Corporate Overview

February 2018

NASDAQ:FPRX

Forward-Looking Statements Disclaimer

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as "may," "will," "expect," "plan," "anticipate" and similar expressions (as well as other words or expressions referencing future events or circumstances) are intended to identify forward-looking statements. These forward-looking statements reflect Five Prime's current beliefs and expectations. Each of these forward-looking statements involves risks and uncertainties. Actual results may differ from these forward-looking statements. Forward-looking statements contained in this presentation include statements about (i) the timing of initiation, progress and scope of clinical trials for our product candidates; (ii) the potential use of our product candidates to treat patients; (iii) the extent of gene amplification and protein overexpression in and the size of certain patient populations; (iv) the prevalence and incidence of certain diseases; (v) the timing of the filing of INDs; (vi) the timing of program updates and data disclosures; and (vii) our preliminary financial results for the fiscal year ended December 31, 2017.

Many factors may cause differences between current expectations and actual results, including unexpected safety or efficacy data observed during preclinical or clinical studies, clinical site activation rates or clinical trial enrollment rates that are lower than expected, changes in expected or existing competition, failure of our collaborators to support or advance collaborations or product candidates and unexpected litigation or other disputes. Other factors that may cause our actual results to differ from current expectations are discussed in Five Prime's preliminary prospectus supplement relating to the proposed offering and its other filings with the U.S. Securities and Exchange Commission, including the "Risk Factors" sections contained therein, as well as the risks identified in the registration statement and the preliminary prospectus supplement relating to the offering under the heading "Risk Factors." Except as required by law, we assume no obligation to update any forward-looking statements contained herein to reflect any change in expectations, even as new information becomes available.

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Five Prime in 2018 – Value Proposition

IND engine that is hard to copy and industry leading for discovery of I-O biologics

Rapidly expanding pipeline transitioning into late-stage development

History of value-creating collaborations; eligible to receive additional non-dilutive funding

The Five Prime Opportunity: Platform and Pipeline to Power Immuno-Oncology

Clinical pipeline expected to more than double from 2 to 5 candidates by EOY 2018

Cabiralizumab
CSF1R antibody

I-O:
- Phase 2 in 2nd-line pancreatic
- Phase 1a/1b in seven tumor settings
  - Including ~60 patients in late-line pancreatic

PVNS:
- Phase 2 ongoing

Bristol-Myers Squibb

Bemarituzumab (FPA144)
FGFR2b antibody
Initiation of FIGHT global Ph 1/3 trial in combo with chemo in first-line gastric

zai Lab™

FPA150
B7-H4 antibody

TIM-3
antibody
Bristol-Myers Squibb

FPT155
CD80-Fc

Discovery platform and capabilities that uniquely position us to identify new I-O targets and therapeutics

