

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549**

**FORM 8-K**

**CURRENT REPORT**  
Pursuant to Section 13 or 15(d)  
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): May 17, 2022 (May 17, 2022)

**Ensysce Biosciences, Inc.**  
(Exact name of registrant as specified in its charter)

Delaware  
(State or other jurisdiction of  
incorporation or organization)

001-38306  
(Commission  
File Number)

82-2755287  
(I.R.S. Employer  
Identification Number)

7946 Ivanhoe Avenue, Suite 201  
La Jolla, California  
(Address of principal executive offices)

92037  
(Zip Code)

(858) 263-4196  
Registrant's telephone number, including area code

N/A  
(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation to the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, par value \$0.0001 per share	ENSC	The Nasdaq Stock Market LLC
Warrants to purchase one share of Common Stock	ENSCW	OTC Pink Open Market

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

**Item 8.01 Other Events.**

On May 17, 2022, Ensysce Biosciences, Inc. delivered a presentation entitled "Improving Prescription Drug Safety Through Chemistry" to investors. A copy of the presentation is filed as Exhibit 99.1 to this Current Report on Form 8-K and is incorporated herein by reference.

**Item 9.01. Financial Statements and Exhibits**

(d) Exhibits

<u>Exhibit No.</u>	<u>Description</u>
99.1	<a href="#">Investor Presentation dated May 17, 2022</a>
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Dated: May 17, 2022

**Ensysce Biosciences, Inc.**

By: /s/ Lynn Kirkpatrick

Name: Dr. Lynn Kirkpatrick

Title: President and Chief Executive Officer



**Ensysce**<sup>™</sup>  
biosciences

NASDAQ: ENSC

Improving Prescription Drug Safety Through Chemistry

**Investor Presentation**  
May 17, 2022

## Disclaimer

Ensysce<sup>™</sup>  
biosciences

Ensysce's PF614 and nafamostat are currently in clinical and pre-clinical trials, involving both the TAAP platform and MPAR platform. Accordingly, PF614 and nafamostat have the risks and uncertainties inherent in any drug in trial-phase, which include, but are not limited to, a failure to show sufficient efficacy to obtain FDA approval, the risk that clinical trials may not confirm any safety, potency or other product characteristics described or assumed herein and the possibility that presently unknown safety risks may occur. The statements made concerning PF614, nafamostat, TAAP and MPAR are subject to the complete set of risks set forth in the Risk Factors disclosure found in the Company's most recent Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 31, 2022.

## Forward Looking Statements

Statements contained in this presentation 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," 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 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 Annual Report on Form 10-K. 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 Overview

## Committed to Stemming the Global Prescription Drug Abuse Epidemic

### Who we are

Clinical-stage biotech company applying transformative chemistry to improve prescription drug safety and performance.

### 2 Core Technology Platforms

**TAAP™**

IMPROVED Trypsin Activated  
Anti-abuse chemistry

**MPAR™**

Combination Products for  
SMART Overdose protection

### Mission

To use TAAP/MPAR to launch the Next Generation opioid products to reduce abuse and overdose while relieving suffering for people with severe pain and CNS disorders.

### NASDAQ: ENSC

Share Price <sup>1</sup>	\$0.67
Market Cap <sup>1</sup>	\$23.2M
Shares Outstanding	34.6M
Nasdaq Listed	July 2021
Float	18.6M
Headquarters	La Jolla, CA

1) As of May 13, 2022



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# Ensysce Investment Summary

- **Clinical stage biotech company** using transformative trypsin-controlled chemistry to improve drug safety and performance.
- **Two highly novel technology platforms** that we believe can be applied to a large majority of prescription drugs, driving internal growth and external partnering opportunities.
- **Targeted therapy areas** focus on products with blockbuster potential in pain, ADHD and respiratory diseases.
- **Shortened development** with Fast Track and 505(b)(2) regulatory pathway, **de-risked with clinical data** that we believe shows that the technology works.
- **Lead product (PF614)** in Phase 2 trial – NCE with patent protection until mid 2030.
- **Strong global patent estate supported by over \$100 M investment** covering composition of matter, pharmaceutical preparations and method of use.
- **Highly experienced management team** with broad biopharma background, from drug development to commercialization.



