Targeting the Pathways Critical to Cancer Stem Cells

Paul J. Hastings
Chairman & CEO
June 2014
Safe Harbor Statement

These slides and accompanying oral presentation contain forward-looking statements. All statements, other than statements of historical fact, included in these slides and accompanying oral presentation are forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as “may,” “could,” “will,” “would,” “should,” “expect,” “plan,” “anticipate,” “believe,” “estimate,” “intend,” “predict,” “seek,” “contemplate,” “potential” or “continue” or the negative of these terms or other comparable terminology. Forward-looking statements in these slides and accompanying oral presentation include, but are not limited to, statements about: the initiation, timing, progress and results of our preclinical studies and clinical trials, and our research and development programs; our ability to advance product candidates into, and successfully complete, clinical trials; the tolerability of our product candidates at efficacious doses; our collaborators’ exercise of their license options; the commercialization of our product candidates; the implementation of our business model, strategic plans for our business, product candidates and technology; the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates and technology; estimates of our expenses, future revenues, capital requirements and our needs for additional financing; the timing or likelihood of regulatory filings and approvals; our ability to maintain and establish collaborations or obtain additional government grant funding; our financial performance; and developments relating to our competitors and our industry.

These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. Such risks and uncertainties include, among others, the uncertainties inherent in the preclinical and clinical development process; the risks and uncertainties of the regulatory approval process; our dependence on our collaboration partners, including Celgene, GSK and Bayer, for the funding of our partnered programs; our ability to raise additional capital to support the development of our unpartnered programs; our dependence on the development and marketing efforts of our partners for the commercial success of our partnered product candidates; our reliance on third parties to conduct certain preclinical studies and all of our clinical trials; our reliance on single source third-party contract manufacturing organizations to manufacture and supply our product candidates; our ability to validate, develop and obtain regulatory approval for companion diagnostics; our ability to achieve market acceptance and commercial success of our product candidates once regulatory approval is achieved; our ability to discover, develop and commercialize additional product candidates; the ability of competitors to discover, develop or commercialize competing products more quickly or more successfully; our dependence on our Chairman and Chief Executive Officer, our Chief Scientific Officer, our Chief Medical Officer and other key executives; risk of third party claims alleging infringement of patents and proprietary rights or seeking to invalidate our patents or proprietary rights; and the ability of our proprietary rights to protect our technologies and product candidates. Other factors that may cause actual results to differ materially from current expectations include, among other things, those listed under “Risk Factors” or otherwise described in our Annual Report on Form 10-K for the fiscal year ended December 31, 2013, filed with the Securities and Exchange Commission (SEC) on March 18, 2014 and our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2014, filed with the SEC on May 8, 2014.

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OncoMed Pharmaceuticals, Inc.
A Leading Cancer Stem Cell (CSC) Company

Proprietary Discovery Capabilities
- Targeting critical oncology pathways
- Pipeline of potential first-in-class oncology therapeutics
- All discovered at OncoMed; robust IP portfolio

Deep Clinical Pipeline
- Five clinical programs advancing to Phase 2 (>375 pts)
- Early evidence of clinical activity
- Data from multiple randomized Phase 2 trials by 2015-16

Strong Long-Term Outlook
- Partnerships with Celgene, Bayer and GSK
- Multiple billions in future milestones
- Ongoing discovery research
Why Cancer Stem Cells?

Cancer Stem Cells (CSCs) drive tumor growth, recurrence and metastasis; are not effectively targeted by current therapies.

