Corporate Investor Presentation
April 2024

## Safe Harbor Statement

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS
This document contains forward-looking statements concerning TFF Pharmaceuticals, Inc. ("TFF", "TFF Pharmaceuticals", the "Company," "we," "us," and "our"). The words "believe," "may," "will," "potentially," "estimate," "continue," "anticipate," "intend," "could," "would," "project," "plan," "expect" and similar expressions that convey uncertainty of future events or outcomes are intended to identify forward-looking statements. These forward-looking statements include, but are not limited to, statements concerning the following:

- the benefits of our TFF platform;
- advancement of TFF TAC and TFF VORI into potentially registration-enabling studies;
- TFF TAC's and TFF VORI's substantial market opportunity;
- the expectation that the further data from the ongoing Phase 2 clinical trial for TFF TAC and TFF VORI will be consistent with the data readouts for each product candidate to date; and
- our exploration of strategic alternatives for TFF VORI, including partnering opportunities, collaborations, and government-based funding sources.

Those forward-looking statements involve known and unknown risks, uncertainties and other factors that could cause actual results to differ materially. Among those factors are: (i) the risk that the further data from the ongoing Phase 2 clinical trials for TFF TAC and TFF VORI will not be favorably consistent with the initial data readouts, (ii) the risk that we may not be able to advance to registration-enabling studies for TFF TAC, (iii) the risk we may not be successful in our pursuit of strategic alternatives for TFF VORI; (iv) success in early phases of pre-clinical and clinicals trials do not ensure later clinical trials will be successful; (v) no drug product incorporating the TFF platform has received FDA pre-market approval or otherwise been incorporated into a commercial drug product, (vi) the Company has no current agreements or understandings with any large pharmaceutical companies for the development of a drug product incorporating the TFF platform, (vii) the risk that the Company may not be able to obtain additional working capital with which to continue the Phase 2 clinical trials and or advance to the initiation of registration-enabling studies, for TFF TAC as and when needed and (viii) those other risks disclosed in the section "Risk Factors" included in the Company's Annual Report on Form 10-K filed with the SEC on March 28, 2024 and subsequently filed reports. TFF Pharmaceuticals cautions readers not to place undue reliance on any forward-looking statements. TFF Pharmaceuticals does not undertake, and specifically disclaims, any obligation to update or revise such statements to reflect new circumstances or unanticipated events as they occur, except as required by law.
This document contains only basic information concerning TFF. Because it is a summary it does not contain all of the information you should consider before investing. Please refer to our reports and registration statements on file with the SEC for more comprehensive information concerning TFF Pharmaceuticals.

## Investment Highlights

```
Thin Film Freezing (TFF)
```


## Strong Internal

Pipeline

Positive Initial Clinical Data

Broadly Applicable Platform

- Unique technology for generation of dry powder formulations optimized for inhalational delivery
- Driving efficacy and minimizing systemic toxicities
- Over 170 patents issued or pending
- TFF TAC (Tacrolimus Inhalation Powder) for lung transplantation with $>\$ 2$ billion annual peak sales potential
- TFF VORI (Voriconazole Inhalation Powder) for serious pulmonary fungal infections with >\$1 billion annual peak sales potential
- Recent data supports Company moving into registration enabling trials
- Favorable efficacy, safety and tolerability in both programs
- Both programs qualify for 505(b)2 pathway
- Created dry powder formulations for a variety of small and large molecules
- Significant number of collaborations in place


Lower efficacy, Higher adverse events
Inhaled


## Thin Film Freezing Process



TFF technology enables the generation of dry powder formulations optimized for inhalational delivery via an easy-to-use dry powder inhaler