**TAAP™**  
Anti-abuse chemistry



**MPAR™**  
SMART Overdose protection

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# TAAP™ and MPAR™

## Improving Drug Performance and Safety Through Chemistry

**TAAP™**

IMPROVED Trypsin Activated Abuse Protection

- ANTI-ABUSE** Reduce ability to tamper with drug product to abuse.
- PROTECTIVE** Trypsin activated release only in small intestine.
- CONTROLLABLE** Chemically able to provide immediate or extended release products.
- IMPROVED** TAAP™ able to alter features that make a better drug product.

**MPAR™**

Multi-Pill Abuse Resistance: Combination Products for SMART Overdose Protection

- SMART** Active only on overdose.
- UNIQUE** Platform based on trypsin control of activation and release.
- VAST APPLICABILITY** TAAP™ and MPAR™ can be applied to numerous drug classes.
- COMBINATION** Ultra-potent trypsin inhibitor, nafamostat, added to TAAP products.

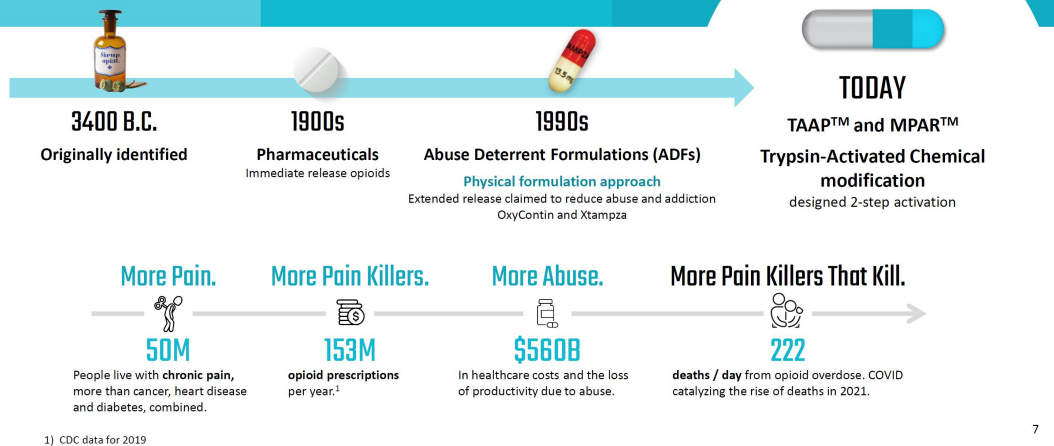
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# Addressing Opioid Abuse + Overdose

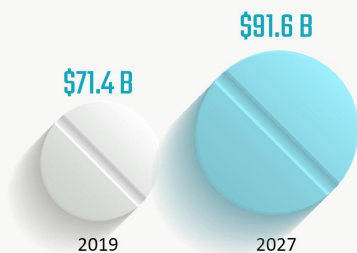


## Improving Pain reducing Abuse Introducing the Next Generation of Opioids

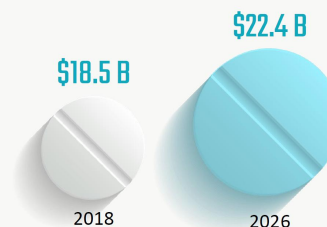


## Market Opportunity

### Global Pain Management Drugs Market



### Global Opioids Market



1) Allied Market Research 2) Allied Market Research

# Extensive Patent Portfolio

Ensysce has over 100 patents currently issued in 25 countries, ensuring opportunity to address abuse globally

- Technology well-protected by a suite of patents generated from over \$100 million of research support
- Patents provide protection to the underlying molecules, pharmaceutical preparations and method of use of both immediate and extended-release TAAP/MPAR prodrugs
- Substantial patent pipeline with a number of new products in development, a library of trade secrets and trademarks
- Opportunity to partner globally