Therapeutic objectives
- Block CSC self-renewal
- Force tumor differentiation

Human colon cancer with CSCs

OncoMed drug candidate

Differentiation

CSC
OncoMed Area of Focus

Stem Cell Pathways Dysregulated in Cancer

Notch Pathway  Wnt Pathway  RSPO/LGR Pathway  New Pathways

Kinases
- Her2*
- EGFR
- Met
- VEGFR*

Cytotoxics
- Taxanes*
- Alkylating agents*
- Anti-metabolites*
- Topoisomerase inh.*

Reduce CSC Frequency

*Do Not Reduce CSC Frequency
<table>
<thead>
<tr>
<th>Therapeutic</th>
<th>Preclinical</th>
<th>IND</th>
<th>Phase I</th>
<th>Phase Ib</th>
<th>Phase Ib/II</th>
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<td>Demcizumab</td>
<td>Anti-DLL4; OMP-21M18: NOTCH</td>
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<td>Tarextumab</td>
<td>Anti-Notch2/3; OMP-59R5: NOTCH</td>
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<td>Vantictumab</td>
<td>anti-Fzd7, OMP-18R5: WNT</td>
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<td>Fzd8-Fc</td>
<td>OMP-54F28: WNT</td>
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<td>Anti-Notch1</td>
<td>OMP-52M51: NOTCH</td>
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<td>Anti-DLL4/anti-VEGF</td>
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<td>Anti-RSPO3</td>
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<td>Small Molecules</td>
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<td>Small Molecules (Undisclosed)</td>
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<td>Other Pathways</td>
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<td><strong>PRECLINICAL</strong></td>
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</table>
| Multi-Product, Multi-Pathway Partnership Partnership  
Option to Co-Develop and Co-Commercialize  

Transformative Agreement for up to 6 Biologics  

- $155M upfront  
- $22.25M equity investment  
- Up to 6 biologics + 1 Celgene-led small molecule program  
- Option to co-develop 5 biologics worldwide  
  - Development cost-sharing: 1/3: OMED; 2/3: CELG  
- Option to co-commercialize in U.S.  
  - 50-50 profit-sharing  

|  
| Opt-ins: Ph2 for DEM, Ph1 for others  
| Option fees and milestones up to:  
  - ~$790M: demcizumab  
  - ~$505M: Anti-DLL4/VEGF bispecific  
  - ~$440M each: up to 4 candidates from RSPO or undisclosed pathways  
  - ~$100M+ small molecule  
| Ex-U.S. royalties  

Significant financial resources  
Ability to co-develop and co-commercialize 5 biologics
## 2 Notch Programs
- $35M upfront
- 2 biologic programs
- Up to $344.5M and $349.5M in milestones, respectively
- Royalties
  - Low-double digit to high teens
- GSK option through Ph2 PoC trials
- GSK holds equity stake 8.8%*  
  * per most recent SEC filing

## 5 Wnt Programs
- $40M upfront + $20M for 2011 IND
- 3 biologic & 2 small molecule programs
- Up to $387.5M milestones per biologic, $112M per small molecule
- Royalties
  - Biologics: Mid-single digit to high teens
  - Small molecules: single digit
- Bayer option through Ph1 trials

$191M raised from to date from Bayer & GSK

Up to $145M additional milestones through 2016

**Total raised to date from 3 partners to $368.25M (upfront, milestones, and equity) with significant milestones to come**
### Ongoing Clinical Trials and INDs

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Tumor Type</th>
<th>IND</th>
<th>Ph 1a</th>
<th>Ph 1b</th>
<th>Ph 1b/2</th>
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<tbody>
<tr>
<td>1  Tarextumab</td>
<td>Pancreatic</td>
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<td>ALPINE</td>
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<td>(Anti-Notch2/3, OMP-59R5)</td>
<td>SCLC</td>
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<td>PINNACLE</td>
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<td>2</td>
<td>Ovarian</td>
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<td>SIERRA</td>
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<td>3  Demcizumab</td>
<td>Her2- breast</td>
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<td>(Anti-DLL4, OMP-21M18)</td>
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<td>6  Vantictumab</td>
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<td>(Anti-Fzd7, OMP-18R5)</td>
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<td>15  Anti-DLL4/VEGF</td>
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<td>16  Anti-RSPO3</td>
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Four Drug Candidates in the Notch Pathway

