

# RECAP THERAPEUTIC AREA INSIGHTS

## ONCOLOGY DEAL MAKING & DEVELOPMENT TRENDS, 2008-2012

Oncology is one of the largest and fastest growing therapeutic areas in terms of drug development activity. From 2008-2012 there were 131 oncology M&A transactions worth a total disclosed value of \$92 billion and 569 oncology license and joint venture deals worth a total of \$44.7 billion. In this report, we analyze the last five years of oncology licensing and M&A deals to provide insight into this important segment for the biopharmaceutical industry. Included is a special section containing benchmark metrics for more than 633 oncology indication pursuits by a defined set of companies that reached an outcome of success (market) or failure (termination), as well as a breakdown of development and FDA review times for oncology drugs approved in 2012.

### CHOOSE THE RIGHT TIME TO PARTNER YOUR ONCOLOGY ASSET

Phase II oncology assets earned the largest step-up in committed cash for license and joint venture deals between 2008-2012: Phase II assets earned a median upfront fee of \$31.5 million for Sellers, a 142% jump from the \$13 million paid for Phase I assets. Recap data suggest that no other stage confers a comparable premium.

### DRIVE YOUR ONCOLOGY DEAL NEGOTIATIONS WITH DATA

Did you know that milestone payments for Phase III and Licensure Filing events built into deal structures are 30% higher on average for oncology assets than for other therapeutic areas (TAs)? Or that the average disclosed deal size for oncology licenses and JVs was nearly double that of all other TAs in 2012? Use our Excel spreadsheets of 569 licenses and joint ventures and 131 M&A transactions from the past five years –with up to 29 data points for each record –to run analyses of your own and bring some hard data to the negotiating table.

### MANAGE RISK & DEVELOP A BETTER UNDERSTANDING OF THE PROBABILITY OF SUCCESS IN ONCOLOGY

73% of oncology drugs fail in Phase II development, according to Recap data (Phase II failure rates rise even further for un-partnered assets). And the probability of success varies widely by tumor type: For example, in the last two decades, a mere 8% of drugs tested for

solid tumors have reached market in the US or EU versus 19% of drugs tested for hematologic malignancies. Use your knowledge of these probabilities to help craft deals that are designed by you to manage risk and optimize success at every stage.

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8. \$1.9B Acceleron/Celgene: ACE-011 (sotatercept) bone-forming protein (2008)
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10. \$1.4B OncoMed/Bayer: Option deal for small molecule and biologic Wnt pathway inhibitors (2010)
11. \$1.3B Dicerna/Kyowa Hakko: Discovery of RNAi-based therapeutics using Dicer Substrate Technology (2010)
12. \$1.3B Incyte/Novartis: INCB18424 (ruxolitinib) JAK inhibitor and INCB28060 (2009)
13. \$1.2B Exelixis/Sanofi-Aventis: XL147, XL765 and PI3K alpha and beta inhibitors [TERMINATED 12/11] (2009)
14. \$1.2B Exelixis/Bristol-Myers Squibb: XL184 (cabozantinib) and XL281 [TERMINATED 10/2011] (2008)

REPORT DATE  
& FORMAT  
April 2013  
1 Adobe PDF file  
2 Excel  
spreadsheets

ONCOLOGY DEALS  
INCLUDED  
569 Licenses  
& Joint Ventures  
131 M&A  
transactions  
*Detailed Excel files  
allow you to do your  
own analyses*

CHARTS & GRAPHS  
40+charts & tables  
*For easy insertion  
intoreports and  
presentations*

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- 15. \$1.1B Facet Biotech (Abbott)/Bristol-Myers Squibb: Elotuzumab anti-glycoprotein CS1 antibody (2008)
- 16. \$1.1B Genmab/Janssen Biotech: HuMax-CD38 (daratumumab) and back up mAb(2012)
- 17. \$1.1B MacroGenics/Servier: Option deal for Dual-Affinity Re-Targeting (DART) products (2012)

**Oncology M&A Activity, 2008-2012**

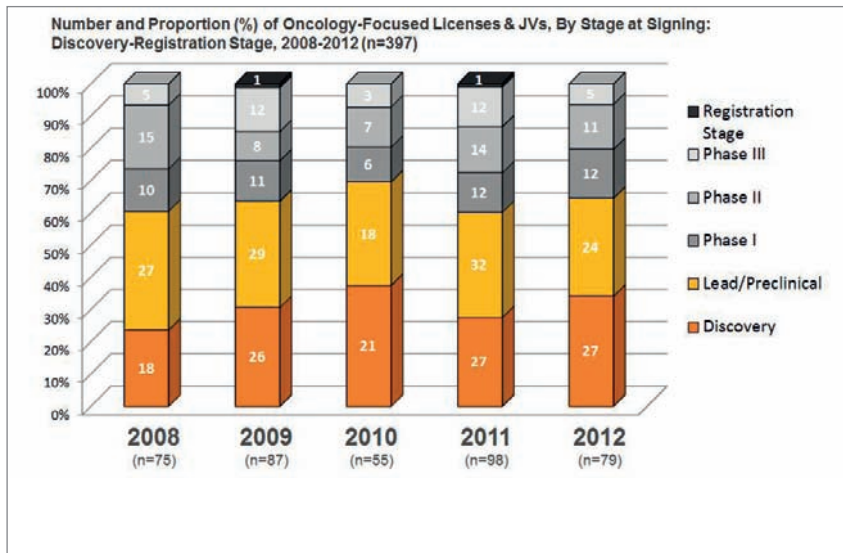
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**Deal Snapshots for Top Ten Oncology M&A Transactions**

