TITAN PHARMACEUTICALS

CORPORATE PRESENTATION | JANUARY 2018

© 2018 TITAN PHARMACEUTICALS INC. | NASDAQ:TTNP

TITAN PHARMACEUTICALS

FORWARD-LOOKING STATEMENTS

The presentation may contain “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Reference is made in particular to the description of our plans and objectives for future operations, assumptions underlying such plans and objectives and other forward-looking terminology such as “may,” “expects,” “believes,” “anticipates,” “intends,” “projects,” or similar terms, variations of such terms or the negative of such terms.

Forward-looking statements are based on management’s current expectations. Actual results could differ materially from those currently anticipated and such statements involve risks and uncertainties, including, but not limited to, those risks and uncertainties relating to the commercialization of Probuphine, the regulatory approval process, the development, testing, production and marketing of our drug candidates, patent and intellectual property matters and strategic agreements and relationships.

ProNeura is a trademark and Probuphine is a registered trademark of Titan Pharmaceuticals, Inc.

TITAN PHARMACEUTICALS

COMPANY SNAPSHOT

ProNeura™ drug delivery platform provides long-term, continuous, non-fluctuating medication levels

FDA approved Probuphine® (buprenorphine) implant: six-month maintenance treatment of opioid use disorder (OUD)

- US and Canada: Braeburn Pharmaceuticals (U.S. launch start - Q1 2017)
- Europe: Molteni Farmaceutici (Binding Term Sheet – Nov 2017/ License Agreement – expected Q1 2018)
  - Marketing Authorization Application (MAA) under review by the European Medicines Agency (EMA)

ProNeura Pipeline

- Parkinson's Disease: ropinirole implant in Phase 1/2 clinical study – expected completion by end 2018
- Collaborations / Feasibility evaluations:
  - OUD - Opioid antagonist implant: Opiant Pharmaceuticals
  - Chronic pain - Kappa opioid receptor agonist implant: JT Pharmaceuticals
  - Malaria prophylaxis - antimalarial drug implant: WRAIR and SWRI

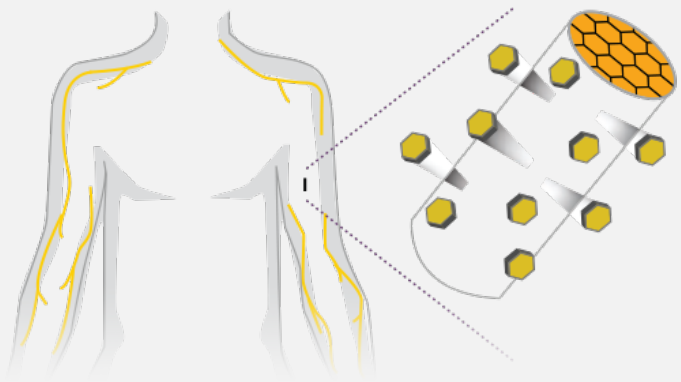
TITAN PHARMACEUTICALS

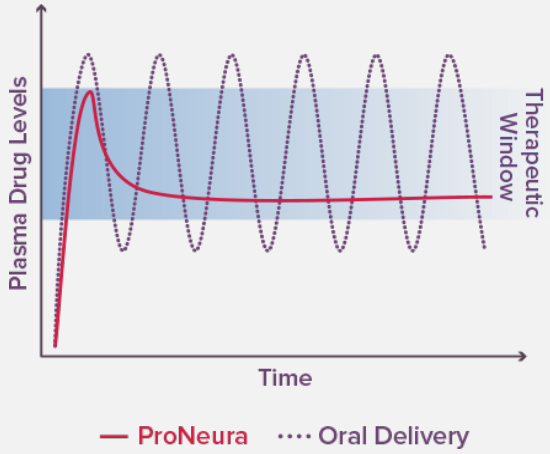
PRONEURA
LONG-TERM DRUG DELIVERY PLATFORM

- Active pharmaceutical ingredient (API) uniformly distributed throughout the ethylene vinyl acetate co-polymer (EVA) matrix
- No reservoir, therefore no risk of drug dumping
- Controlled rate of drug delivery and essentially 100% bioavailability
- Intellectual Property
  - Issued method of use patents for treatment of OUD with buprenorphine implant, and treatment of Parkinson's disease with a dopamine agonist implant
  - Advanced implant constructs – patent application prosecution in process