OncoMed’s Notch clinical candidates
- **Demcizumab** (Anti-DLL4)
- **Tarextumab** (Anti-Notch 2/3)
- **Anti-Notch1** (OMP-52M51)
- **Anti-DLL4/VEGF** (OMP-305B83)

- The Notch pathway mediates stem cell self-renewal, proliferation, differentiation
- 5 Notch Ligands
  - DLL1, 3, 4, JAG 1, 2
- 4 Notch Receptors (1,2,3,4)
- Activation of Notch has been implicated in
  - Solid tumors
    - Lung, pancreatic, ovarian, breast cancers, CRC, etc.
  - Hematologic tumors
    - CLL, MCL, DLBCL, etc.

Modified from Ratdke et al., EMBO reports (2005) 6, 1120 - 1125
Demcizumab: A First-in-Class Anti-DLL4 Antibody

• **Phase 1a**: Completed
  - Single-agent activity observed in refractory solid tumor patients

• **Phase 1b**: Ongoing combination chemo studies
  - First-line NSCLC and pancreatic
  - Enhanced response rate and durability (preliminary)

• **Phase 1b/2**: Ongoing
  - Recurrent ovarian cancer

• **Randomized Phase 2**: Planned for 2014/15
  - NSCLC, pancreatic and ovarian

• Studies employ novel truncated dosing regimen
  - Mitigates cardiopulmonary toxicity

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**Phase 1a: Refractory Solid Tumors Waterfall Plot: Best Response**

% Change in Tumor Target Lesions Size

- **30% target lesion reduction**
- Doses represent mg/kg once every other week except * representing mg/kg once weekly dosing

*Smith Mol Targets 2010*
**Demcizumab Phase 1b Pancreatic Cancer Interim Response Rate and Duration**

**First-Line Advanced Pancreatic Cancer**

demcizumab + gemcitabine +/- Abraxane

**Waterfall Plot (N=22 pts)**

- **DEM: 2.5 or 5mg/kg Q2 or 4 Wks**

<table>
<thead>
<tr>
<th>% Change in Tumor Target Lesions</th>
<th>GEM + DEM (N=16)*</th>
<th>GEM**</th>
<th>GEM/Abrax + DEM (N=6)*</th>
<th>GEM/ Abrax**</th>
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</thead>
<tbody>
<tr>
<td>Partial Response (PR)</td>
<td>4 (25%)</td>
<td>7%</td>
<td>3 (50%)</td>
<td>23%</td>
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<tr>
<td>Stable Disease (SD)</td>
<td>7 (44%)</td>
<td>28%</td>
<td>2 (33%)</td>
<td>27%</td>
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<tr>
<td>PR + SD</td>
<td>11 (69%)</td>
<td>35%</td>
<td>5 (83%)</td>
<td>50%</td>
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</table>

* Unconfirmed responses
** Based on Independent Review: vonHoff NEJM 2013

**Phase 1b Study Patients**

**Swimlane Plot (N=28)**

- **GEM/Abrax 2.5 Q2W**
- **5 Q4W**
- **2.5 Q4W**
- **2.5 Q2W**

**Median PFS by Demcizumab Dose (Kaplan-Meier)**

- GEM (MPACT Trial**): 104d
- GEM+DEM (mg/kg): 2.5Q4W: 50d 2.5Q2W: 107d 5Q4W: 176d
- GEM/Abrax + DEM (mg/kg): 2.5Q2W: N/A

*Cubillo et al ASCO GI 2014*
Demcizumab Phase 1b NSCLC
Interim Response Rate and Duration

First-Line Advanced NSCLC
demcizumab + pemetrexed + carboplatin

Waterfall Plot (N=31 pts)

