announced that it received positive feedback and constructive guidance from the U.S. Food and Drug Administration (FDA) on the development of PF614-MPAR, the Company's first-of-its-kind opioid analgesic designed with both abuse deterrence and overdose protection.

PF614-MPAR has earned the FDA's prestigious Breakthrough Therapy designation and is uniquely engineered using Ensysce's proprietary TAAP™ (Trypsin-Activated Abuse Protection) and MPAR® (Multi-Pill Abuse Resistance) technologies. These platforms are uniquely engineered to maintain powerful pain relief while automatically activating built-in overdose protection if a patient exceeds the prescribed dose-whether accidentally or intentionally.

The FDA meeting held July 23, 2025, focused on the clinical and non-clinical roadmap for PF614-MPAR's approval, with a key emphasis on achieving overdose protection labeling. Both Ensysce and the FDA aligned on a collaborative approach to ensure the product's safety benefits are appropriately recognized. This includes Ensysce working with the FDA to develop a whitepaper on Overdose Protection, while continuing to develop PF614-MPAR. The meeting provided guidance on non-clinical, clinical and manufacturing questions that the Company had posed to the agency, and it also confirmed that PF614-MPAR may be eligible to pursue a streamlined 505(b)(2) regulatory pathway, potentially accelerating its time to market.

"This milestone brings us closer than ever to delivering a new class of opioid analgesics that not only provide critical pain relief but also protect patients from the devastating risks of overdose," said Dr. Lynn Kirkpatrick, CEO of Ensysce Biosciences. "MPAR technology is designed to save lives. While we are initially applying it to opioid pain medications, we also see significant potential in addressing overdose risks in opioid use disorder and ADHD treatments. Our goal is to transform how medicines are designed so that the drugs in every household medicine cabinet are inherently safer."

Development of PF614-MPAR has been supported by two multi-year grants from the National Institute on Drug Abuse (NIDA)[1], the most recent awarded in 2024 which continues to fund the program through May 2027.

[1]The research is supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number UO1DA059791.

About Ensysce Biosciences
Ensysce Biosciences is a clinical stage company with a goal of disrupting the analgesic landscape by introducing a new class of highly novel opioids for the treatment of severe pain. Leveraging its Trypsin-Activated Abuse Protection (TAAP™) and Multi-Pill Abuse Resistance (MPAR®) platforms, the Company is developing unique, tamper-proof treatment options for pain that minimize the risk of both drug abuse and overdose. Ensysce's products are anticipated to provide safer options to treat patients suffering from severe pain and assist in preventing deaths caused by medication abuse. For more information, please visit www.ensysce.com.

Forward-Looking Statements
Statements contained in this press release that are not purely historical may be deemed to be forward-looking statements for the purposes of the safe harbor provisions under The Private Securities Litigation Reform Act of 1995 and other federal securities laws. Without limiting the foregoing, the use of words such as "may," "intends," "can," "might," "will," "expect," "plan," "possible," "believe" and other similar expressions are intended to identify forward-looking statements. The product candidates discussed are in clinic and not approved and there can be no assurance that the clinical programs will be successful in demonstrating safety and/or efficacy, that Ensysce will not encounter problems or delays in clinical development, or that any product candidate will ever receive regulatory approval or be successfully commercialized. All forward-looking statements are based on estimates and assumptions by Ensysce's management that, although Ensysce believes to be reasonable, are inherently uncertain. All forward-looking statements are subject to risks and uncertainties that may cause actual results to differ materially from those that Ensysce expected. In addition, Ensysce's business is subject to additional risks and uncertainties, including among others, the initiation and conduct of preclinical studies and clinical trials; the timing and availability of data from preclinical studies and clinical trials; expectations for regulatory submissions and approvals; potential safety concerns related to, or efficacy of, Ensysce's product candidates; the availability or commercial potential of product candidates; the ability of Ensysce to fund its continued operations, including its planned clinical trials; the dilutive effect of stock issuances from our fundraising; and Ensysce's and its partners' ability to perform under their license, collaboration and manufacturing arrangements. These statements are also subject to a number of material risks and uncertainties that are described in Ensysce's most recent quarterly report on Form 10-Q and current reports on Form 8-K, which are available, free of charge, at the SEC's website at www.sec.gov. Any forward-looking statement speaks only as of the date on which it was made. Ensysce undertakes no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise, except as required under applicable law.

Ensysce Biosciences Company Contact:
Lynn Kirkpatrick, Ph.D.

Chief Executive Officer
(858) 263-4196

Ensysce Biosciences Investor Relations Contact:
Shannon Devine
MZ North America
Main: 203-741-8811
ENSC@mzgroup.us

SOURCE: Ensysce Biosciences