- 26. \$46.8B Roche Acquires Genentech (2008)
- 27. \$8.8B Takeda Acquires Millennium (2008)
- 28. \$6.5B Lilly Acquires ImClone (2008)
- 29. \$4.0B Astellas Acquires OSI Pharmaceuticals (2010)
- 30. \$3.6B Celgene Acquires AbraxisBioscience (2010)
- 31. \$2.6B Daiippon Sumitomo Pharma Acquires Boston Biomedical (2012)
- 32. \$1.2B Amgen Acquires Micromet(2012)
- 33. \$1.0B Amgen Acquires BioVex(2011)
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- 35. \$935M Daiichi Sankyo Acquires Plexikon(2011)

**Special Section: Oncology Clinical Development Trends**

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ONCOLOGY LICENSING & JV TRENDS, 2008-2012  
DEAL ACTIVITY SHOWS A DOMINANT & SUSTAINED FOCUS ON EARLY STAGE ASSETS

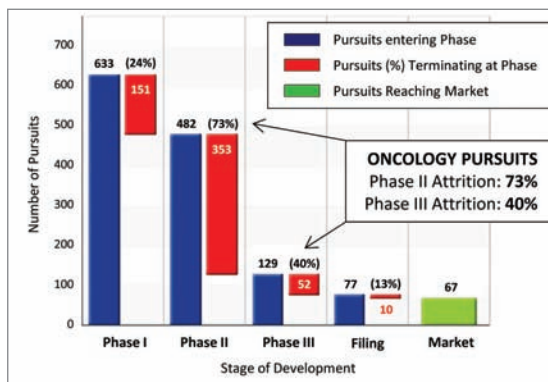
SAMPLE CHART FROM ONCOLOGY LICENSING SECTION OF REPORT  
Chart No.2: The chart above shows that 70% or more of oncology product and platform technology licenses executed in each of the last five years have been for assets at early stages of development (defined here as Discovery stage, Lead/Preclinical or Phase I). NOTE: Chart excludes deals with the following stages at signing: Unknown (15), Not Applicable (140), Approved (9) and Reformulation (12).

<p>Target Company</p> <p><b>Cougar Biotechnology</b> (Public. NASDAQ: CGBR)</p> <p>Cougar Biotechnology develops oncology therapeutics.</p> <p>Market Segment: <b>Therapeutic Products</b></p> <p>Leading Technology: <b>Small Molecules</b></p> <p>Therapeutic Area: <b>Cancer</b></p> <p>Most Advanced Product Stage: <b>Phase III</b></p> <p>Leading Products: <b>Abiraterone acetate (CB7630), Noscapine (CB3304), Seocalcitol (CB1089)</b></p>	<p>Deal Value (USD): <b>\$970M</b></p> <p>Prior Year Total Revenues (USD): <b>\$0.00M</b></p> <p>Cash On Hand at Acquisition (USD): <b>\$75.8M</b></p> <p>Shares Outstanding: <b>20.78M</b></p>	<p>Acquirer</p> <p><b>Johnson &amp; Johnson</b></p> <p>Upfront Cash (USD): <b>\$970M</b></p> <p>Contingent Payments (USD): <b>n/a</b></p> <p>Offer Price per Share: <b>\$43.00</b></p> <p>Prior Close Sh. Price Premiums: <b>18% (1-Day), 23% (5-Day), 26% (30-Day)</b></p>
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JOHNSON & JOHNSON ACQUIRES COUGAR BIOTECHNOLOGY

SAMPLE "DEAL SNAPSHOT" FROM M&A SECTION OF REPORT  
Chart No. 34: Recap's proprietary "M&A Snapshot" graphic distills important aspects of both private and public company acquisition events into a readable, information-packed format that is ideal for inserting into reports or presentations.

- 39. Clinical Development & FDA Review Times: Oncology vs. All Other Therapeutic Areas
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SAMPLE CHART FROM CLINICAL DEVELOPMENT SECTION OF REPORT  
Chart No. 36: Chart depicts 633 oncology pursuits that either terminated or reached market in the U.S. or EU between 1985 and 2012 (ongoing pursuits are not included). Oncology indication pursuits shown were undertaken by Development Optimizer companies. Development Optimizer is a database containing the detailed clinical development histories of more than 370 biopharmaceutical companies selected by Recap analysts.