## Issued Patent Countries



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# TAAP™

TRYPsin-  
ACTIVATED  
ABUSE  
PROTECTION

## IMPROVED TAMPER-PROOF DELIVERY PLATFORM

TAAP - 2-step verification mechanism to improve oral delivery, with release of active ingredient only in the small intestine with exposure to trypsin

TAAP chemical modification

TAAP is only activated by trypsin

TAAP not altered by manipulation

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## TAAP

### Two-Step Release Process

#### Step 1: Swallow drug

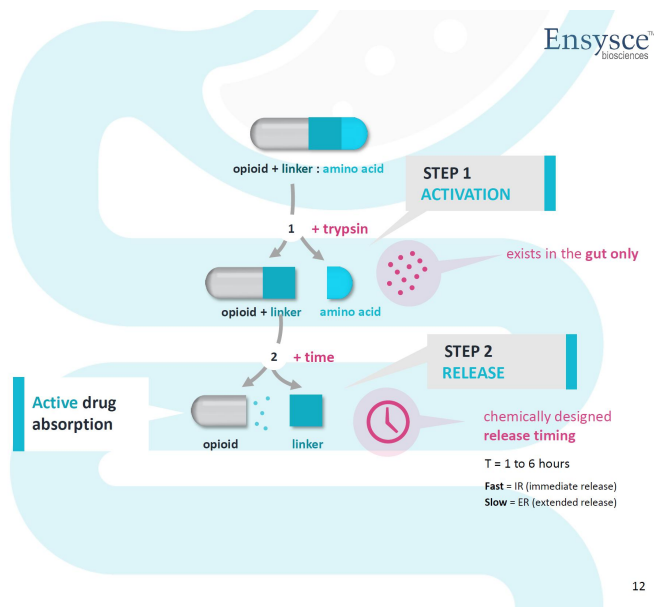
- Following ingestion, the drug is activated only after exposure to trypsin, a digestive enzyme that is active only in the small intestine.

#### Step 2: Timing chemically controlled

- A second step is required for full release of the active drug. The chemistry controls the rate of release, thereby making the Ensysce 2-step approach superior to other prodrug products.

#### Protects from:

- Chewing
- Crushing and snorting
- Crushing and injecting



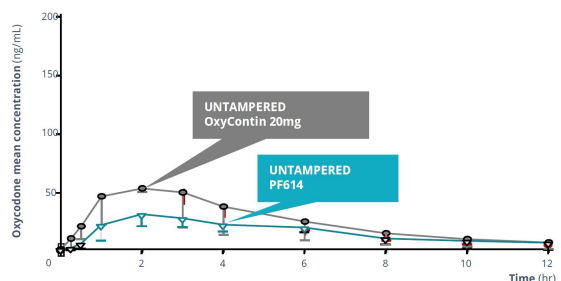
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## PF614: TAAP delayed release oxycodone prodrug

### Release kinetics cannot be altered

- Unlike OxyContin, Ensysce's opioid PF614, even when crushed, has no altered release kinetics
- In Phase I studies have been able to dose match PF614 to marketed OxyContin dose units.

Pre-clinical Blood Concentration of Opioid Vs. Time (dog)



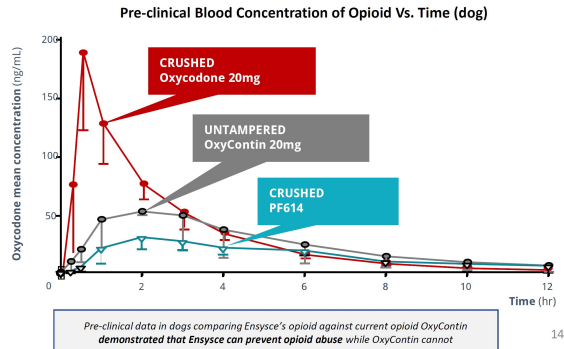
Pre-clinical data in dogs comparing Ensysce's opioid against current opioid OxyContin demonstrated that Ensysce can prevent opioid abuse while OxyContin cannot

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# MPAR™

MULTI-  
PILL  
ABUSE  
RESISTANT

## SMART ANTI-OVERDOSE PLATFORM

MPAR™ is a smart anti-overdose platform that is designed to protect patients from overdosing when it is combined with TAAP opioids.