## Inhalation Device for Lung Deposition

## Bulk drug

 materialBrittle matrix
powder


Commercial dry powder inhaler


Removal of protective cap

Open mouthpiece to access capsule housing

Insert capsule into housing

Close mouthpiece

Actuate pushbuttons to pierce the capsule and inhale


## Delivering Value with an Internal Pipeline

| ASSET | PLATFORM | INDICATION | PRECLINICAL | PHASE 1 | PHASE 2 | PHASE 3 | ACHIEVED MILESTONES |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TFF TAC | Tacrolimus inhalation powder | Prophylaxis of organ rejection in lung transplant |  |  |  |  | Positive initial P2 data reported Dec 2023 Additional P2 data reported in March 2024 |
| TFF VORI | Voriconazole inhalation powder | Serious pulmonary fungal infections |  |  |  |  | Positive initial P2 data reported Dec 2023 Additional P2 data reported in March 2024 |

- $\geq \$ 2$ billion market opportunity for TFF TAC ${ }^{1}$
- $\geq \$ 1$ billion market opportunity for TFF VORI ${ }^{1}$
- $>70$ granted U.S. and ex-U.S. patents and patent applications for TFF TAC and TFF VORI with patent term extending to 2043


## TFF TAC Clinical Development

Tacrolimus Inhalation Powder Program

## TFF TAC: Addressing Significant Unmet Need in Lung Transplant Rejection

TFF TAC is in Phase 2 development for prevention of rejection in lung transplant recipients

- Tacrolimus is first-line calcineurin inhibitor for prevention of rejection in lung transplant
- Significant toxicities associated with oral tacrolimus
- TFF TAC delivers tacrolimus directly to the lung to drive efficacy through immune suppression locally in the lung, where inflammation leads to rejection and allograft failure, while limiting systemic exposure thus systemic toxicities
- High unmet medical need with $\mathbf{\sim 5 0 \%}$ mortality in $\mathbf{5}$ years ${ }^{1}$ due to narrow therapeutic index:
- Too little immune suppression leads to acute rejection or chronic rejection leading to chronic lung allograft dysfunction (CLAD)
- Too much immune suppression leads to infections, chronic kidney disease, and post transplant lymphoproliferative disease
$\quad \sim 40,000$ new and existing patients worldwide ${ }^{2}$
$\geq \$ 2$ billion peak TFF TAC global gross sales forecast ${ }^{3}$

TFF TAC is intended to increase lung delivery to drive efficacy while minimizing systemic exposures and toxicities

## TFF TAC: Phase 2 Australia Trial Design in Lung Transplant Patients

- Design: Open label study of TFF TAC in lung transplant patients who require reduced tacrolimus blood levels due to kidney toxicity
- Duration: Part A: 12 weeks; Part B: optional safety extension
- Endpoints: Safety and tolerability, kidney function, acute allograft rejection



## TFF TAC: Baseline Characteristics and Demographics

| Patient | Age <br> (years) | Sex | Race | Years since <br> transplant | CLAD | Years with <br> kidney disease | Time on TFF Tac <br> (weeks) | Disposition |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Pt 1 | 73 | M | W | 9 | No | 5 | 49.0 | Chose to proceed to Part B |
| Pt 2 | 73 | F | W | 8 | No | 6 | 40.0 | Chose to proceed to Part B |
| Pt 3 | 68 | M | W | 5 | No | 4 | 33.0 | Chose to proceed to Part B |
| Pt 4 | 67 | F | W | 3 | No | 2.5 | 20.0 | Chose to proceed to Part B |
| Pt 5 | 64 | M | W | 3 | No | 2.5 | 11.9 | Still in Part A |
| Pt 6 | 52 | F | W | 23 | No | 7 | 9.0 | Still in Part A |
| Pt 7 | 41 | F | W | 0.75 | No | N/A | 5.9 | Still in Part A |
| Pt 8 | 56 | M | NH | 1.25 | No | N/A | 5.0 | Still in Part A |

CLAD: chronic lung allograft dysfunction
W: white ; F: female; M: male; NH: Native Hawaiian
N/A: not available