History of value-creating collaborations

Bristol-Myers Squibb
zai Lab™
gsk GlaxoSmithKline
ucb Pharma

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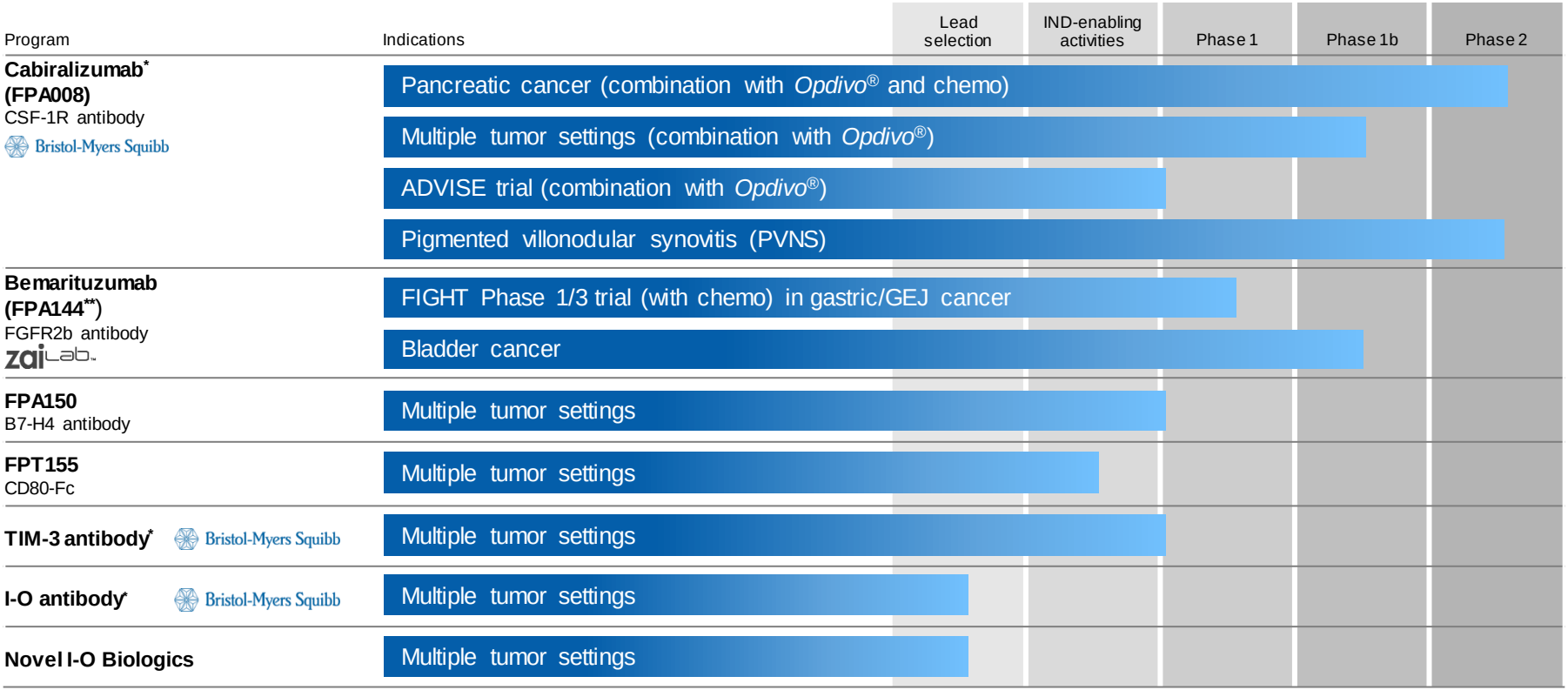
Oncology-Focused Pipeline with Multiple Clinical Candidates



* Partnered with Bristol-Myers Squibb Company (BMS) – see "Part I—Item 1. Collaborations" of our most recent Annual Report on Form 10-K for a description of the collaboration arrangement with BMS.
** Partnered with Zai Lab (Shanghai) Co., Ltd. (Zai) – see our Current Report on Form 8-K filed with the SEC on December 19, 2017 for a description of the collaboration arrangement with Zai.