MPAR™ is only triggered by an overdose

MPAR™ inhibits trypsin activation step

Using a prescribed dose gives pain relief\*

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## MPAR™ Mechanism of Action

### Combination Product With Dose-Triggered Trypsin Inhibition

MPAR™ Combination Product Legend:



**PRESCRIBED DOSE**

No Interference when normal dose taken; Low dose of trypsin inhibitor (nafamostat) does not affect release of the opioid

**SUB-THRESHOLD**

trypsin inhibitor



Trypsin activation releases free and active drug product

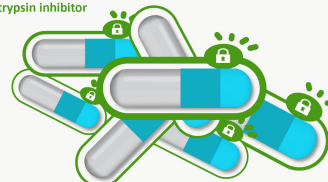
**ABOVE THRESHOLD**

trypsin inhibitor



**ACCIDENTAL OVERDOSE**

A higher amount of MPAR /more nafamostat begins to inhibit trypsin activity, limiting opioid release



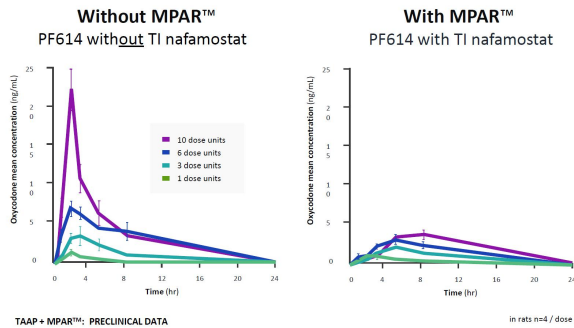
**EXCESS MPAR DOSE**

Trypsin Activation blocked / overdose averted

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# PF614-MPAR™

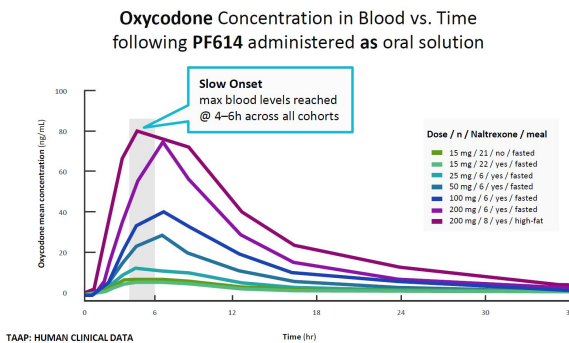
Blocks activation of PF614 and Oxycodone Release if Overdosed



- Combination product of PF614 with an ultrapotent trypsin inhibitor, nafamostat
- Taken at prescribed doses there is no change in oxycodone release from PF614
- With increasing dose unit administration, increasing amounts of nafamostat blocks trypsin activation of PF614 and prevents opioid overdose
- PF614-MPAR™ entered Phase 1 clinical trial in December 2021
- Data expected H2 2022

# PF614-101

Designed for Safer, More Efficient & Longer-Lasting Pain Relief



## PF614-101 Phase 1

- PF614 provides slow onset with maximum blood concentration reached at 4 to 6 hr after swallowing;

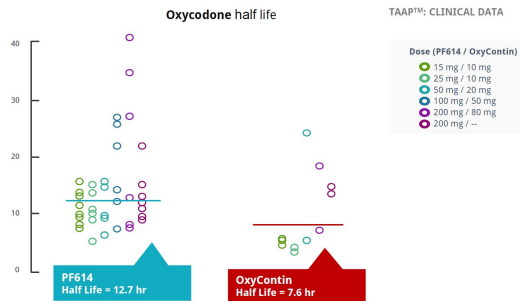
## Good Safety Profile

- PF614 has shown no unexpected adverse events in Phase I

## Efficient conversion to oxycodone

- PF614 is effectively converted to Oxycodone after it is swallowed providing dose equivalency in a ratio of 2.5:1 PR614:OxyContin.