TITAN PHARMACEUTICALS

PRONEURA
MECHANISM OF ACTION

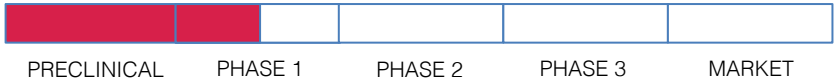
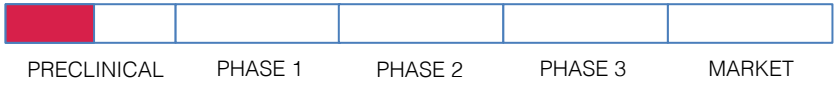




- Inserted subdermally
- Drug is released continuously into patient's body through the process of dissolution
- Results in a stable level of medication in the blood, avoiding peaks and troughs of oral dosing
- Round-the-clock long-term treatment (3-12 months) in outpatient setting

TITAN PHARMACEUTICALS

PRONEURA
PRODUCT PIPELINE

CANDIDATE	INDICATION	DEVELOPMENT STAGE
Probuphine (United States)	OUD	
Probuphine (European Union)	OUD	
Ropinirole Implant	Parkinson's Disease	
T3 Implant	Hypothyroidism	

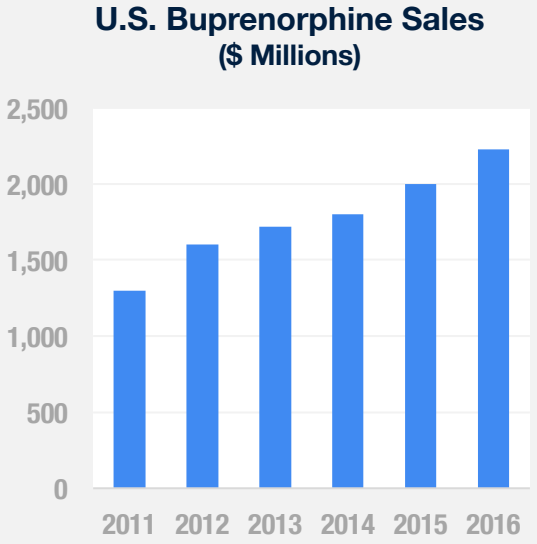
CANDIDATE	INDICATION	DEVELOPMENT STAGE	COLLABORATOR
Opioid Antagonist	OUD	Feasibility evaluation	Opiant Pharmaceuticals
Kappa Opioid Agonist	Chronic pain	Feasibility evaluation	JT Pharmaceuticals
Antimalarial Drugs	Malaria prophylaxis	Feasibility evaluation	WRAIR and SWRI

TITAN PHARMACEUTICALS

PROBUPHINE (BUPRENORPHINE) IMPLANT

FDA APPROVED FOR MAINTENANCE TREATMENT OF OPIOID USE DISORDER – MAY 2016

PATIENTS	Major epidemic: ~ 2.5 million people in U.S. affected
TREATMENT	Buprenorphine treatment is the gold standard
ADVANTAGES	Controls withdrawal symptoms and cravings without opioid euphoria; convenient outpatient treatment
CHALLENGES	Daily dosed formulations present various challenges: compliance, variable blood levels, diversion & abuse
OUR SOLUTION	Probuphine's non-fluctuating drug delivery over six months addresses all of the challenges of daily dosing; provides unique treatment option
POSITIONING	Uniquely positioned as a maintenance therapy for patients already in recovery



TITAN PHARMACEUTICALS

PROBUPHINE
U.S. COMMERCIAL LAUNCH INITIATED Q1 2017

Partnership with Braeburn Pharmaceuticals for U.S. and Canada*

- Tiered royalties on net sales of mid-teens to low 20s (%) - U.S. Patent term to April 2024
- Sales Milestones of up to $165 million
- Braeburn launched with 60+ field sales force and medical support staff focusing on 80+ key U.S. treatment centers
    - 2,500+ health care providers certified under REMS program and 70+ payors indicated coverage intention, including Medicare, Medicaid & VA programs
- Ongoing discussions with Braeburn, medical community and other experts to fully understand impediments to Probuphine's uptake and establish action plans to address issues

** Braeburn has sublicensed Canadian rights to Knight Therapeutics*

TITAN PHARMACEUTICALS

PROBUPHINE
EUROPEAN COMMERCIALIZATION PLANS

Advancing European opportunity for regulatory approval and commercial licensing:

- March/April 2017: EMA confirmed eligibility for review and approval under centralized procedure and granted pediatric indication waiver
- July 2017: received positive input at pre-MAA meetings from rapporteur (Ireland) and co-rapporteur (UK) country regulatory teams
- November 2017: MAA filed and accepted for review by EMA
- November 2017: executed binding term sheet with Molteni Farmaceutici of Italy to market Probuphine in Europe
    - € 2 million on execution of agreement – expected Q1 2018
    - € 4 million in additional milestones based on approval and key country registrations
    - Royalties starting at low teens and going to low twenty percentage of net sales