## TFF TAC: Total Patient Exposure



## TFF TAC: Data suggest TFF TAC prevents rejection at reduced systemic exposure

## Efficacy

- Successful transition of 8/8 patients from oral Tacrolimus to TFF TAC
- No evidence of acute rejection
- No signs and symptoms suggestive of acute rejection
- No use of pulse corticosteroids for treatment of rejection
- No spirometry deterioration suggestive of acute rejection
- No chest x-ray findings suggestive of acute rejection
- Biomarker data to be disclosed in late April 2024
- 4/4 patients who completed Part A chose to remain on TFF TAC and proceeded to Part B


## Safety

- No mortality
- No TFF TAC discontinuation due to an AE
- Majority of TEAEs were Grade 2 or lower in severity
- Maintenance of kidney function


## Key Takeaways

- Interim clinical data suggest:
- Lower doses of TFF TAC compared to oral Tacrolimus are sufficient to prevent rejection.
- TFF TAC prevents rejection at reduced systemic Tacrolimus blood levels, thus lowering the risk of systemic toxicity.

| Mean Stable TFF TAC Dose / <br> Mean Stable oral Tacrolimus Dose | Stable Trough Tacrolimus Blood Levels: <br> TFF TAC / Oral Tacrolimus |
| :---: | :---: |
| $\sim 1 / 6(\sim 17 \%)$ | $\sim 2 / 3(\sim 66 \%)$ |

[^0]
## TFF VORI Clinical Development

Voriconazole Inhalation Powder Program

PHARMACEUTICALS

## TFF VORI: Addressing Significant Unmet Need in Pulmonary Fungal Infections

TFF VORI is in Phase 2 development for the treatment of pulmonary fungal infections including invasive pulmonary aspergillosis (IPA)

- IPA primarily impacts immune compromised patients (hematologic malignancies, solid organ, and stem cell transplant recipients)
- Oral and intravenous voriconazole is first-line therapy for the treatment of IPA
- Narrow therapeutic window associated with oral and IV voriconazole
- Significant toxicities
- Liver toxicity, arrhythmias and QT prolongation, infusion related reactions, visual disturbances, severe cutaneous adverse reactions, photosensitivity and renal toxicity ${ }^{1}$
- Drug-drug interactions
- High unmet medical need with $\sim 30 \%$ mortality in 12 weeks ${ }^{2}$ due to high rate of toxicity and drug-drug interactions limiting systemic dosing and overall efficacy
$\sim 250,000$ invasive aspergillosis (IA) patients worldwide ${ }^{3}$
$\geq \$ 1$ billion peak TFF VORI global gross sales forecast ${ }^{4}$

TFF VORI is intended to increase lung delivery to drive efficacy while minimizing systemic exposures, toxicities, and drug-drug interactions

## TFF VORI: Phase 2 Trial Design in Patients with Invasive Pulmonary Aspergillosis

- Design: Open label randomized study; TFF VORI vs. oral voriconazole
- Duration: 13 weeks of treatment
- Endpoints: Safety/tolerability, clinical response, radiologic response, mycologic response, all-cause mortality



## TFF VORI: Expanded Access Program (EAP)

- The Expanded Access Program (EAP) enrolls patients with the following diagnoses who have limited or no other treatment options or who have had an unfavorable response to adequate standard of care therapy:
- Pulmonary aspergillosis:
- Invasive pulmonary aspergillosis (IPA)
- Chronic pulmonary aspergillosis (CPA)
- Allergic bronchopulmonary aspergillosis (ABPA)
- Aspergillus tracheobronchitis
- Aspergillus bronchoanastomotic infection
- Voriconazole responsive pulmonary fungal infections
- US expanded access protocol prepared and submitted to the FDA: https://clinicaltrials.gov/ct2/show/NCT05897294
- Available in the US, Canada, Australia, UK, and select EU countries