# PF614 LONGER LASTING COMPARED TO OXYCONTIN



## PF614-101Phase 1

- Ensysce's opioid **PF614's half-life is 12.7 hours**, versus OxyContin's 7.6 hours
- As a result, Ensysce's PF614 is more convenient for the patient, since PF614 needs to be taken only **twice-a-day**, in contrast to OxyContin (which some patients end up taking **three times per day**)

1  
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## PF614 Clinical Status

- **PF614-102**
  - Multi-ascending dose/Bioequivalence study in healthy volunteers; MAD Data reported 05/05/22; BE data expected Q2 2022.
- **PF614-103**
  - Human abuse liability study via intranasal administration. Study initiation Q2 2022. Data expected Q3 2022.
- **PF614-104**
  - Human abuse liability study via oral administration. Study initiation expected Q3 2022. Data expected Q1 20 23.
- **PF614-MPAR-101**
  - PF614 administered alone or in combination with nalfamostat; Cohort 1 data reported 05/05/22; Full data expected Q4 2022.

**PF614**  
Clinical studies in progress

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## NEW DATA: PF614-102 MAD/BE Multi-Ascending Dose Study

**A Phase 1b, Randomized, 2-Part Single-Center Study to Evaluate the Pharmacokinetics and Safety of Multiple-Ascending Oral Doses of PF614 and the Food Effect and Bioavailability/Bioequivalence of Single Oral Doses of PF614 Relative to OxyContin in Healthy Adult Subjects**

### The primary objectives of the study are:

To assess the safety, tolerability and pharmacokinetics of intact prodrug, PF614, as well as oxycodone,

### Administration

Oral twice daily (BID) doses for 5 days to groups of healthy adult subjects, naltrexone blocked

### 3 Ascending Dose Cohorts

PF614	50 mg	n = 6	OxyContin	20 mg	n = 2
PF614	100 mg	n = 6	OxyContin	40 mg	n = 2
PF614	200 mg	n = 6	OxyContin	80 mg	n = 2

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# NEW DATA: PF614-102 MAD

## PF614 and OxyContin produce identical Adverse Events

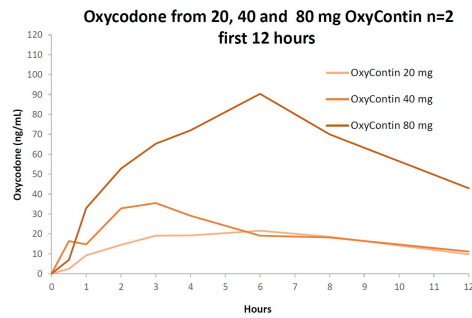
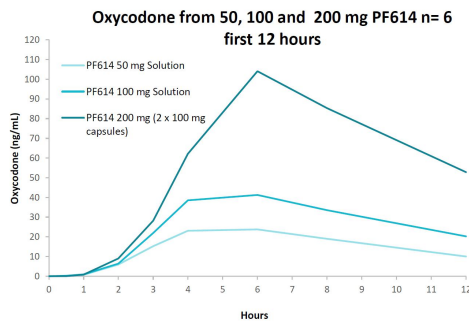
Table of Adverse Events

	PF614 50 mg n=6 n (%)	OxyContin 20 mg n=2 n (%)	PF614 100 mg n=6 n (%)	OxyContin 40 mg n=2 n (%)	PF614 200 mg n=6 n (%)	OxyContin 80 mg n=2 n (%)
Total subjects with at least 1 TEAE*	2 (33.3)	1 (50.0)	1 (16.7)	1 (50.0)	6 (100.0)	2 (100.0)

\* Treatment Emergent Adverse Events: Vertigo, Photophobia, Nausea, Constipation, Diarrhea, Vomiting Urinary Tract infection, Tooth fracture, Decreased appetite, Dizziness, Headache, Depressed mood, Rhinorrhoea, Dermatitis