<table>
<thead>
<tr>
<th>% Change in Tumor Target Lesions</th>
<th>Complete Response</th>
<th>Partial Response</th>
<th>Stable Disease</th>
<th>CR + PR + SD</th>
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<tbody>
<tr>
<td>DEM: 2.5, 5 or 7.5 mg/kg Q3 Wks</td>
<td>1 (3%)</td>
<td>13 (41%)</td>
<td>14 (44%)</td>
<td>28 (88%)</td>
</tr>
</tbody>
</table>

Platinum/PEM (Package Insert)

Complete Response 1 (3%)
Partial Response 13 (41%)
Stable Disease 14 (44%)
CR + PR + SD 28 (88%)

Median PFS by DEM Dose (Kaplan-Meier)
- Platinum/PEM (PEM PI): 139d
- Carbo/PEM + DEM: 2.5Q3W:129d, 5Q3W:160d, truncated 7.5Q3W:133d, truncated 5Q3W: not reached

Study Patients

McKeage et al, ASCO, 2014
Tarextumab (Anti-Notch2/3) Antibody

**Phase 1a Study:** Completed
- Well tolerated in refractory solid tumor patients
  - On-target, manageable GI tox
- Prolonged stable disease in multiple tumors
  - Triple-negative breast cancer (JAG1 amplification)

**Phase 1/2 Studies:** Ongoing
- Pancreatic (*ALPINE*)
- Small Cell Lung (*PINNACLE*)
- Personalized medicine program with predictive biomarker
Tarextumab in Two Phase 1b/2 Randomized Phase 2, Proof-of-Concept Trials

**ALPINE**

**OMP-59R5 in Pancreatic Cancer**

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**Ph1b/2 Study in FL Pancreatic Cancer**

**ALPINE**

- **Ph1b:** Safety Run-In N=33
- **Ph2:** First-line Metastatic Pancreatic Ca (Tissue Required) N=124

**Gemcitabine**

- +ABRX + Anti-Notch2/3

**Gemcitabine**

- +ABRX + Placebo

* GEM: 1000mg/m² weekly for 3 weeks, 1 week rest
* Nab-Paclitaxel (abraxane) 125mg/m² weekly for 3 weeks, 1 week rest

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**Ph1b/2 Study in FL Small Cell Lung Cancer**

**PINNACLE**

- **Ph1b:** Safety Run-In N=30
- **ED-SCLC:** N=120 (Tissue Required)

**EP**

- x 6 + Anti-Notch2/3

**ED-SCLC**

- N=120
- 1:1
- To PD

**EP**

- x 6 + Placebo

* EP (etoposide 100 mg/m² on days 1 through 3; cisplatin 80 mg/m² day 1 or carboplatin AUC of 5 mg/mL/min Day 1 every 3 weeks)

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**ALPINE**

OMP-59R5 in Pancreatic Cancer
First-Line Advanced Pancreatic Cancer

TAR + gemcitabine +/- Abraxane

Waterfall Plot (N=21 pts)

% Change in Tumor Target Lesions

30% target tumor reduction

Predictive Biomarker: Tumor Notch3

Tissue sample:
Immunohistochemistry (IHC) for Notch3

Safety: No DLTs: Combination well tolerated: mild/mod diarrhea
Minimal additional chemotherapy tox
**PINNACLE: SCLC Study**
Interim Phase 1b Data

**First-Line Extensive Disease Small Cell Lung Cancer**
*Tarextumab+ Cisplatin + Etoposide*

**Predictive Biomarker: Tumor Notch3**

*Tissue sample: Immunohistochemistry (IHC) for Notch3*

Waterfall Plot (N=10 pts)

<table>
<thead>
<tr>
<th>% Change in Tumor Target Lesions</th>
<th>TAR 5 mg/kg</th>
<th>TAR 7.5 mg/kg</th>
<th>TAR 10 mg/kg</th>
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**Safety:** One DLT: Gr3 nausea/vomiting (10mg/kg)
Combination well tolerated: mild/mod diarrhea
Minimal additional chemotherapy tox