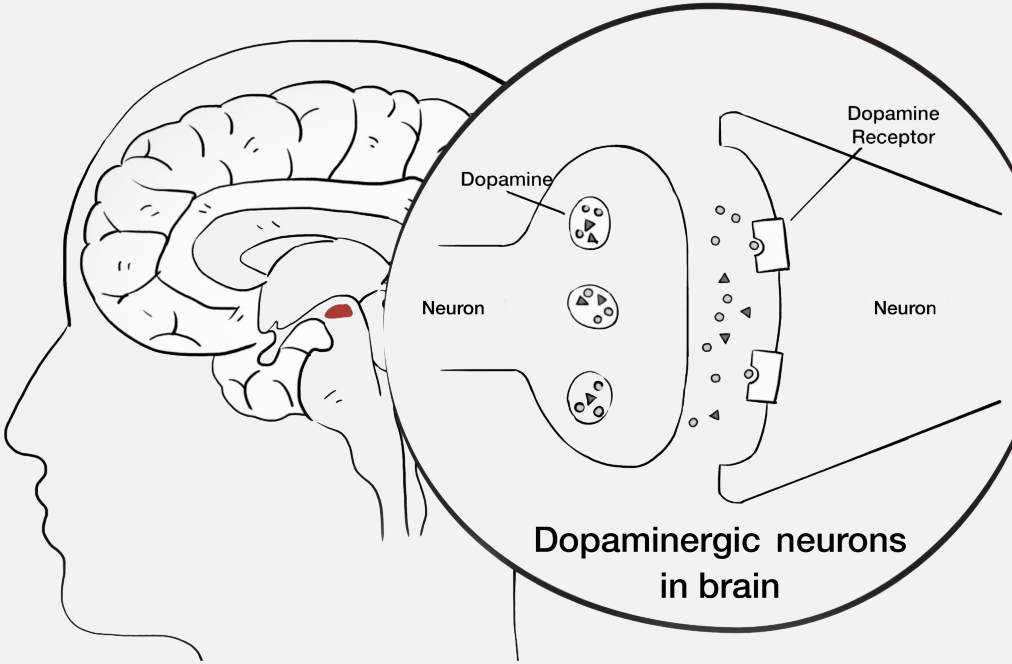
TITAN PHARMACEUTICALS

PARKINSON'S DISEASE (PD)
OVERVIEW

Characterized by the loss of dopamine, which alters activity in the brain region impacting movement and motor function

- Treated with drugs designed to replace or mimic dopamine in the brain
- After several years of daily dosed pulsatile treatment, these drugs can lose benefit and trigger serious side effects in up to 80% of patients

Continuous delivery of a dopamine agonist can provide a stable level of medication which may minimize side effects and improve ON time for patients



TITAN PHARMACEUTICALS

PARKINSON'S DISEASE
THERAPEUTICS MARKET

Sales of Dopamine Agonists, U.S.*			
Year	Total Sales	% DA	$ DA
2012	$1.1 Billion	26%	$286 Million
2022	$2.3 Billion	18%	$414 Million

Cost to American Society **

$14.4 Billion Annually

Treatment Costs $8.1 Billion	Indirect Costs $6.3 Billion

If costs continue to rise they will double by 2040

- As many as 1 million people in the U.S. affected
- That number is expected to almost double by 2030 due to aging of population
- About 60,000 newly diagnosed for PD annually
- More than 23,000 die from PD each year

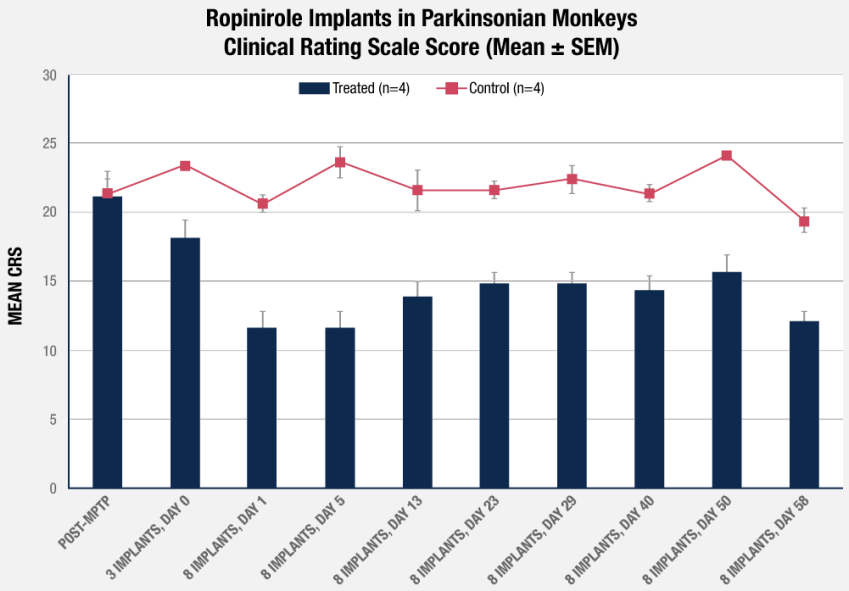
** GlobalData; **Parkinson's Action Network, National Center for Health Statistics; "The Current and Projected Economic Burden of Parkinson's Disease in the United States" Movement Disorders, March 2013*