## TFF VORI: Summary of Results

IPA is a pulmonary fungal infection with $\sim 30 \%$ mortality in 12 weeks

## Efficacy

- Of the six patients treated for at least 12 weeks with TFF VORI:
- Five patients achieved a clinical response (improvement in signs, symptoms and/or spirometry)
- Five patients achieved a mycologic response (presumed or proven)
- Three of four patients achieved a radiologic response (4 patients with abnormal baseline and follow up chest CT)
- No need for continued anti-fungal use after treatment with TFF VORI in all six patients


## Safety

- Of the 8 patients treated with TFF VORI for any length of time with follow-up safety data:
- No IPA-related mortality
- No all-cause mortality
- One TFF VORI discontinuation due to an unrelated AE of COVID infection that required intubation
- Majority of TEAEs deemed unrelated to TFF VORI
- Majority of TEAEs were Grade 2 or lower in severity
- No hepatic toxicity
- No visual disturbances

PHARMACEUTICALS

## TFF VORI: Patient TFF VORI 4 (EAP)

50-yr-old white male lung transplant recipient with CLAD presented with moderate cough, dyspnea (shortness of breath) and respiratory insufficiency and BAL* evidence of Scedosporium, which is voriconazole sensitive, and Lomentospora

| Patient | Treatment <br> duration | Clinical response |  | Mycologic response | Radiologic <br> response | All-cause mortality |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Improved signs <br> and symptoms | Stable or improved <br> spirometry | No evidence of <br> infection | Improved CT <br> findings |  |
| TFF VORI 4 | 24 weeks | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |

Total Symptom Scores


Follow up mycologic assessment:

- BAL* culture for Scedosporium negative


## TFF VORI: Patient TFF VORI 4 (EAP)

(a)

(b)

## Collaborations

Leveraging TFF's Platform for New Opportunities

## Recent Government Collaborations



Cleveland Clinic

June 26, 2023
TFF Pharmaceuticals awarded $\$ 2.97$ million by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institute of Health (NIH), to develop a universal influenza vaccine using the company's Thin Film Freezing technology.

May 4, 2023
TFF Pharmaceuticals enters into CRADA with the National Institute of Environmental Health Sciences (NIEHS) to develop dry powder formulations of Hyaluronan to prevent and treat respiratory diseases.

May 1, 2023
TFF Pharmaceuticals receives additional funding from Leidos to advance next generation countermeasures for military and healthcare personnel under the DARPA Personalized Protective Biosystems (PPB) program.

## Business Development Opportunities for TFF's Platform

## Internal Pipeline

- TFF VORI (inhaled voriconazole dry powder)
- TFF TAC (inhaled tacrolimus dry powder)
- Reformulation and development of new vaccines for intranasal and inhalational delivery and eliminating need for cold chain supply requirements


## Biologics

## New Chemical Entities (NCEs)

- Formulating new product opportunities for both small and large molecules


## Government

- CRADA agreements with USAMRIID to formulate dry powder neutralizing antibodies against national priority biodefense threats
- CRADA agreement with NIEHS to develop dry powder formulations of Hyaluronan to prevent and treat respiratory diseases
- LEIDOS/DARPA contract
- SBIR with NIAID, Cleveland Clinic, and University of Georgia


## Academia

- R\&D collaborations with the Albert Einstein College of Medicine, Georgia Tech, and UPenn to develop biologics
- mRNA
- mAbs
- sRNA
- Bacteriophages
- Peptides
- Peptoids


## TFF Leadership



## TFF Board and Advisors

## Board of Directors

Harlan F. Weisman, M.D.
Chief Executive Officer

## Thomas King

Director
Catherine Lee, J.D.
Director
Robert S. Mills
Director
Michael Patane, Ph.D.
Director
Brandi Roberts
Director
Stephen Rocamboli Director
(1) mitobridoe

Gohnson, ffohnson
Vivus

columbia LABORATORIES,INC.

