FivePrime®

FY17 Earnings Update

February 27, 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 certain patient populations; (iv) the prevalence and incidence of certain diseases; (v) the timing of the filing of INDs; (vi) Five Prime's full-year 2018 net cash used in operating activities; and (vii) the amount of Five Prime's cash, cash equivalents and marketable securities at the end of 2018.

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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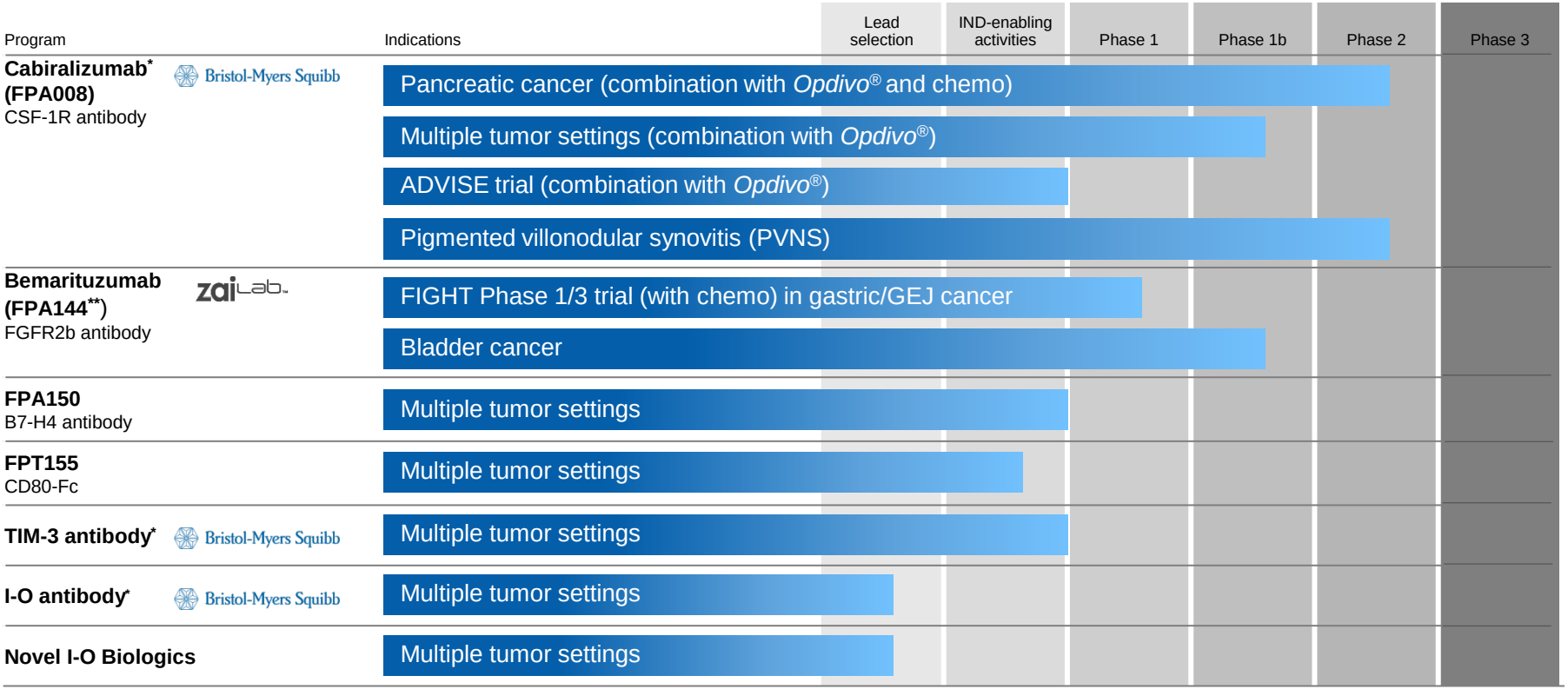
Five Prime in 2018 – Value Proposition