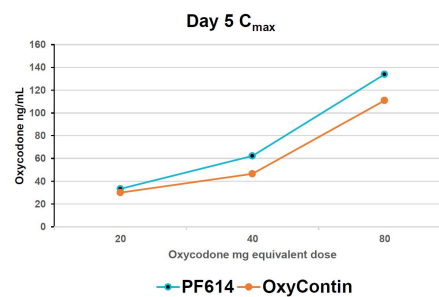
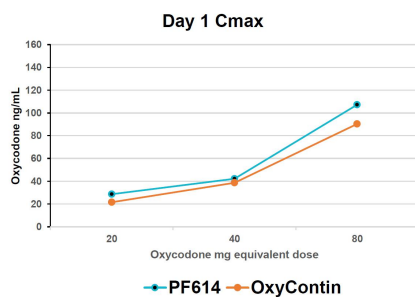
# NEW DATA: PF614-102 MAD

## PK of oxycodone release from PF614 or OxyContin



# NEW DATA: PF614-102 MAD

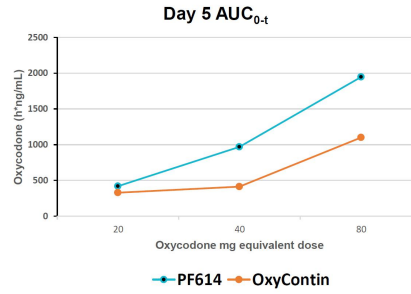
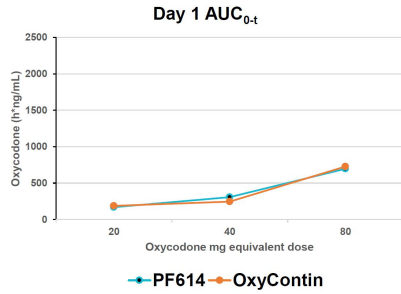
## Oxycodone from OxyContin or PF614 C<sub>max</sub>





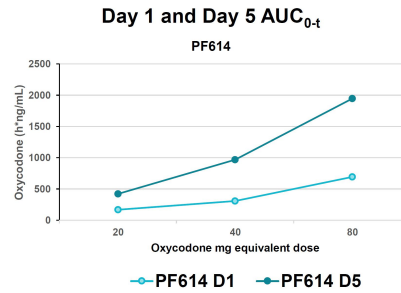
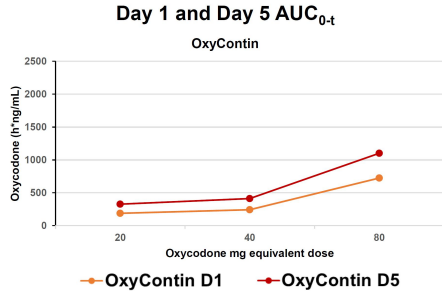
# NEW DATA: PF614-102 MAD

## Oxycodone from OxyContin or PF614 $AUC_{0-t}$



# NEW DATA: PF614-102 MAD

## Oxycodone from OxyContin or PF614 $AUC_{0-t}$



# NEW DATA: PF614-MPAR-101

## PF614 (25 mg) with and without nafamostat (10 mg)

**A Single Dose Study to Evaluate the Pharmacokinetics of Oxycodone and PF614 when PF614 Solution is Co Administered with Nafamostat, as an Immediate Release Solution and/or Extended Release (ER) Capsule Formulations in Healthy Subjects**

The primary objectives of the study are:

To assess the pharmacokinetics (PK) of oxycodone, when PF614 solution is administered alone and with nafamostat as an immediate-release (IR) solution and/or extended-release (ER) capsule prototypes

**Administration**

Single oral dose of PF614 (25 mg) with or without Nafamostat IR/ER or a combination (10 mg total) to groups of healthy adult subjects