**ADDITIONAL REPORT CONTENT**

**Two Excel Files Containing the Raw Data**

1.569 License, Joint Venture and Asset Purchase Transactions, 2008-2012. 131 M&A Transactions, 2008-2012

Deal Subject	Transaction Type	License Subtype	Asset Type	Asset Subtype
Anti-OX40 immunotherapeutic antibodies for cancer worldwide	License	Collaboration	Product	Product(s) Only
FF284 (Debio 1347) and companion diagnostic for cancer worldwide	License	Collaboration	Product	Product(s) Only
ISIS-STAT3Rx plus discovery of antisense therapeutics against five cancer targets	License	Collaboration	Product	Product(s) Plus Platform Technology
GA101 (obinituzumab) anti-CD20 monoclonal antibody for hematologic malignancies in Japan	License	Co-Development	Product	Product(s) Only
Nuclease based genome engineering technologies to develop allogeneic T-cell immunotherapy for leukemia	License	Collaboration	Technology	Drug Discovery Technology
Bond Oracle HER2 IHC System companion diagnostic for use with NeuVax (nelipepimut-S) for breast cancer	License	Collaboration	Product	Product(s) Only
Immunoconjugate biologic products for breast and pancreatic cancer	License	Collaboration	Product	Product(s) Only
Anti-cancer small molecule compounds targeting Ras signaling pathway worldwide	License	Basic License	Product	Product(s) Only
Maytansinoid TAP technology to develop anticancer therapeutics against undisclosed target	License	Basic License	Technology	Drug Modification Technology

DATA COLUMNS INCLUDED FOR LICENSING TRANSACTIONS (NOT ALL FIELDS WILL CONTAIN A VALUE FOR EVERY DEAL):

1.Seller; 2.Buyer; 3.Date; 4.Year; 5. Announced Deal Size; 6. Upfront; 7. Equity; 8. R&D Funding; 9. Total Milestones; 10. Development & Regulatory Milestones; 11. Sales Milestones; 12 Contingent Equity; 13. Lump Sum Payment(s) -Breakdown Unknown; 14. Royalty; 15. Profit Split; 16. Deal Subject; 17. Transaction Type; 18. License Subtype; 19. Asset Type; 20. Asset Subtype; 21. Main Therapeutic Area; 22. Therapeutic Area(s) -All; 23. Indication(s); 24. Main Technology; 25. Technology -All; 26. Stage at Signing; 27. No. of Products or Options; 28. Current Status; 29. Territory

**SAMPLE EXCERPT FROM EXCEL FILE OF 2008-2012 ONCOLOGY M&A TRANSACTIONS**

Target Company	Acquirer	Date	Year	Description	Transaction Type
EpiCept	Immune Pharmaceuticals	11/08/2012	2012	Reverse merger agreement with public company EpiCept in all-stock transaction	Reverse Merger
VectorLogics	DNatrix	10/23/2012	2012	Acquisition of VectorLogics	Acquisition - Full (100%)
Compendia Bioscience	Life Technologies Corporation	10/18/2012	2012	Acquisition of Compendia Biosciences	Acquisition - Full (100%)
Eclipse Therapeutics	Bionomics	09/17/2012	2012	Acquisition of Eclipse Therapeutics for \$10M in equity	Acquisition - Full (100%)
Pinpoint Genomics	Karolinska Development AB	07/25/2012	2012	Acquisition of Pinpoint Genomics for undisclosed sum	Acquisition - Full (100%)
Aprea AB	Agilent Technologies	06/13/2012	2012	Acquisition of majority stake in Aprea AB, increasing ownership in Aprea to 69.4%	Acquisition - Majority Stake (50-99%)
Dako	Jazz Pharmaceuticals	05/17/2012	2012	Acquisition of cancer diagnostics company Dako for \$2.2 billion in cash	Acquisition - Full (100%)
EUSA Pharma	Arrowhead Research Corporation	04/11/2012	2012	Acquisition of EUSA Pharma for \$650M in cash and up to \$50M in sales milestones	Acquisition - Full (100%)
Alvos Therapeutics	Spectrum Pharmaceuticals	04/05/2012	2012	Acquisition of in vivo phage display company Alvos, library of targeting peptides	Acquisition - Full (100%)

DATA COLUMNS INCLUDED FOR M&A TRANSACTIONS (NOT ALL FIELDS WILL CONTAIN A VALUE FOR EVERY DEAL):

1. Target Company; 2. Acquirer; 3. Date; 4. Year; 5. Description; 6. Transaction Type; 7. Size; 8. Upfront; 9. Equity; 10. Total Milestones; 11. Development & Regulatory Milestones; 12. Sales Milestones; 13. Contingent Equity; 14. Target Company Market Segment; 15. Target Company Therapeutic Area; 16. Target Company Technology; 17. Target Company Leading Product Stage; 18. Target Company Leading Product(s); 19. Public/Private Status of Target Company; 20. Offer Price Per Share; 21. 1-Day Share Premium; 22. 5-Day Share Premium; 23. 30-Day Share Premium; 24. Target Company TSO (Public); 25. Target Company Investors (Private)

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