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

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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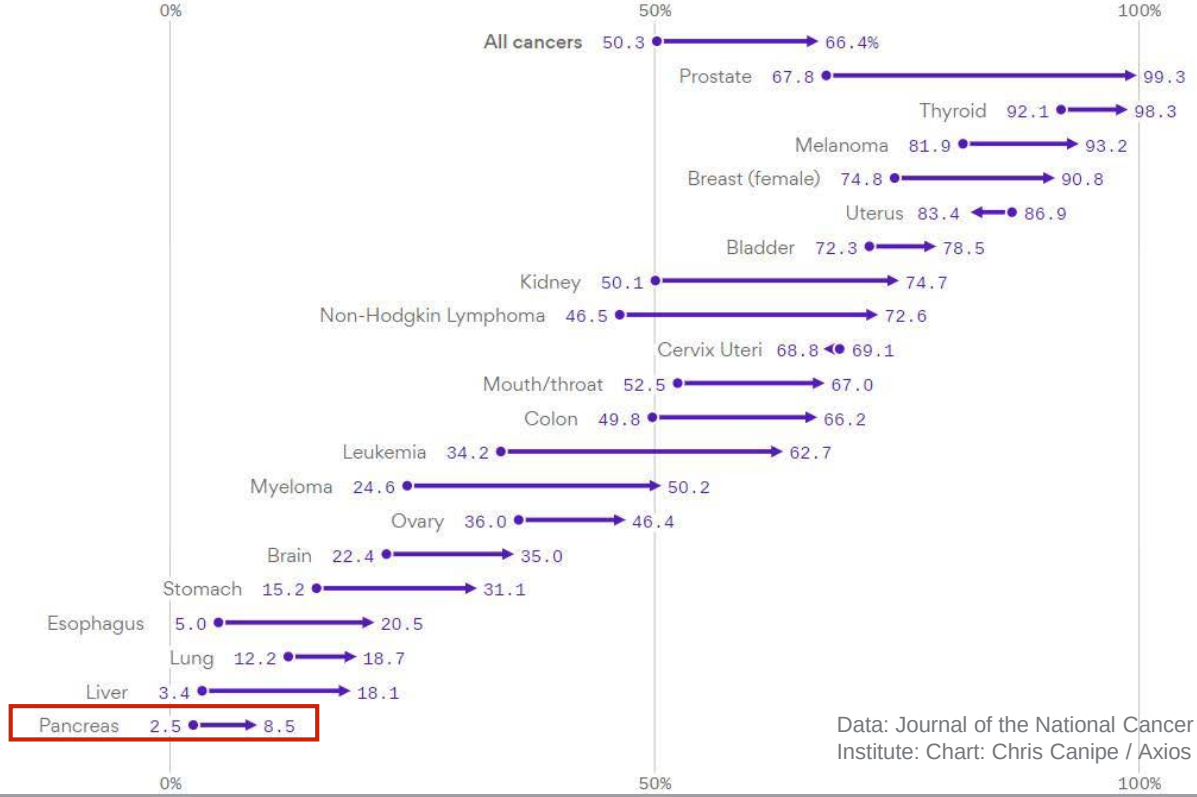
Five Prime FY17 Highlights

- **Cabiralizumab I-O**
  - With BMS, reported initial data from the Phase 1a/1b trial of cabira and Opdivo in advanced solid tumors.
    - In patients with advanced microsatellite stable (MSS) pancreatic cancer: durable clinical benefit in 16%, 13% ORR, median 4th-line.
    - As comparison, Onivyde, the most recent FDA-approved drug for pancreatic cancer, had ORR of 7.7% in 2nd-line or later.
  - Completed enrollment in all of the Phase 1b I-O cohorts by EOY17.
  - Added 35 patients with pancreatic cancer to the original trial after announcing the encouraging data.
  - BMS initiated a randomized Phase 2 trial evaluating the combination as a second-line treatment in ~160 patients with locally advanced or metastatic pancreatic cancer.
- **Cabiralizumab PVNS**
  - Ongoing Phase 2 trial of cabira in PVNS to optimize dosing schedule.
  - Estimated prevalence of 67,500 patients in the US, EU5 and Japan.
- **Bemarituzumab (FPA144)**
  - Initiated safety lead-in to FIGHT trial, a Phase 1/3 registrational study of bema with chemotherapy in front-line gastric cancer.
  - Entered into strategic development collaboration and exclusive license agreement in Greater China with Zai Lab.
  - Filed a clinical trial application (CTA) in China in December 2017.
- **Early Research Programs**
  - BMS filed an IND for a TIM-3 antibody and extended the research collaboration term to March 2019.
  - GSK exercised its right to license a drug target in the respiratory disease collaboration between the companies; second respiratory target licensed under this collaboration.