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<tr>
<th>Response</th>
<th>EP + TAR (N=10)*</th>
<th>EP**</th>
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<tbody>
<tr>
<td>Partial Response</td>
<td>9 (90%)</td>
<td>67%</td>
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<tr>
<td>Stable Disease</td>
<td>1 (10%)</td>
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<tr>
<td>PR + SD</td>
<td>10 (100%)</td>
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</table>

* Unconfirmed responses
** Based on Ph3 meta-analysis data: Rossi, JCO 2012

Spigel ASCO 2014
Anti-Notch1 (OMP-52M51): Phase 1 Trials in Hematologic and Solid Tumors

Phase 1a Solid Tumor Study (ongoing)

- **N=13** (Dose levels: 0.25 to 2.5mg/kg)
- Safety: on target, manageable GI tox
- Biomarker: Reduction of circulating tumor cells (CTCs)
- Efficacy: Prolonged disease control in breast and colorectal
  - CEA tumor marker decline

*Fabbri et al. 2011, JEM

*Preclinical Data: Patient-derived Breast Cancer Model (Identified Predictive Biomarkers)

*Cancilla AACR 2013

*Patients on Study

*Davis et al  AACR-NCI-EORTC Mol Targets & Cancer Therapeutics, Boston 2013
Two Drug Candidates Targeting the WNT Pathway

OncoMed’s Wnt clinical candidates:
- Vantictumab (Anti-Fzd7)
- Fzd8-Fc (OMP-54F28)

- Wnt signaling is essential for self-renewal of CSCs
- Wnt altered in many tumors:
  - Mutations of Wnt pathway genes
    - APC (CRC, prostate, melanoma)
    - Axin 1 (HCC, endometrial)
    - β-catenin (CRC, HCC, pancreatic)
  - Over-expression Wnt pathway
    - Wnt ligands, LRP5, FZDs
    - Occurs in: HCC, Breast, Lung
  - Epigenetic silencing of negative regulators of Wnt pathway
    - e.g. DKKs, SFRPs, WIF-1
    - Occurs in: ALL, Sarcoma, Breast, Lung
Vantictumab (Anti-Fzd7) WNT Pathway Antibody

- First Wnt pathway antagonist antibody in the clinic
- Strong preclinical synergy with chemotherapy and targeted agents
- Three Phase1b trials initiated in 2013
  - VAN + paclitaxel in Breast
  - VAN + docetaxel in NSCLC
  - VAN + GEM/Abraxane in Pancreatic
- Predictive biomarkers for patient selection

Binds to Fzd 1, 2, 5, 7, 8

Preclinical Data: Alcian Blue Staining of Mucin-containing Cells in Pancreatic Tumor (Duct Epithelial Cell Fate)

Control

Anti-Fzd7

Gemcitabine

Anti-Fzd7+ gem (Small residual tumor)
**Vantictumab**
**Interim Phase 1 Clinical Data**

- **Phase 1a Study:** Dosing complete
  - N=29 (Dose levels: 0.5 to 15mg/kg)
  - Safety: Vantictumab is well tolerated
    - Bone protection strategy
  - Biomarker: Modulation of WNT pathway in patient samples
  - Efficacy: Single-agent activity in 3/3 NET pts (pNET and Carcinoid)

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**Patients on Study**

- Days on study
- Vertical lines: tumor assessments
- ▶️ = Active
- = Neuroendocrine tumor

**Single-Agent Activity in NET**

- First-line Tx
- Second-line Tx
- VAN Tx

*Smith et al European Cancer Congress (ECC) 2013*
Fzd8-Fc (OMP-54F28) in Phase 1

Three Phase 1b studies initiated in 2014

- Fzd8-Fc + chemo: three solid tumor indications
  - 54F28 + GEM/Abraxane in Pancreatic
  - 54F28 + Nexavar in Hepatocellular
  - 54F28 + carbo/tax in Ovarian
- Predictive biomarkers for patient selection