Based on information from Titan and other sources believed to be reliable and prepared exclusively for Titan. Woodside Capital Partners is not responsible for any use that Titan may make of this material.

TITAN PHARMACEUTICALS

PRONEURA
PARKINSON'S DISEASE PROGRAM

Lower CRS Score =
Better Control of
Parkinson Symptoms



- Ropinirole (Requip®), a dopamine agonist marketed by GSK for PD
- Evaluated in a Parkinsonian animal model using ProNeura drug delivery platform
  - Results presented in June 2015 - 19th International Congress of Parkinson's Disease and Movement Disorders
    - Sustained plasma ropinirole levels for several months following implantation
    - No local skin irritation at implant site
    - Controlled PD symptoms without triggering dyskinesias

TITAN PHARMACEUTICALS

ROPINIROLE IMPLANT PROGRAM
EXPECTED 505(b)(2) REGULATORY PATHWAY

2017

Investigational New Drug Application cleared by FDA in late August 2017

The Phase 1/2 clinical study is an open label, sequential, dose escalation study in approximately 20 subjects with idiopathic Parkinson's disease at up to 4 sites

Patient screening commenced – September 2017

First patient treated – October 2017

STUDY GOALS

- Characterize pharmacokinetic profile of the ropinirole implants
- Evaluate safety and tolerability of up to 4 dose levels
- Explore potential signals of efficacy using established disease-specific assessment scales

2018

Data from the first patient cohort should be available in first half of 2018 following completion of the three-month treatment

Study completion is expected by the end of 2018

TITAN PHARMACEUTICALS

PRONEURA
OTHER OPPORTUNITIES

Opioid Use Disorder:

- Prevention of OUD relapse and overdose with an opioid antagonist
  - Collaboration with Opiant Pharmaceuticals
  - Formulation development and commercial assessment in progress with data available in 1H 2018

Chronic Pain:

- Treatment of chronic pain with a proprietary Kappa opioid receptor agonist
  - Collaboration with JT Pharmaceuticals
  - Potential to be non addictive treatment
  - Formulation development in progress with data available in 1H 2018

Malaria Prophylaxis:

- Collaboration with Walter Reed Army Institute of Research (WRAIR) and Southwest Research Institute (SWRI)
  - Anti-malarial drug implant to provide prophylactic treatment for personnel in malaria endemic regions
  - Initial non-clinical studies show positive results and formulation optimization in progress

Hypothyroidism:

- Liothyronine (LT3) implant to provide continuous, stable level of T3 to patients requiring long term oral T3 treatment
  - T3 implant formulation ready for pre-IND discussion and related testing

TITAN PHARMACEUTICALS
EXECUTIVE MANAGEMENT

Marc Rubin, M.D.
Executive Chairman & Director

- 11 years with Titan
- Former Head of Global R&D and member of the Board of Management at Bayer Pharma
- Executive R&D and commercial responsibilities at GSK for 13 years
- 28 years in the pharmaceutical industry following 7 years at NIH

Sunil Bhonsle, M.B.A.
President, CEO & Director

- 21 years with Titan
- 20 years with Bayer Corporation in Biological and Pharmaceutical finance and operations management

Kate Beebe, Ph.D.
Executive Vice President, Chief Development Officer

- 11 years with Titan
- 22 years in industry, with senior positions in clinical development and medical affairs at GSK, Merck, and Corcept Therapeutics
- 10 years in academic medicine