Pancreatic Cancer has Lowest 5-year Survival Rate Among 20 Common Cancers with Little Improvement Over Past ~35 Years

Five-year survival rates for most common cancer sites

Average for the years 1975-77 and 2006-12



Data: Journal of the National Cancer Institute: Chart: Chris Canipe / Axios

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PVNS is an Attractive Market

- Surgery is the most common treatment option and tumors often progress in patients with diffuse PVNS (D-PVNS)
- Estimated 2017 incidence and prevalence of D-PVNS based on Five Prime-sponsored Danish registry study[1]:

Adult D-PVNS	US	EU5*	Japan
Incidence	2,000	2,000	800
Prevalence	28,200	28,100	11,200

- Market research in the US indicates that up to 65% of prevalent D-PVNS patients would be eligible for treatment with an anti-CSF1-R drug[2]

1 Ehrenstein, et al. J Rheumatol, August 2017.
2 FPRX Market Research of ~50 patients and physicians
*EU5= France, Germany, Italy, Spain, UK

Sizeable Market Opportunity for Bemarituzumab (FPA144) in the Front-Line Treatment of FGFR2b+ Gastric and GEJ Cancer

- Median PFS of FOLFOX alone in front-line gastric cancer treatment: 6 - 7 months[2]
- Unmet need: FGFR2b+ patients have significantly reduced survival

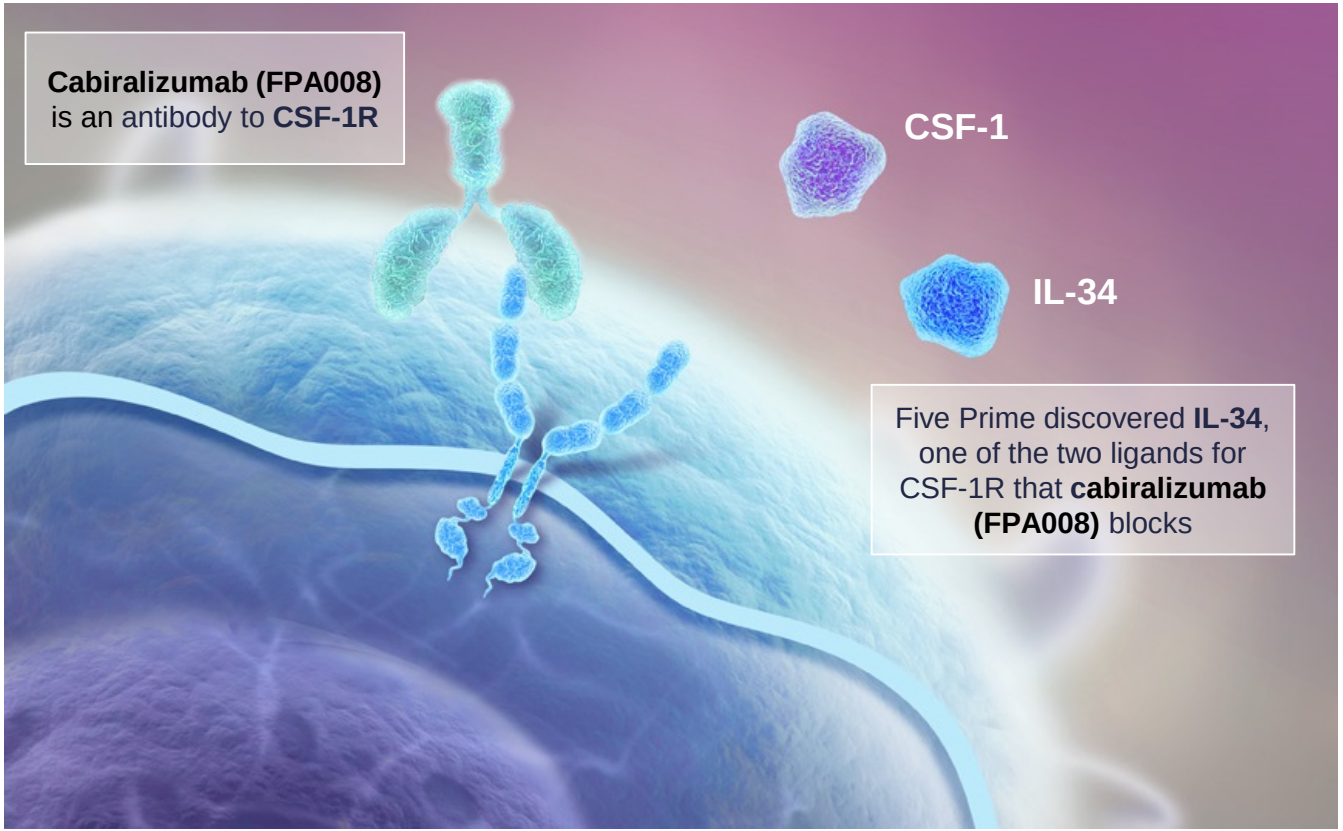
Estimated Incidence of Addressable Metastatic Gastric and GE Junction Adenocarcinoma Patients