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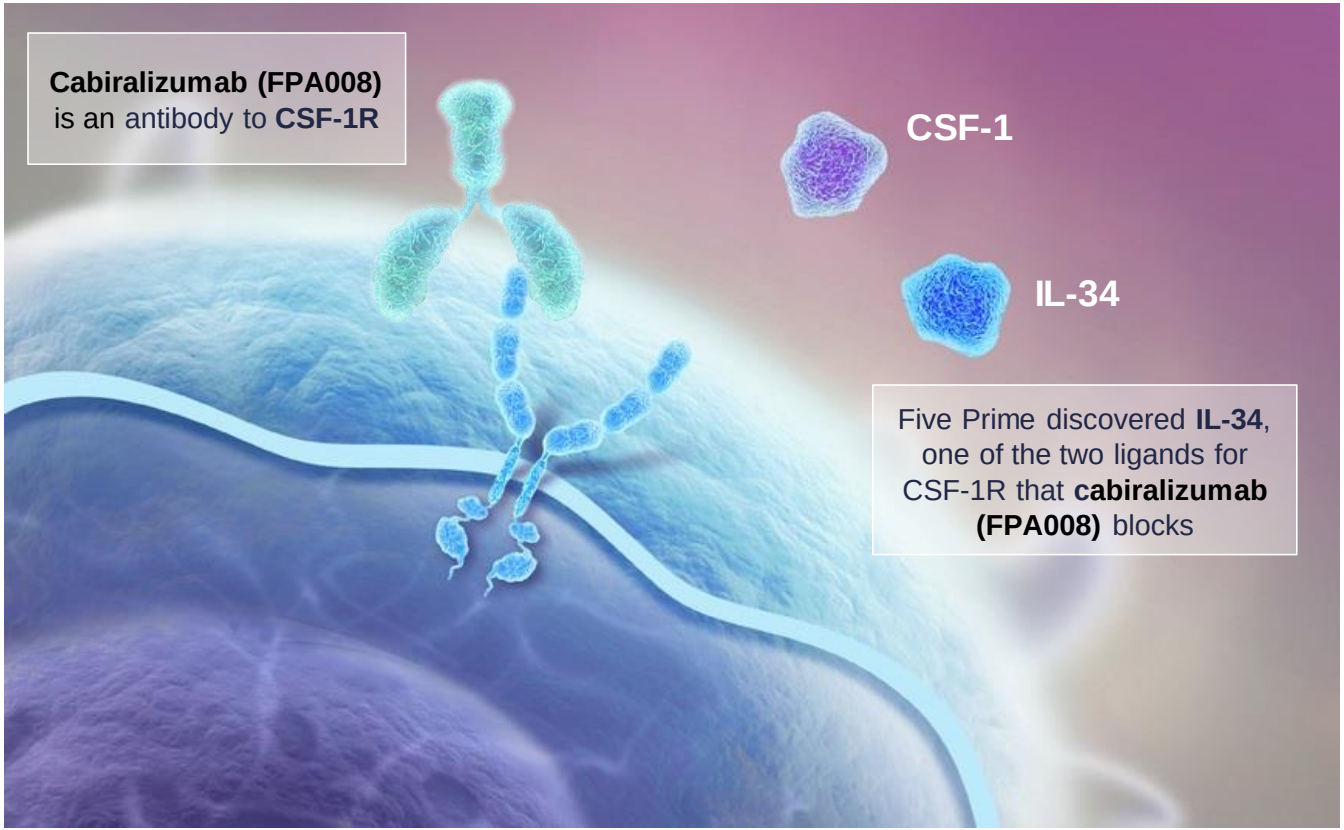
Cabiralizumab, a Product of the Five Prime Platform, Blocks Survival of Macrophages



Exploratory Phase 1 Trial of Cabira + Opdivo in Multiple Tumor Settings

PHASE 1a – Dose escalation and exploratory expansion

- Dose escalation cohorts (monotherapy & combination)
- Expansion in Selected Tumors
- Expansion in Pancreatic (n~30)

PHASE 1b
Cabiralizumab + *Opdivo*

Completed enrollment end of 2017

- Lung (NSCLC)
- Lung (NSCLC) *Anti-PD-1 Resistant*
- Head & Neck
- Pancreatic
- Renal
- Ovarian
- Glioblastoma

N ~280 patients

Study Objectives

- Safety
- Objective response rate and duration
- Survival
- Baseline and on-treatment biopsies

