

Monoclonal Antibodies

INDUSTRY SUMMARY

COGENT VALUATION identified **Monoclonal Antibodies** publicly traded companies, IPOs, and recent M&A transactions within the Monoclonal Antibodies industry, which provides a basis for market and transaction pricing that can be used by your firm in estimating market sentiment and its impact on your firm's value. Over the last year since September 30, 2017, the median 52-week share price return of the Monoclonal Antibodies industry was 24.4%. Between September 30, 2016 and September 30, 2018, the median EV/Revenue multiple increased from 8.4 to 8.5. This industry is not profitable and all other valuation multiples based on profitability metrics were not meaningful. The median revenue growth and EBITDA margins for the industry for the quarter were -5.5% and -53.2%, respectively.

Public Company Key Statistics

Median 52-Week
Return

24.2%

Median 3-Year CAGR
Return

2%

Median EV/Revenue
Multiple

8.5x

Comparable Public Company Market Price Returns as of September 30, 2018

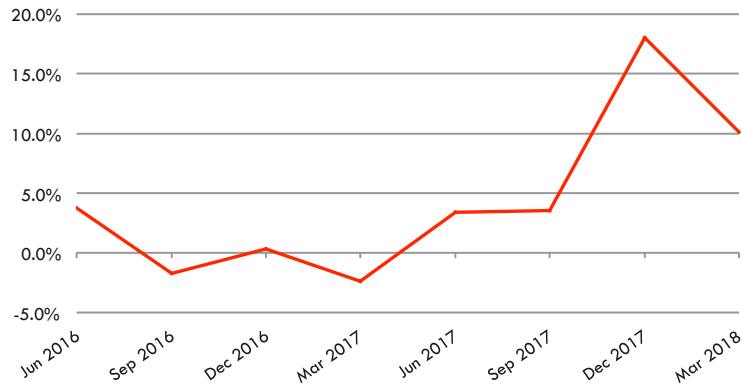
	YTD	3 Month	1 Year	2 Year	2017	2016	2015	2014
Alder Biopharmaceuticals, Inc.	45.4%	24.4%	-45.0%	-38.9%	-45.0%	-37.0%	13.5%	N/A
AVEO Pharmaceuticals, Inc.	18.6%	-22.1%	416.7%	73.7%	416.7%	-57.1%	50.0%	-54.1%
Celldex Therapeutics, Inc.	76.8%	34.2%	-19.8%	-47.9%	79.7%	-77.4%	-14.1%	-24.6%
Halozyme Therapeutics, Inc.	-10.3%	-78.4%	105.1%	13.7%	-19.8%	-43.0%	79.6%	-35.6%
Immunomedics, Inc.	28.9%	-13.9%	340.3%	185.1%	105.1%	19.5%	-36.0%	4.3%
Infinity Pharmaceuticals, Inc.	33.5%	62.0%	50.4%	-60.3%	340.3%	-82.8%	-53.5%	22.3%
Omeros Corporation	25.6%	-9.0%	95.9%	40.5%	50.4%	-36.9%	-36.5%	119.5%
OncoMed Pharmaceuticals, Inc.	-48.3%	62.4%	-46.8%	-47.8%	95.9%	-65.8%	3.6%	-26.3%
PDL BioPharma, Inc.	-4.0%	-27.4%	29.2%	-17.9%	-46.8%	-40.1%	-54.1%	-8.6%
Peregrine Pharmaceuticals, Inc.	52.9%	-20.4%	N/A	-33.7%	29.2%	-73.6%	-15.8%	0.0%
Repligen Corporation	15.8%	30.0%	17.7%	17.3%	17.7%	8.9%	42.9%	45.2%
Sorrento Therapeutics, Inc.	-50.6%	39.8%	-22.4%	-55.0%	-22.4%	-43.7%	-13.5%	24.3%
XOMA Corporation	29.4%	3.2%	743.6%	14.3%	743.6%	-84.1%	-63.0%	-46.7%
Median of Industry Public Companies	22.1%	-3.3%	39.8%	-17.9%	50.4%	-43.7%	-14.1%	-4.3%

Multiple year periods are calculated as the average annual return.