	US[1]	EU5*[1]	Japan[1]	China (urban)
1st line patients	16,630	38,700	72,800	163,800
Treatment eligible (10% FGFR2b+)	1,663	3,870	7,280	16,380

*EU5 = France, Germany, Italy, Spain, UK

1. Decision Resources Group, *Market Forecast Assumptions – Gastric Cancer*, October 2016
2. ASCO 2014

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=35)

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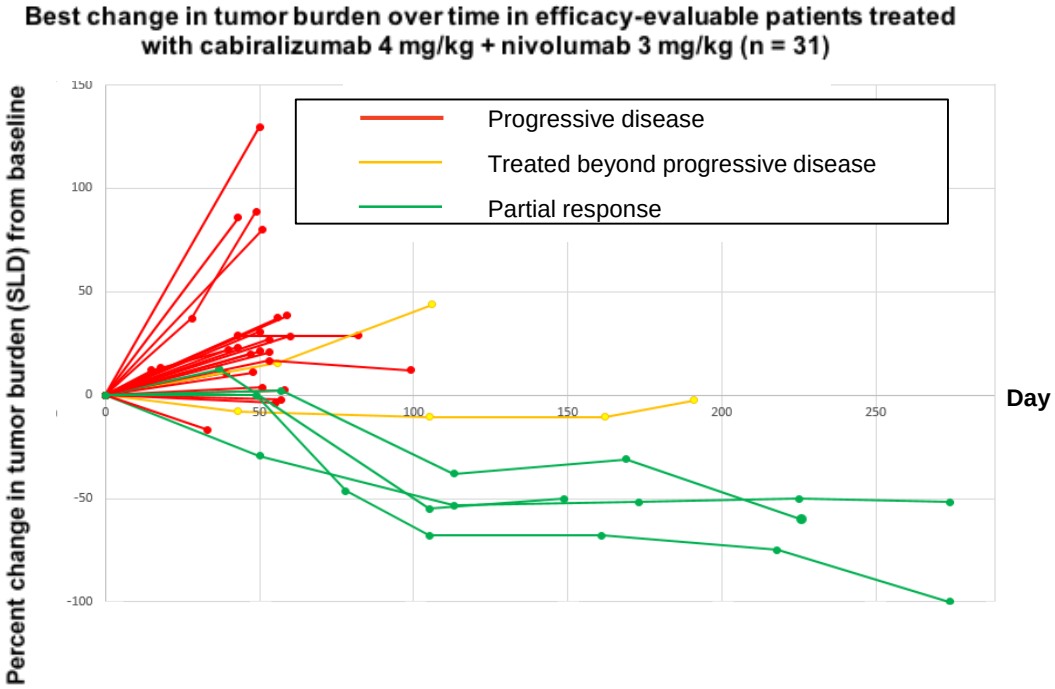
Deep and Durable Responses Observed in Late-Line Pancreatic Cancer*