Phase 1a study: Refractory Solid Tumors

- N=26 (Dose levels: 0.5 to 20mg/kg)
- Safety: well tolerated; one mod. Fx; bone risk mitigation; distinct safety from VAN (taste, muscle cramps, alopecia)
- Biomarker: WNT pathway modulation
- Efficacy: Potential early activity: 9 pts SD ≥112 days

Patients on study

- Squamous cell carcinoma of tonsil
- Basal cell carcinoma
- Thyroid cancer
- Non-squamous NSCLC
- Non-seminoma germ cell tumor
- Desmoid tumor
- Renal cell carcinoma
- Pancreatic cancer

Days: 0 56 112 168 224 280 336 392

Jimeno, ASCO 2014
Two Potential INDs in 2014/15

**Anti-DLL4 + anti-VEGF (OMP-305B83)**
- Proprietary bispecific antibody technology
- Preclinical anti-tumor efficacy demonstrated
  - Potential improved activity relative to anti-DLL4 or anti-VEGF

**Anti-RSPO3 (OMP-131R10)**
- RSPOs are the ligands for LGR receptors
- Multiple therapeutic opportunities
- Strong predictive biomarker strategy
- Broad, issued claims cover therapeutic antibodies that disrupt RSPO-LGR signaling
OMED Financial Snapshot

- **Cash**: $283.9M as of 3/31/14
- **2014 Financial Guidance**:
  - $90-95M operating expenses
  - EOY cash of $215M+
- **Estimated cash through at least 2016**, excluding future potential milestones
- **Total of $621.9M raised since 2004 inception (as of 12/31/13)**:
  - $303.2M equity financings (including $94M IPO in 2013)
  - $317.5M in collaboration funding from partnerships
  - $1.2M in grant funding
- **Shares outstanding**: 29.5 million

* cash, equivalents, and short term investments
### OncoMed Milestones

#### 2H 2013
- IPO: $94M
- $177.25M upfront Celgene Collaboration
- $10M Milestone: VAN Bayer
- $15M Milestone: Fzd8-Fc Bayer
- **ECC 2013**: VAN Ph1a
- **AACR-EORTC-NCI**: DEM, VAN, TAR, Fzd8-Fc
- Initiated Ph1b VAN HER2-
- Initiated Ph1b VAN Pancreatic
- Initiated Ph1b VAN NSCLC
- Initiated Ph1b/2 DEM Ovarian

#### 1H 2014
- **ASCO GI**: DEM, TAR
- **AACR**: Nine Presentations Anti-DLL4/anti-VEGF; anti-RSPO3; DEM; TAR; Fzd8-Fc, etc.
- **ASCO**: DEM, TAR, Fzd8-Fc
- **EHA** Presentation
- Initiate Ph1b Fzd8-Fc Pancreatic
- Initiate Ph1b Fzd8-Fc Hepatocellular
- Initiate Ph1b Fzd8-Fc Ovarian

#### 2H 2014
- **ECC 2014**: Presentations*
- **EORTC-NCI-AACR 2014** Presentations*
- **SABCS 2014**: Presentation*
- Initiate Ph2 TAR (ALPINE)
- Initiate Ph2 TAR (PINNACLE)
- Initiate Ph2 DEM NSCLC
- Initiate Ph2 DEM Pancreatic
- Potential IND anti-DLL4/anti-VEGF

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* Pending
** Future financial milestones undisclosed
Proprietary Discovery Capabilities

- Targeting critical oncology pathways
- Pipeline of potential first-in-class oncology therapeutics
- All discovered at OncoMed; robust IP portfolio

Deep Clinical Pipeline

- Five clinical programs advancing to Phase 2 (>375 pts)
- Early evidence of clinical activity
- Data from multiple randomized Phase 2 trials by 2015-16

Strong Long-Term Outlook

- Partnerships with Celgene, Bayer and GSK
- Multiple billions in future milestones
- Ongoing discovery research