**Cohort 1**

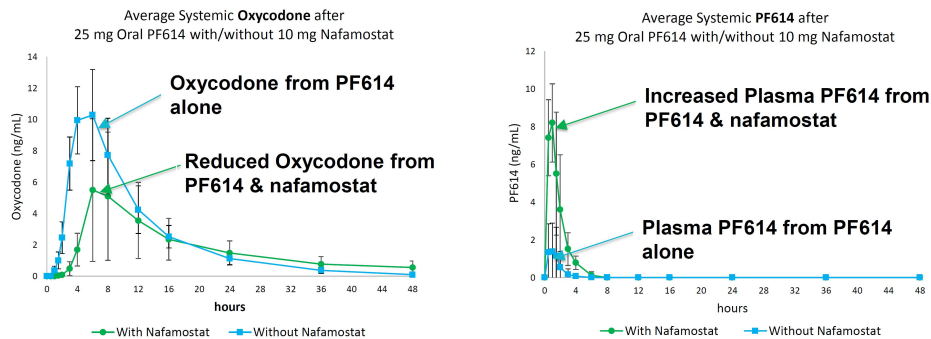
PF614 25 mg n = 8

PF614 25 mg and nafamostat 10 mg n = 6

# NEW DATA: PF614-MPAR-101

## PF614 (25 mg) with and without nafamostat (10 mg)

**First Demonstration of Human Overdose Protection:**



**NEXT STEPS:** Optimization of PF614 + nafamostat combination product = MPAR

## CASH RESOURCES

**\$8.4M**  
Cash  
as of 3/31/22

**\$4.1M**  
Grant Funding  
as of 3/31/22

**\$2.8M**  
New Grant  
Funding  
Expected in July

### NIH support

**2018**  
NIDA awarded Ensysce up to \$12M grant to progress MPAR™

Four-year award to undertake the pre-clinical and clinical development of the company's opioid overdose protection platform MPAR™ (Multi Pill Abuse Resistance).

### NIDA grant

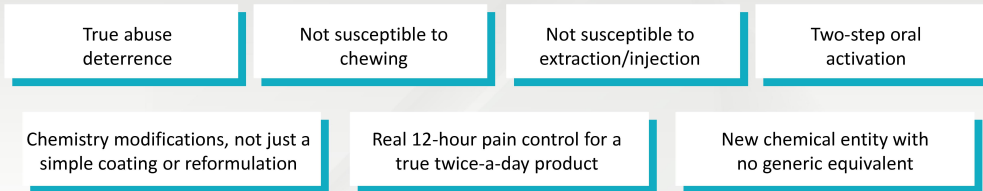
**2019**  
NIDA awarded Ensysce up to \$15M grant to progress TAAP/MPAR™ for OUD

Five-year award to undertake the pre-clinical and clinical development of the company's TAAP and MPAR™ for treatments of Opioid Use Disorder.

# Lead Product PF614

## Advantages over Abuse-Deterrent Formulations: OxyContin

### PF614 Properties



### ADF Opioids

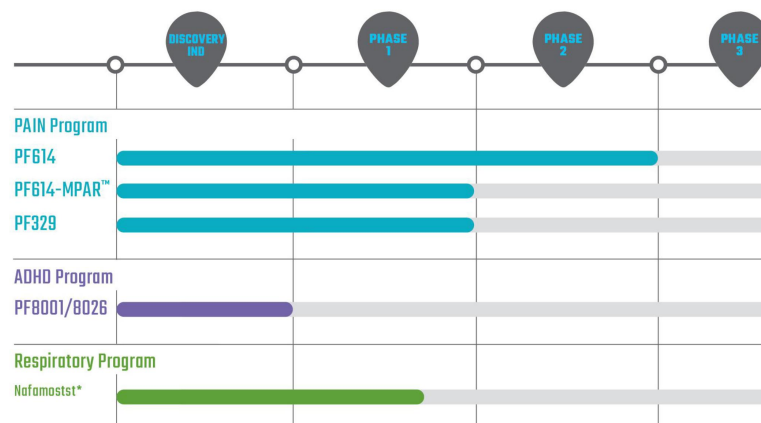
ADF opioids fall short, offering abuse deterrence without the additional benefits of PF614

# PF614: Development Plans

- ✓ **505(b)(2) Regulatory Path**
  - Helps avoid unnecessary duplication of studies already performed on a previously approved drug if bioequivalence can be demonstrated, reducing time and cost for development.
- ✓ **FDA FAST TRACK**
  - Allowing rolling NDA submission and more access to discussions with agency
- ✓ **Clinical Development**
  - Completion of BE Study 06/22; Data H1 2022
  - Human Abuse liability study (nasal) initiation 05/17/22; Data Q3 2022
  - Human Abuse liability study (oral) initiation Q1 2023
  - Phase 3 plans in discussions with the FDA
- ✓ **CMC and Non-clinical studies ongoing**
  - In parallel with clinical development