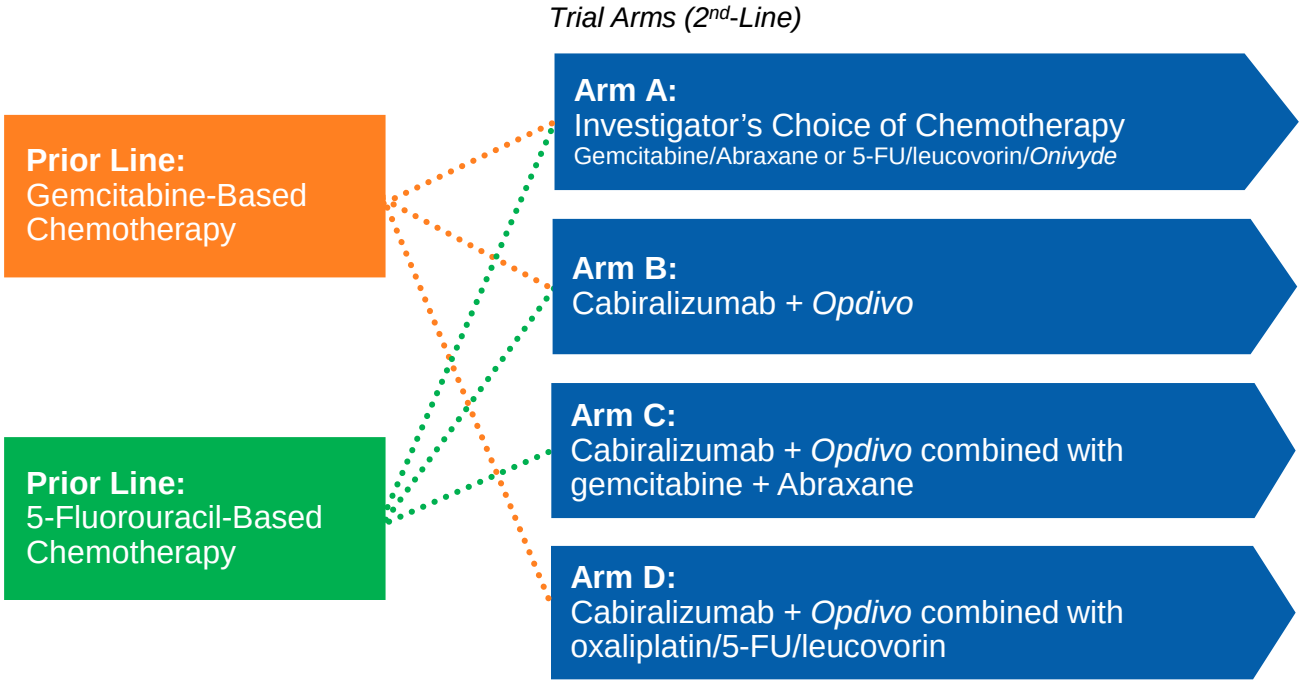


Efficacy:

- 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*

Phase 2 Trial in PVNS to Inform Possible Pivotal Trial

PHASE 2

Dose expansion

Alternative Dosing Schedule to Improve Tolerability

Completed Enrollment April 2017

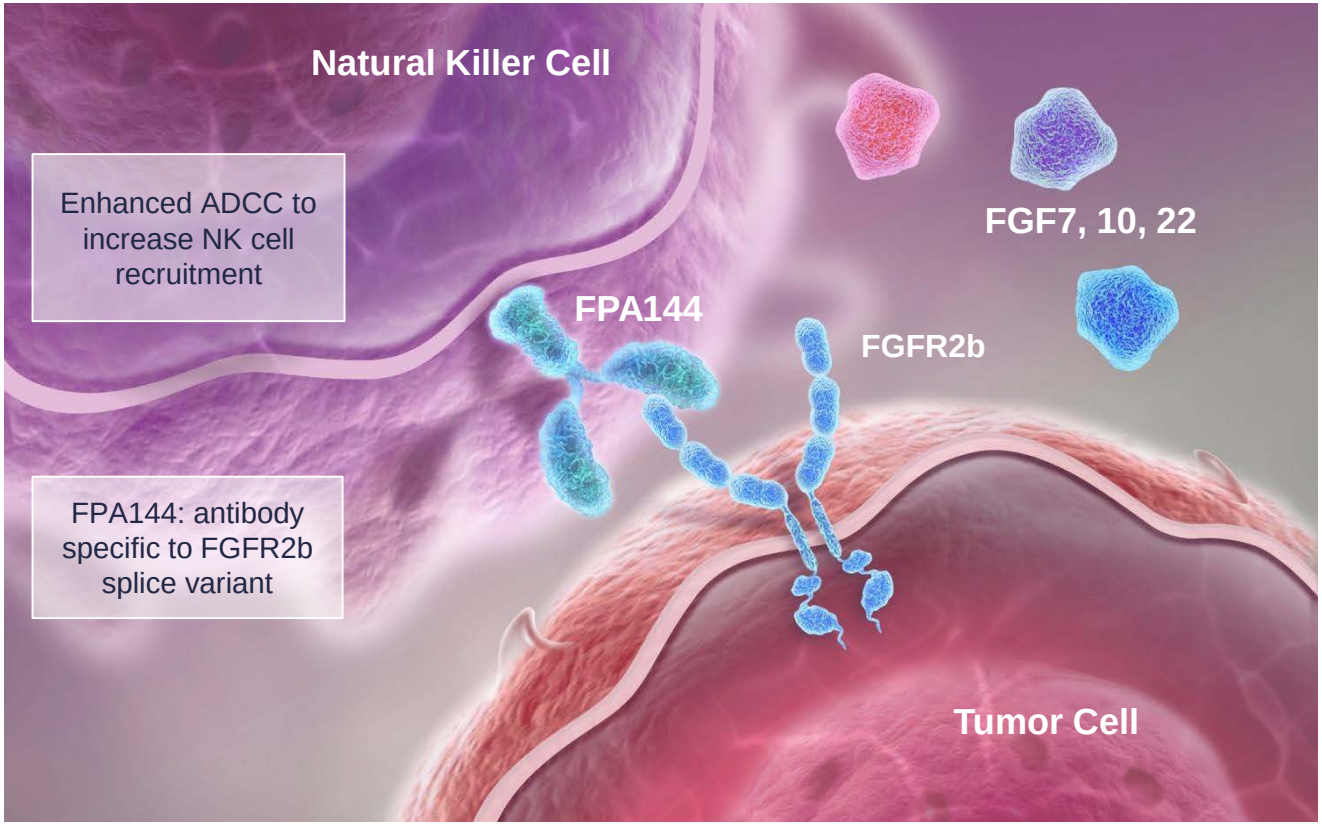
Preliminary Data Presented at ASCO June 2017