LONGBOARD

CANDEL
therapeutics

## Scientific Advisory Board

Anthony Hickey, Ph.D.
Senior Scientific Advisor, and Chairman of the Scientific Advisory Committee

David N. Cornfield, M.D.
Professor of Pulmonary Medicine, Stanford University
Prof. David Denning, FRCP, FRCPath, DCH, FMedSci Professor of Infectious Diseases, University of Manchester

```
Jay Peters, M.D.
Chief of Pulmonary and Critical Care Medicine, University of Texas Health Science Center at San Antonio
```

Ted M. Ross, Ph.D.
Professor, Center for Vaccines and Immunology, Department of Infectious Diseases, University of Georgia

Mike Saag, M.D.
Professor of Medicine, University of Alabama at Birmingham
Drew Weissman, M.D., Ph.D.
Roberts Family Professor, Vaccine Research at the Perelman
School of Medicine, University of Pennsylvania

## Investment Highlights

```
Thin Film Freezing (TFF)
```


## Strong Internal

Pipeline

Positive Initial Clinical Data

## Broadly Applicable

 Platform- Unique technology for generation of dry powder formulations optimized for inhalational delivery
- Driving efficacy and minimizing systemic toxicities
- Over 170 patents issued or pending
- TFF TAC (Tacrolimus Inhalation Powder) for lung transplantation with $>\$ 2$ billion annual peak sales potential
- TFF VORI (Voriconazole Inhalation Powder) for serious pulmonary fungal infections with $>\$ 1$ billion annual peak sales potential
- Recent data supports Company moving into registration enabling trials
- Favorable efficacy, safety and tolerability in both programs
- Both programs qualify for 505(b)2 pathway
- Created dry powder formulations for a variety of small and large molecules
- Significant number of collaborations in place


Lower efficacy, Higher adverse events
Inhaled


Higher efficacy, Lower adverse events

THANK YOU

# TFF TAC Additional Information 

Preclinical Data, Phase 1 Study Design, and Phase 1 Data

## TFF TAC: Preclinical and Phase 1 provided safety, tolerability, and pharmacokinetic data and enabled Phase 2 planning

## Preclinical POC Data:

- Inhaled tacrolimus had similar efficacy compared to intramuscular tacrolimus in a rat lung transplant model
- Improved drug delivery to the lung

Phase 1 data:

- Successfully completed single and multiple ascending dosing of TFF TAC in healthy subjects in Phase 1 trial
- Doses up to 5 mg (single dose) and 1.5 mg (repeated dose) daily were generally well tolerated


## TFF TAC Preclinical Data - Improved Drug Delivery to the Lung



## Phase 1 Study Design

## Study Overview

## Design:

- Randomized, double-blind, placebocontrolled study of TFF TAC in 57 healthy adult volunteers
- Single ascending dose (SAD) and multiple ascending dose (MAD) phases


## Endpoints:

- Safety and tolerability
- Pulmonary function
- Pharmacokinetics

PART A:
SINGLE ASCENDING DOSE
$\mathrm{N}=32$ healthy volunteers
3:1 active to placebo in each group

PART B:
MULTIPLE ASCENDING DOSE
$\mathrm{N}=25$ healthy volunteers
3:1 active to placebo in each group


## Phase 1 Results Showed TFF TAC was Safe and Well-Tolerated



| Safety |  |
| :--- | :--- |
|  |  |
|  |  |
|  | Overall, TFF TAC was safe and well- <br> tolerated |
| $\checkmark$No dose-related increase in overall <br> treatment-emergent adverse events <br> (TEAEs) was observed |  |
|  |  |

TFF TAC demonstrated excellent safety and tolerability

## TFF VORI Additional Information

Preclinical, Phase 1, and Compassionate Use Data

## The Problem: Toxicity of IV and Oral Voriconazole

## Poor side effect profile

Side Effects:

