Five Prime Therapeutics, Inc.
Corporate Overview

June 2015

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 FivePrime'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 timing of receipt of clinical results for our product candidates; (iii) the potential use of our product candidates to treat patients; (iv) the extent of gene amplification and protein overexpression in certain patient populations; (v) the advancement of our immuno-oncology program; and (vi) the period during which we expect to be able to fund operations.

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 FivePrime's filings with the U.S. Securities and Exchange Commission, including the "Risk Factors" sections contained therein. 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.
Investment Highlights

• 3 clinical-stage protein therapeutics covering 11 indications
• Competitive advantage in immuno-oncology
  • Unique discovery platform for novel targets and protein drugs
  • Clinical and research collaborations with BMS
• Platform generates assets valued by pharma; strong track record of deal-making
Platform: A Library of Substantially All Extracellular Proteins to Identify New Targets and Therapeutics

Library of > 5700 Extracellular Proteins

- Secreted Factors
- Cell Surface Receptors
- Soluble Receptors (Ligand Traps)

Proprietary Screens

- Cell-based Screens
- In Vivo Screens

Protein Therapeutics

- Antibodies to Novel Targets (Secreted Proteins Or Receptors)
- Soluble Receptors (Ligand Traps)
Many New IO Targets Remain to be Discovered in the Tumor Microenvironment

The Five Prime Immunome: ~500 Cell Surface Receptors Enriched for Regulators of the Immune Response to the Tumor

T Cell

Macrophage

Tumor Cell

FPxx

FPyy

PD-1

PDL-1

The Five Prime Advantage: Functionally Screening the Entire Immunome

Cell-based Screens

In Vivo Screens

Receptor-Ligand Matching
Our Current Focus: T Cells and TAMs

T Cell Checkpoints

- Identified multiple novel drug targets
  - Two pathways partnered with BMS
  - All other targets unpartnered
- Antibody work underway with Adimab, Vaccinex, and BMS

Tumor-Associated Macrophages

- FPA008 CSF1R antibody blocks TAMs
  - Based on our discovery of IL-34
  - Phase 1a/1b with Opdivo® in H2:2015

- Future Expansion: Tregs, MDSC, and dendritic cells
- Goal: 1 IND per year beginning 2017
Clinical Pipeline: 3 Protein Therapeutics Covering 11 Indications

<table>
<thead>
<tr>
<th>INDICATIONS</th>
<th>PRE-IND</th>
<th>PHASE 1</th>
<th>PHASE 1B</th>
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<tbody>
<tr>
<td>FPA008 CSF1R antibody</td>
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<td>6 cancers in combination with <em>Opdivo</em>® (nivolumab)</td>
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<td>PVNS</td>
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<td>Rheumatoid Arthritis</td>
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<td>FPA144 FGFR2b antibody</td>
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<td>Gastric Cancer</td>
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<td>Partnered</td>
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<td>FP-1039 (GSK 3052230) FGF ligand trap</td>
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<td>Squamous NSCLC</td>
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<td>Mesothelioma</td>
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FPA008
Antibody for Macrophage-Dependent Diseases
FPA008 Blocks Activation and Survival of Macrophages by Blocking Ligand Binding to CSF-1R

Macrophages/Monocytes/Osteoclasts

CSF-1R

FPA008

CSF-1

IL-34 (Discovered by FivePrime)

Survival Activation
CSF-1R Dependent Cells Play Pivotal Roles in Cancer, PVNS and Autoimmunity

Monocytes

- Tumor-Associated Macrophages
  - Cancer (Immunoo-Oncology)

- Macrophages in Joints
  - Pigmented Villonodular Synovitis (PVNS)

- Inflammatory Macrophages, Osteoclasts
  - Rheumatoid Arthritis
Tumor-associated macrophages (TAMs)

- are immunosuppressive
- correlate with poor prognosis
- are associated with resistance to IO therapy
- Depend on CSF-1R for survival

F4/80 Staining for Macrophages in the MC38 Tumor Model
Strong Rationale for Combining Blockers of CSF-1R and PD-1

TAMs and PD-1 Activation Suppress Tumor Killing

TAM Reduction and PD-1 Inhibition Enhance Tumor Killing

CD8 T Cell

PD-1

Tumor cell

CD8 T Cell

PD-1

Tumor cell

TAM

CSF-1R

TAM

CSF-1R

FPA008

nivolumab

PD-L1

Tumor killing

PD-L1
CSF-1R Inhibition Synergizes with Checkpoint Inhibitors

Pancreatic tumor model

Tumor regression

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FPA008 Activity Synergizes with Immune Agonists

MC38 Colon Cancer Xenograft

Potential for Future Combinations with Other IO Modalities

* p<0.0001
FPA008 Phase 1 Advancing

• Completed testing in healthy volunteers
  • No dose-limiting toxicities
  • All adverse events were grade 1 or 2 and reversible
  • Well tolerated up to 3 mg/kg
  • PK profile supports biweekly or less frequent dosing