Go/No Go on Pivotal Trial, 2H 2018

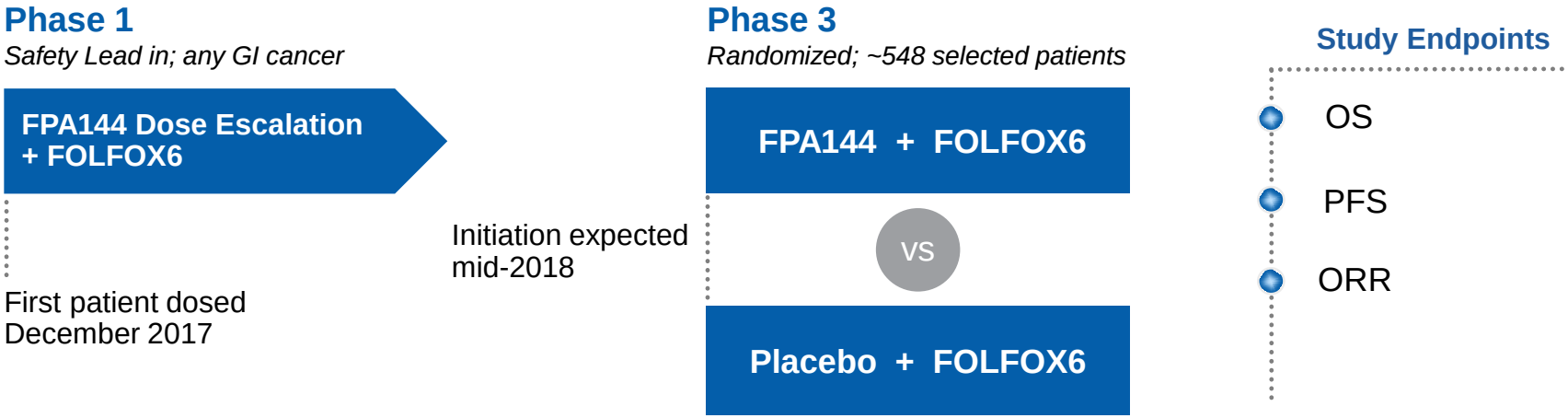
Study Objectives

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

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



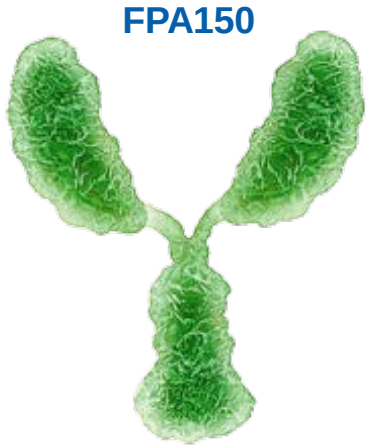
Phase 1/3 FIGHT Pivotal Trial of Bemarituzumab (FPA144) in Front-Line FGFR2b+ Gastric and GEJ Cancer