TITAN PHARMACEUTICALS

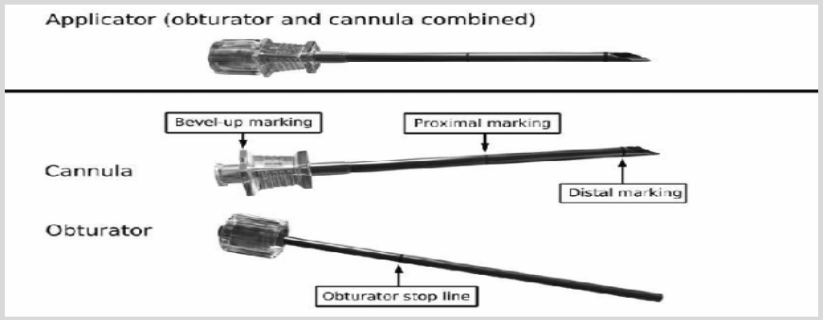
THANK YOU.
QUESTIONS?

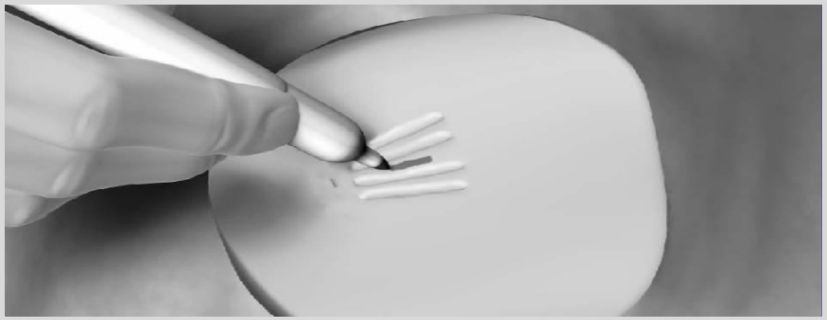
CORPORATE PRESENTATION | JANUARY 2018

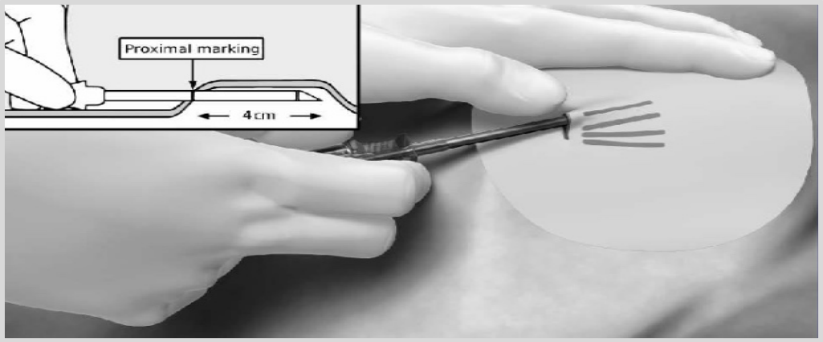
© 2018 TITAN PHARMACEUTICALS INC. | NASDAQ:TTNP

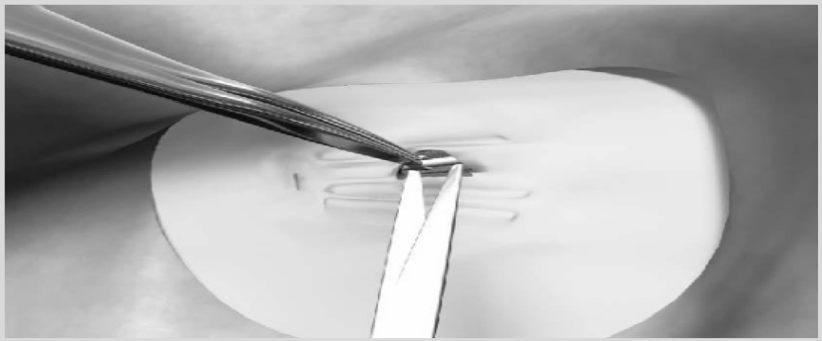
TITAN PHARMACEUTICALS

PROBUPHINE
RISK EVALUATION & MITIGATION STRATEGY









TITAN PHARMACEUTICALS

PROBUPHINE
RISK EVALUATION & MITIGATION STRATEGY

Training and Certification

Providers who prescribe and implant Probuphine are required to:

- Attend Live Training: Lecture and Practicum
- Complete the Probuphine REMS Program Knowledge Assessment
- Enrolled in the Probuphine REMS program
    - Providers who perform Probuphine surgical procedures must meet criteria for procedural competency
- Recertification is required after 12 months, prior to placement of any additional orders

Patient Counseling

- Patients are counseled regarding risks of accidental overdose, misuse, and abuse, and when they might need to contact their healthcare provider

Closed Distribution

- Probuphine is only available to healthcare providers who are certified in the Probuphine REMS Program