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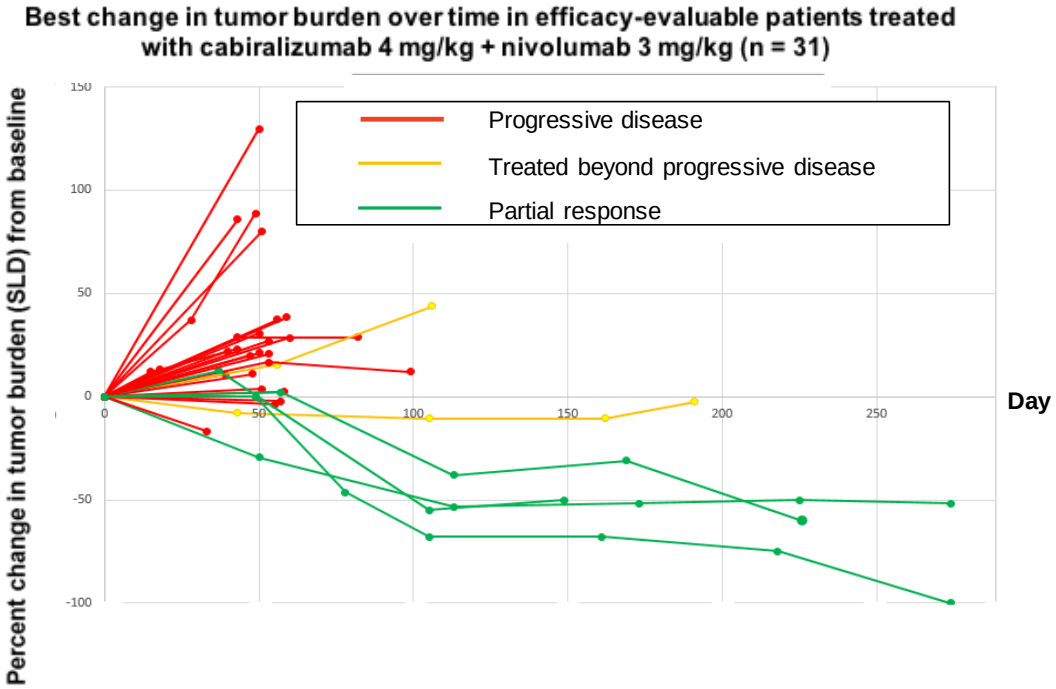
Deep and Durable Responses Observed in Late-Line Pancreatic Cancer*