- 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

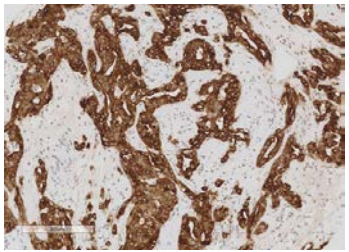
FPA150: First-In-Class B7-H4 Antibody Designed for Two Mechanisms of Action

- Blocks a T cell checkpoint pathway expressed on tumor cells
- Engineered to have enhanced ADCC
- IND filed December 2017; plan to start Phase 1 in H1 2018

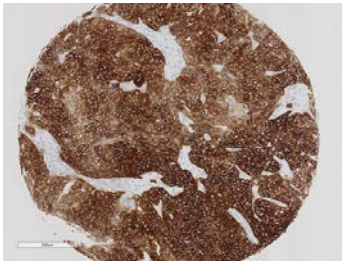


B7-H4 is expressed in multiple solid tumors, including breast and gynecologic cancers

Triple Negative Breast Cancer



Ovarian Cancer



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FPA150 Phase 1 Clinical Trial Testing Monotherapy Against Selected B7-H4 Expressing Tumors

PHASE 1a
Dose escalation

Any solid tumor

Initiation expected in the first half of 2018

PHASE 1b
Expansion; ~30 patients/cohort

- **Breast Cancer**
- **Ovarian Cancer**
- **Endometrial Cancer**
- **Urothelial (Bladder) Cancer**
- **Additional cohorts TBD based on emerging data**

Study Objectives

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

- IHC assay to be used to select B7-H4 expressing tumors in Phase 1b
- Evaluating several I-O and chemo combination strategies to implement depending on Phase 1b monotherapy data

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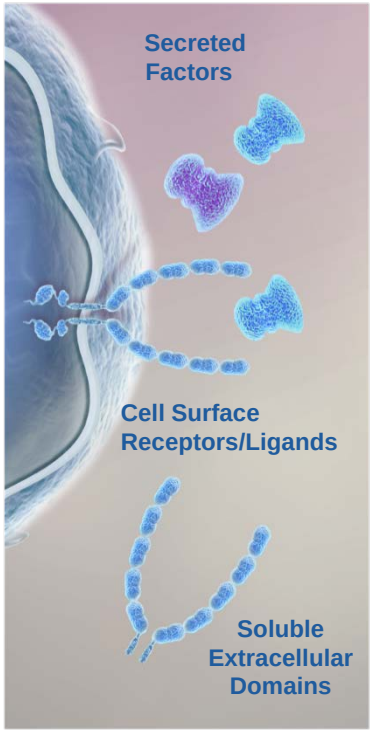
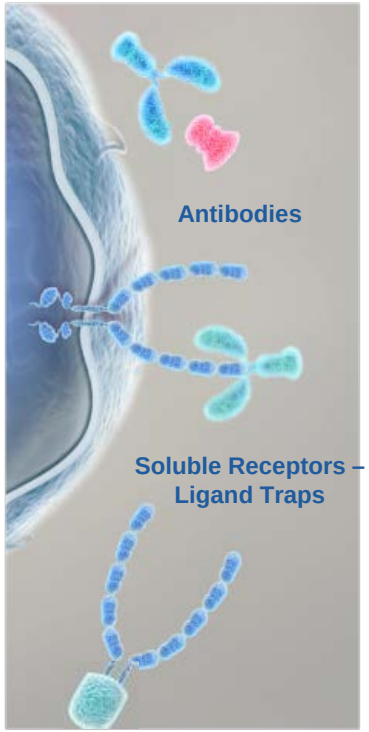
IND Engine: Unique Platform Generating Novel Therapeutics