• Advanced into open-label dosing in Rheumatoid Arthritis patients
  • Data will be presented before end of 2015
FPA008 Caused Rapid and Sustained Reduction of Monocyte Biomarkers in Healthy Volunteers

- FPA008 selectively reduced CD16-positive monocytes -- cells associated with inflammation and cancer
- FPA008 also reduced bone turnover markers (osteoclast effect)

CD16-positive Monocytes After a Single Dose

![Graph showing CD16-positive monocytes per µL blood over weeks for different doses of FPA008 and placebo.](image-url)
FPA008 & Nivolumab Combination Trial in Six Cancers Expected to Begin Mid-2015

- Five Prime plans to conduct a Phase 1a/1b clinical trial
  - 1a: Dose escalation to assess safety and tolerability of the combination
  - 1b: Expand into six tumor settings to assess preliminary efficacy

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<tr>
<th>Demonstrated nivolumab activity</th>
<th>Exploratory</th>
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<tr>
<td>Non-small cell lung cancer*</td>
<td>Pancreatic cancer</td>
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<tr>
<td>Melanoma*</td>
<td>Colorectal cancer</td>
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<tr>
<td>Head &amp; neck</td>
<td>Malignant glioma</td>
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*Approved indications for Opdivo® (nivolumab)

- Five Prime retains full ownership of FPA008
PVNS is a CSF-1-Driven Orphan Disease

• Rare, locally aggressive tumor of synovium
  • Over-expression of CSF-1 recruits macrophages forming the tumor mass
  • High morbidity

• No approved therapies

• Phase 1/2 PVNS trial planned for mid-2015
  • IND cleared April 2015
  • Phase 1: Select optimal dose for Phase 2
  • Phase 2: Assess tumor shrinkage, pain and joint function
FPA144
Antibody for Gastric Cancer
FPA144: An Antibody to FGF Receptor 2b with Enhanced Cell Killing (ADCC) for Treating Gastric Cancer

- Recruits natural killer (NK) cells more effectively than native antibody
- Incorporates BioWa’s POTELLIGENT® glycoengineering technology
Rationale for Targeting FGFR2b in Gastric Cancer

- **FGFR2** gene amplification occurs in ~5% of gastric cancer patients
  - Additional patients may have tumors with FGFR2b protein overexpression without gene amplification
  - Worldwide prevalence of gastric cancer: 1.5 million patients
- High unmet need: **FGFR2** gene amplification or FGFR2b protein overexpression is associated with lower overall survival
- FPA144 is effective in preclinical models
FPA144 Phase 1 Study Now Enrolling Patients

- Expect to begin dosing selected gastric cancer patients by EOY 2015
- If clinical activity seen in Phase 1, potential for accelerated development (U.S. orphan drug) as monotherapy
- Potential future combination trial with front-line chemotherapy
FP-1039
Ligand Trap for Cancer
FP-1039 Selectively Blocks FGFR1 Ligands

- Selectively blocks cancer-promoting FGFs that bind to FGFR1, not unrelated FGFs
- FGFR1 amplification in sqNSCLC is associated with diminished survival
- Safe and well-tolerated as monotherapy in Phase 1; target engagement demonstrated
- Avoids retinal detachment, hyperphosphatemia, mucositis, nailbed changes and asthenia seen with small molecule TKIs
GSK-Funded Phase 1b Clinical Trial of FP-1039/GSK3052230 (Study FGF117360)

Global study enrolling 70 to 120 patients

- **Squamous NSCLC**
  - 1st-line, paclitaxel/carboplatin
  - Previously treated, docetaxel

- **FGFR1 amplification (10-20%)**

- **FGF2 ligand over-expression**

- **Mesothelioma**
  - 1st-line, cisplatin/pemetrexed

- **Safety and Tolerability in combination with SOC**

- **Dose/PK**

- **Overall Response Rate & Duration**

GSK plans to report preliminary data by EOY 2015
Financial Highlights

• Expect cash runway to extend into 1H2018
  • Past efficacy data readouts for all three clinical programs
  • Move one or more new immuno-oncology candidates into clinical trials

• $217 million cash as of March 31, 2015

• Guidance
  • Expect 2015 net cash used in operating activities to be between $59 and $63 million
  • Estimate ending 2015 with between $165 and $170 million in cash
## Expectations

<table>
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<th>INDICATION</th>
<th>EXPECTATIONS</th>
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<tbody>
<tr>
<td>FPA008 CSF1R antibody</td>
<td>6 Cancers</td>
<td>Complete Phase 1a dose escalation &amp; expand to Phase 1b by late 2015/early 2016</td>
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<td>PVNS</td>
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<td>RA</td>
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<td>Immuno-Oncology Research</td>
<td>Cancer</td>
<td>Advance internal drug candidates to preclinical development</td>
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