**PF614**  
A Next Generation Opioid For  
Severe Pain

# Diversified Pipeline



TAAP and MPAR™ platforms with 50(b)(2) regulatory development path  
 \*Nafamostat in development for MPAR, infections and respiratory diseases  
 HAL: Human Abuse Liability clinical study

# Management Team

Highly Motivated, Experienced Team with Proven Record



**D. Lynn Kirkpatrick, PhD**  
Chief Executive Officer

- Co-founded 2 start up companies
- Developed three targeted small molecule oncology drugs from discovery to clinic
- Experience in private and public company raising funds from private, public and government sources



**David Humphrey, CPA**  
Chief Financial Officer

- Extensive experience in entrepreneurial environments
- Multiple equity and debt financing, including IPOs
- Focused on financial infrastructure, internal controls with merger and acquisition strategies



**Geoff Birkett**  
Chief Commercial Officer

- Large pharma leadership experience
- Launched 5 major market-leading brands, including:
  - Nicorette
  - Prozac
  - Seroquel
  - Zomig



**Linda Pestano, PhD**  
Chief Development Officer

- Experienced in the design of pre-clinical programs focused on building IND-enabling data packages for lead candidate compounds intended for the treatment or diagnosis of cancer and inflammatory diseases
- PhD in Immunology from Tufts, Postdoctoral Research at Dana Farber, Harvard Medical School



**Nily Osman, MD**  
Chief Medical Officer

- Board certified neurologist and headache/pain specialist
- Over 10 years of pharma industry experience creating and delivering complex medical affairs and clinical development plans within multiple therapeutic areas including orphan disease indication.



**Richard Wright, MBA**  
Chief Business Officer

- Background in Intellectual Property monetization, banking, venture capital
- Co-founder of an immunology biotech company, later sold to private equity



**Jeffrey Millard, PhD**  
Chief Operating Officer

- Industrial experience in CMC (chemistry, manufacturing, and controls)
- 7 IND submissions (CDER, CBER, and IMPDs); directed CMC efforts from discovery, in-licensing to commercial launch
- PhD in Pharmaceutical Sciences from University of Arizona



# Clinical Advisory Board Pain, Addiction and Abuse Expertise



**Dr. Lynn Webster**  
Dr. Webster has dedicated more than three decades to becoming an expert in the field of pain management



**Dr. Jeffrey Gudin**  
Dr. Gudin is Faculty Dept of Anesthesiology/Pain Management, Univ of Miami, and Co-Editor of Practical Pain Management.



**Dr. Richard Dart**  
Dr. Dart is the Director of the Rocky Mountain Poison and Drug Center and specializes in emergency medicine and toxicology.



**Dr. William Schmidt**  
Over 25 years of pharma industry experience, with special emphasis on discovery/development of novel analgesic and narcotic antagonist drugs

# Board of Directors Business, Finance, Healthcare & Regulatory Expertise



**Dr. Lynn Kirkpatrick**  
Career focused on novel drug discovery and development



**Dr. Bob Gower**  
Seasoned Executive and Entrepreneur



**Andrew Benton**  
President Emeritus of Pepperdine University



**William Chang**  
Entrepreneur, Realty Company & Movie executive



**Dr. Adam Levin**  
Academic and clinical orthopedic surgeon at Johns Hopkins Univ.



**Steve Martin**  
Experienced Senior Executive and Chief Financial Officer



**Dr. Curtis Rosebraugh**  
Extensive FDA drug approval experience



**Lee Rauch**  
Experienced CEO and Strategy Advisor

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**TAAP™**  
Anti-abuse chemistry



**MPAR™**  
SMART Overdose protection

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Ensysce™  
biosciences

7946 Ivanhoe Avenue, Ste 201, La Jolla, CA 92037

## Investor Relations

Shannon Devine  
MZ North America  
203-741-8811  
[ENSC@mzgroup.us](mailto:ENSC@mzgroup.us)

[www.ensysce.com](http://www.ensysce.com)