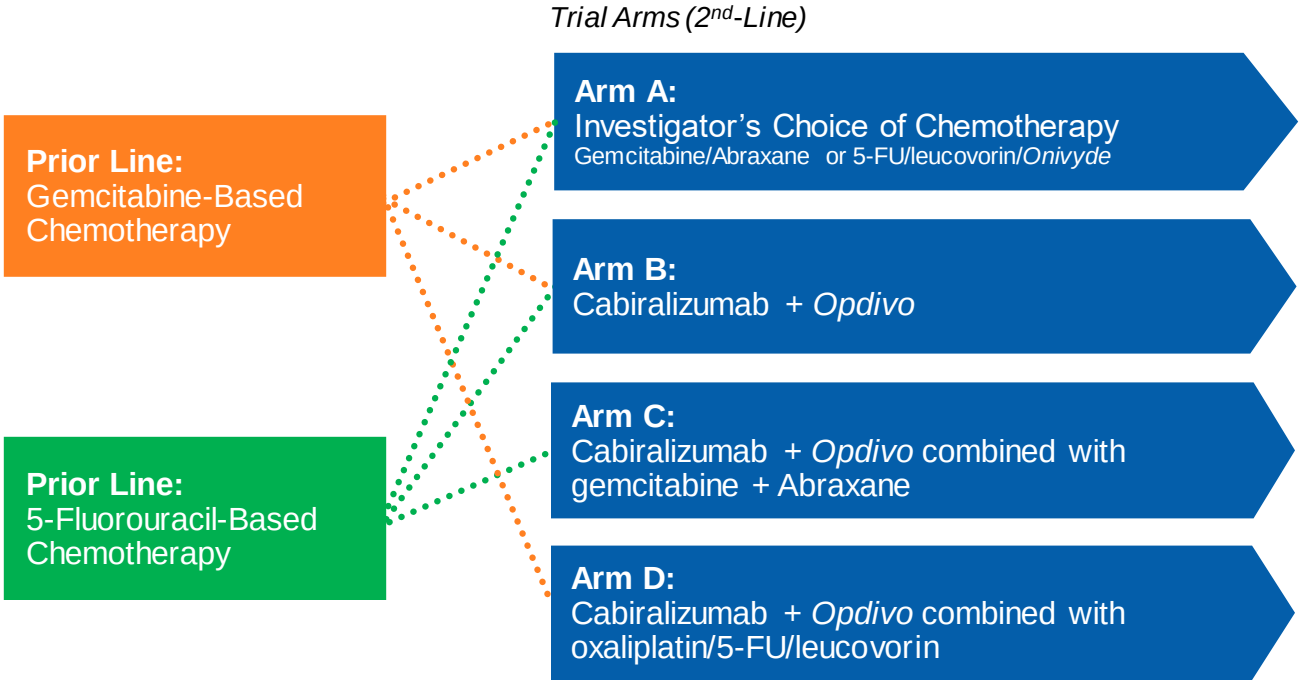


Efficacy:

- Durable clinical benefit observed
  - **Confirmed ORR = 13%**
  - **DCR = 16%**
  - Disease control: **5 to 9+ months**
- Heavily pretreated population (average 3 prior lines of therapy)
- All responders have microsatellite stable (MSS) tumors that do not respond to PD1/L1 therapy
- Responses accompanied by steep declines in levels of the pancreatic tumor marker CA19-9

* SITC, November 2017 Wainberg Z, *et al.*

BMS Advancing Randomized Phase 2 Trial of Cabiralizumab/*Opdivo*® in 2nd-Line Pancreatic Cancer (NCT03336216)



N ~160 patients

Study Objectives

- Progression free survival (primary)
- Objective response rate and duration
- Overall survival rate
- Safety
- PK

- *Dosing of the first patient initiated January 2018*
- *Study will generate data that could support a front-line or second-line pivotal study*

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Phase 2 Trial in PVNS to Inform Possible Pivotal Trial

PHASE 2

Dose expansion

Alternative Dosing Schedule to Improve Tolerability

Completed Enrollment April 2017

Preliminary Data Presented at ASCO June 2017

Go/No Go on Pivotal Trial, 2H 2018

Study Objectives

- Objective response
- Pain
- Functional improvement
- Range of motion
- Tolerability