- Hepatic toxicity, arrhythmias and QT prolongation, infusion related reactions, visual disturbances, severe cutaneous adverse reactions, photosensitivity and renal toxicity ${ }^{1}$
- Alternatives:

Oral and IV amphotericin B, echinocandins, and azoles, which are also limited by a narrow therapeutic window

Current SOC voriconazole has narrow therapeutic window ${ }^{2}$


## Preclinical Data of Inhaled Voriconazole

## Increased survival



Decreased necrotic lesions in the lung


# TFF VORI: Phase 1 studies and compassionate use data provided safety, tolerability, pharmacokinetic, and early efficacy data 

## Phase 1 Results:

- Phase 1a ( $n=65$ healthy volunteers) and Phase 1 b ( $n=16$ patients with mild stable asthma)
- Doses up to 80 mg twice daily were well tolerated and showed no signs of the toxicities previously reported for the oral or intravenous forms.


## Compassionate Use Results: Two lung transplant

 recipients with history of recurrent pulmonary fungal infections and toxicities to systemic available standard of care therapy. Following treatment with TFF VORI:- Lung function stabilized/maintained
- Lung lesions improved
- Aspergillus infection cleared
- No need for hospitalization
- No drug-drug interactions
- No adverse events reported




## Phase 1 Study Design

## Study Overview

## Design:

- Randomized, double-blind, placebocontrolled study of TFF VORI in 65 healthy adult volunteers
- Single ascending dose (SAD) and multiple ascending dose (MAD) phases


## Endpoints:

- Safety and tolerability
- Pulmonary function
- Pharmacokinetics


## SINGLE ASCENDING DOSE

$\mathrm{N}=33$ healthy volunteers
3:1 active to placebo in each group

## 10 mg TFF VORI

## PART B:

MULTIPLE ASCENDING DOSE
$\mathrm{N}=32$ healthy volunteers 3:1 active to placebo in each group BID dosing


80 mg TFF VORI

## Phase 1 Results Showed TFF VORI was Safe and Well-Tolerated

Multiple Ascending Dose Study Plasma Pharmacokinetics


## Safety

No clinically meaningful differences between TFF VORI and placebo in:
$\checkmark$ \% of patients with treatment emergent adverse events (TEAEs)
$\checkmark$ Safety laboratory test results, vital signs, and pulse oximetry
$\checkmark$ Pulmonary function tests, electrocardiograms, and eye examination

- Single and multiple doses of TFF VORI (10 mg, $20 \mathrm{mg}, 40 \mathrm{mg}$, and 80 mg ) were well tolerated
- No dose limiting toxicities
- Most TEAEs were Grade 1. There were no Grade 3 or higher TEAEs
- All TEAEs but one (headache) occurred in a single subject

TFF VORI showed 10-50-fold lower plasma exposure compared to oral with excellent safety and tolerability

## Compassionate Use: Patient 1

## Patient characteristics

- 50-year-old man
- Lung transplant in 2019, treated with tacrolimus
- Multiple prior fungal infections
- Unable to take systemic voriconazole due to prior skin cancers including melanoma
- Posaconazole discontinued due to systemic toxicity
- 6 hospitalizations over 12 months before treatment
- Treated with TFF VORI, 80 mg, BID for 6 months



## Decreased lesions



Patient's lung function stabilized; lung lesions improved with no evidence of drug-drug interaction

## Compassionate Use: Patient 2

## Patient characteristics

- 54-year-old woman
- Lung transplant in 1993, treated with tacrolimus
- Multiple prior fungal infections
- Prior treatment with systemic voriconazole and posaconazole
- Posaconazole discontinued due to systemic toxicities
- Treated with TFF VORI, 80 mg , BID for 13 weeks


Patient maintained stable lung function; experienced mycological cure in 6 weeks with no drug-drug interactions


[^0]:    Data is from TFF-T2-001 pre-database lock; Data cut off date: 3/8/24