Comprehensive Libraries of Extracellular Proteins

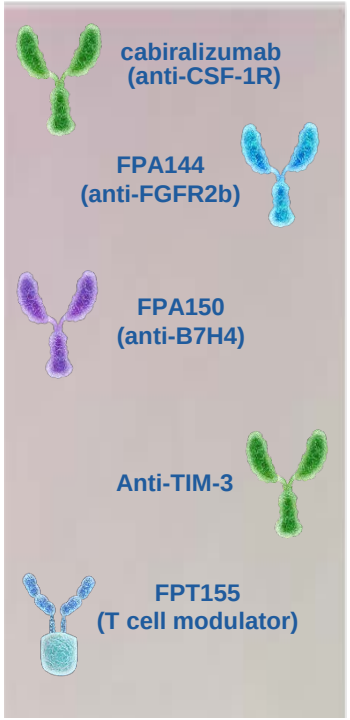


Proprietary Screens

Protein Therapeutics



Advanced Into Clinical Development



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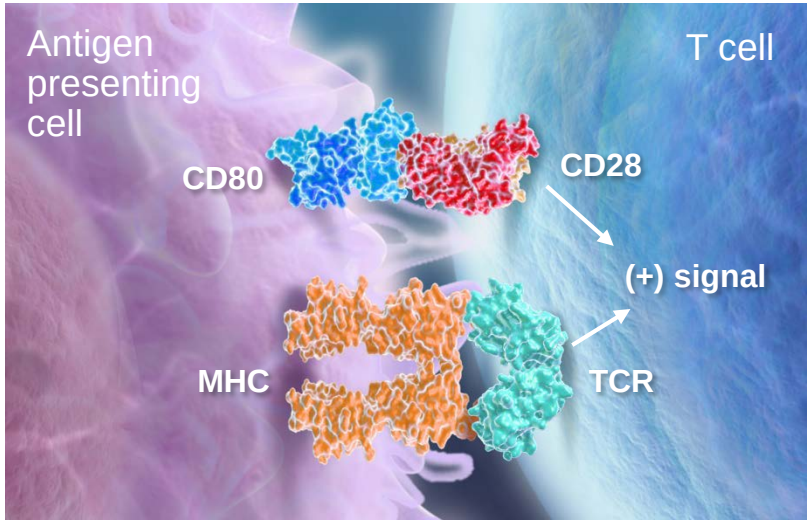
FPT155: First-In-Class CD80-Fc Fusion Protein Engineered to Activate T cells Through Multiple Pathways

Normal T cell activation via CD80

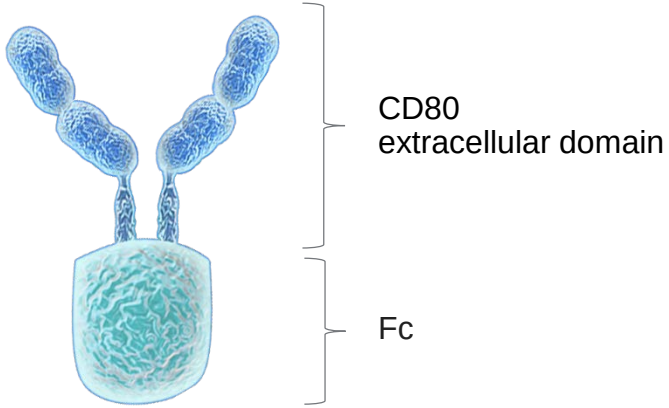


CD80 is a co-stimulatory molecule expressed on antigen presenting cells

IND planned 2H18

FPT155 uses the binding interactions of soluble CD80 to:

- Block CTLA-4 from competing for endogenous CD80, allowing CD28 signaling to prevail in T cell activation
- Directly engage CD28 to further enhance its co-stimulatory activity *(without super agonism)*



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Cash and Shares Outstanding

Cash, cash equivalents & marketable securities, EOY 2017	$293 million
Shares outstanding	29 million as of December 31, 2017
Net proceeds from recent follow-on public offering	$108 million* January 2018
Estimated cash, cash equivalents & marketable securities, EOY 2018	~ $250 million
FY 2018 estimated net cash used in operating activities	< $135 million

* After deducting underwriting discounts and commissions and estimated offering expenses

Summary of Financial Results

(as of December 31, 2017; In Millions Except Per Share Amounts)

	4Q17	4Q16	FY17	FY16
Revenue	$13.2	$8.3	$39.5	$30.7
R&D expense	$32.7	$29.1	$150.9	$94.1
G&A expense	$10.5	$10.5	$40.0	$35.8
Net loss	($29.2)	($20.1)	($150.2)	($65.7)
LPS per basic and diluted share	($1.04)	$(0.73)	($5.38)	($2.44)

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Anticipated Five Prime News Flow and Milestones

Cabiralizumab

Bristol-Myers Squibb

Pancreatic Cancer

- BMS enrolling randomized Phase 2 trial (2nd-line pancreatic) combo with Opdivo and chemo
- Treating additional 35 late-line pancreatic patients with cabira+Opdivo and complete biomarker analysis

Cabira/*Opdivo* in Other Tumor Settings

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

PVNS (Monotherapy)

- Enroll additional patients with flexible q4 week schedule; decide on pivotal trial by EOY18

Bemarituzumab (FPA144)

zai lab

Gastric/GEJ Cancer

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

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