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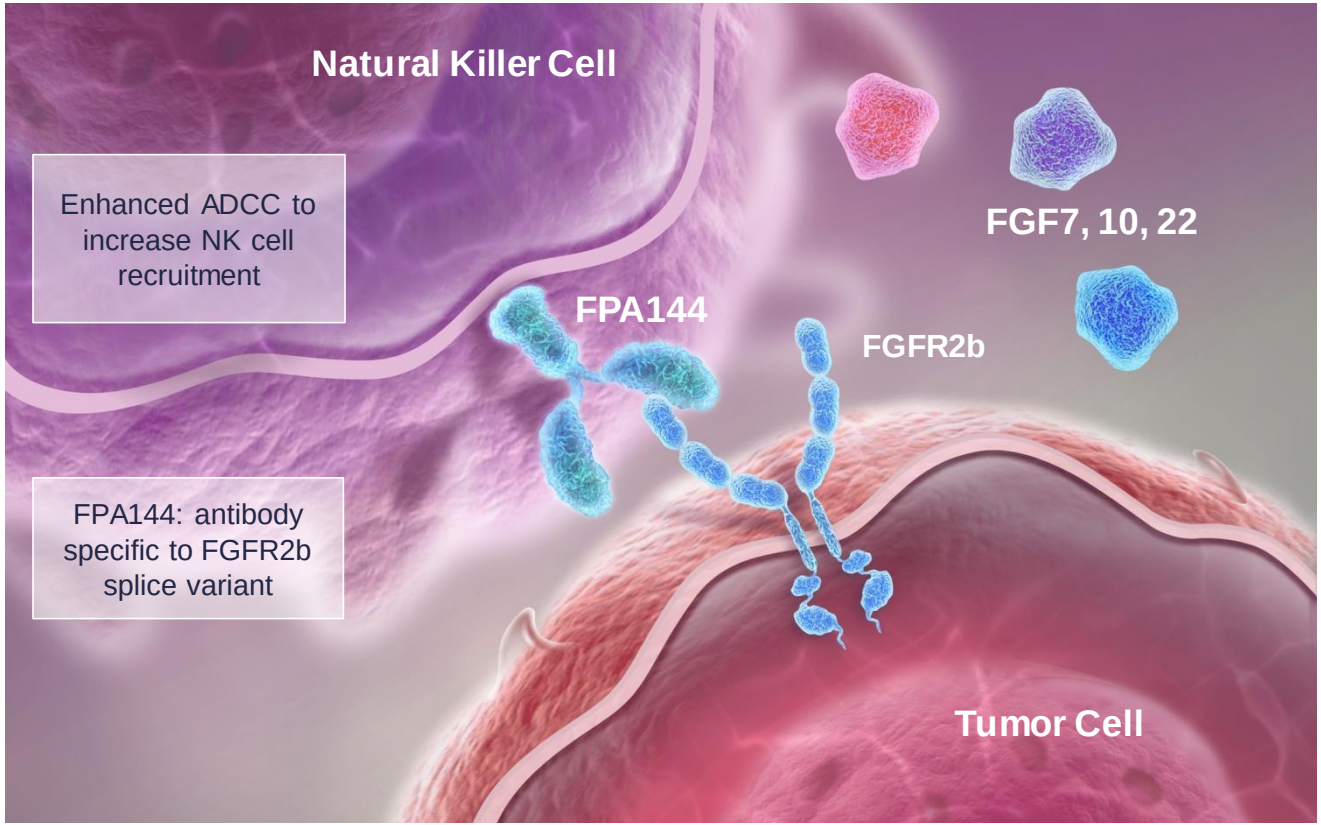
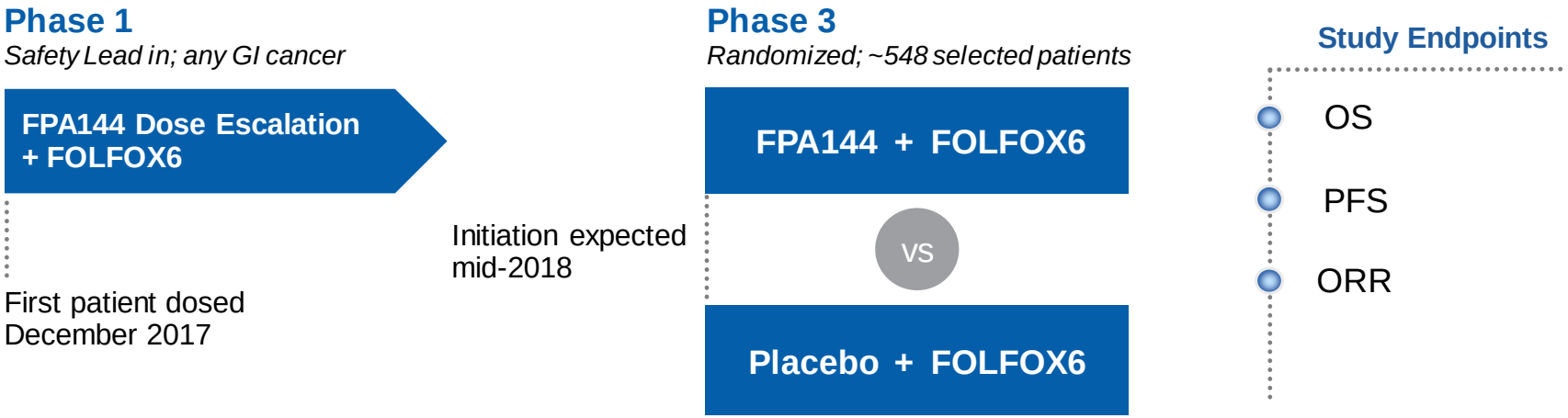
Bemarituzumab (FPA144) Was Designed to Recruit Tumor-Killing NK Cells into the Tumor Microenvironment



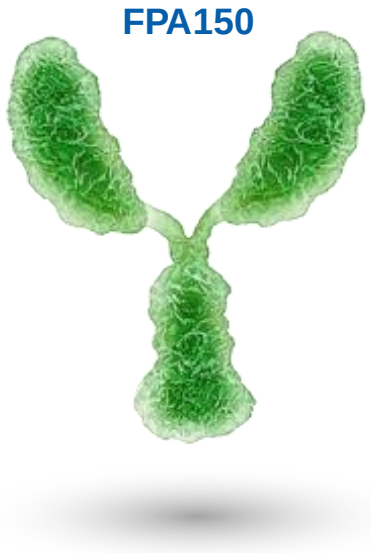
Phase 1/3 FIGHT Pivotal Trial of Bemarituzumab (FPA144) in Front-Line FGFR2b+ Gastric and GEJ Cancer



- FGFR2b overexpression and *FGFR2* gene amplification associated with poor prognosis
- Select biomarker-positive patients by IHC (tumor sample) or ctDNA (blood-based) tests
  - ~10% of patients expected to be biomarker-positive

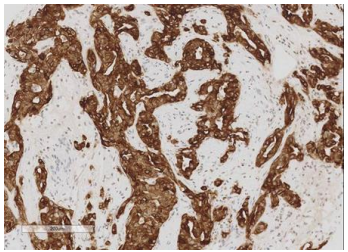
FPA150: First-In-Class B7-H4 Antibody Designed for Two Mechanisms of Action

- Blocks a T cell checkpoint pathway expressed on tumor cells
- Engineered to have enhanced ADCC
- IND filed December 2017; received FDA clearance to proceed with clinical development in January 2018

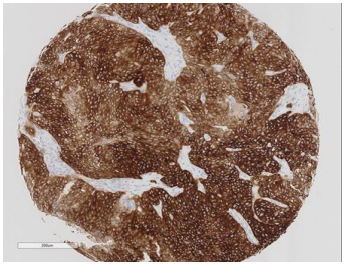


B7-H4 is expressed in multiple solid tumors, including breast and gynecologic cancers

Triple Negative Breast Cancer



Ovarian Cancer



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2017 Preliminary Results (unaudited)

Cash, cash equivalents & marketable securities	$293 million as of December 31, 2017 (unaudited)
Shares outstanding	29 million as of December 31, 2017 (unaudited)
Net proceeds from recent follow-on public offering	$108 million* January 2018

* After deducting underwriting discounts and commissions and estimated offering expenses

Anticipated Five Prime News Flow and Milestones

Cabiralizumab

Bristol-Myers Squibb

Pancreatic Cancer

- BMS initiated randomized Phase 2 trial (2nd-line pancreatic) combo with Opdivo and chemo
- Completed enrollment of additional 30 pancreatic patients with biomarkers in Phase 1

Cabira/*Opdivo* Multiple Tumor Settings

- Completed Phase 1b enrollment YE17; anticipate updates in 2H18

PVNS (Monotherapy)

- Enroll additional patients with flexible q4 week schedule; announce decision on pivotal trial in 2H18

Bemarituzumab (FPA144)

zai lab

Gastric/GEJ Cancer

- Complete Phase 1 portion of FIGHT chemo combo trial
- Initiate randomized, global Phase 3 portion mid-18
- Complete Japan Phase 1 trial in 2018

New Programs

- Initiate FPA150 (B7-H4 antibody) Phase 1 in 1H18
- FPT155 (CD80-Fc) IND in 2H18
- Anti-TIM-3 Phase 1 initiation — Bristol-Myers Squibb

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Thank you

www.fiveprime.com

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