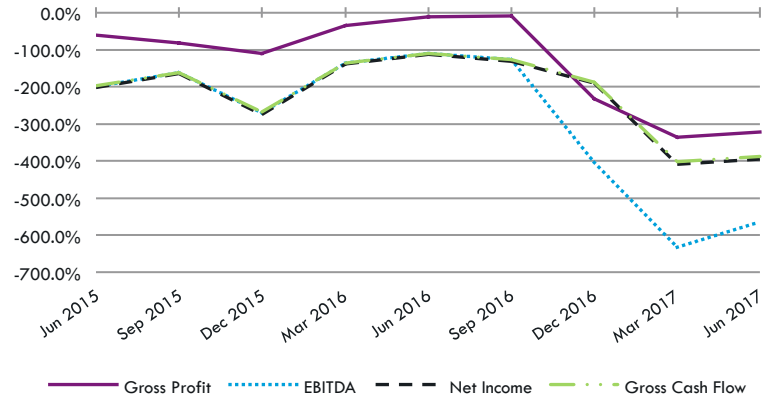
■ Highest Return
 ■ Lowest Return
 ■ Median Return

Industry Revenue Growth and Profit Margins for the Past Two Years

Median Quarterly Revenue Growth of All Monoclonal Antibodies Companies



Median Gross Profit, EBITDA, Net Income, and Gross Cash Flow Margins



Industry Initial Public Offerings—Monoclonal Antibodies (dollars in millions, except share prices)

Offer Date	Company Name	Offer Price	Shares Offered	Amount Raised	Total Assets	Debt	LTM Revenues	LTM EBITDA	LTM Net Income	LTM Cash Flows
8/13/18	Aridis Pharmaceuticals, Inc.	\$13.00	0.0	\$8.8	\$24.8	\$0.0	\$1.2	(\$45.2)	(\$48.9)	(\$43.0)
7/19/18	Provention Bio, Inc.	\$4.00	4.0	\$40.0	\$44.4	\$12.5	\$0.0	(\$6.4)	(\$6.6)	(\$6.4)
6/27/18	Forty Seven, Inc.	\$16.00	6.7	\$100.0	\$98.5	\$67.9	\$0.0	(\$13.6)	(\$31.3)	(\$13.5)
5/23/18	Kiniksa Pharmaceuticals, Ltd.	\$18.00	29.2	\$86.9	\$116.8	\$0.0	\$0.0	(\$55.2)	(\$57.1)	(\$53.7)
1/25/18	ARMO BioSciences, Inc.	\$17.00	24.6	\$902.6	N/A	\$61.7	\$0.0	\$1,390.9	\$1,158.0	\$1,391.1
12/17/17	Fusion Antibodies plc	\$1.09	5.8	\$35.0	\$344.4	\$14.7	\$2.4	(\$22.6)	(\$35.7)	(\$18.1)
	Median of all IPOs	nm	nm	\$63.4	\$98.5	\$13.6	\$1.2	(\$18.1)	(\$33.5)	(\$15.8)

Multiple year periods are calculated as the average annual return.

■ Highest Return
 ■ Lowest Return
 ■ Median Return

Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions)

Transaction Date	Target	Acquirer	Transaction Size	% Bought
8/31/18	Visterra, Inc.	Otsuka America, Inc.	\$430.0	100%
1/22/18	Hunan ProMab Biotechnologies	NanHua Bio-medicine Co.	\$7.7	100%
8/22/17	U-Protein Express B.V.	ImmunoPrecise Antibodies	\$8.2	100%
12/20/16	Ganymed Pharma	Astellas Pharma Inc.	\$1,401.6	100%
6/30/16	EPIRUS Biopharmaceuticals	Polpharma SA Pharmaceutical	\$3.5	100%
5/31/16	Effimune SA	OSE Pharma SA	\$34.4	100%
4/18/16	Biotie Therapies Corp.	Acorda Therapeutics, Inc.	\$341.6	100%
10/30/15	Dyax Corp.	Shire Pharmaceuticals	\$5,907.0	100%
9/11/15	PacificGMP, Inc.	Ligand Pharmaceuticals	\$178.0	100%
6/1/15	X-BODY, Inc.	Juno Therapeutics, Inc.	\$42.8	100%

■ USA
 ■ International
 ■ Highest
 ■ Lowest
 ■ Median

(Continued on next page)

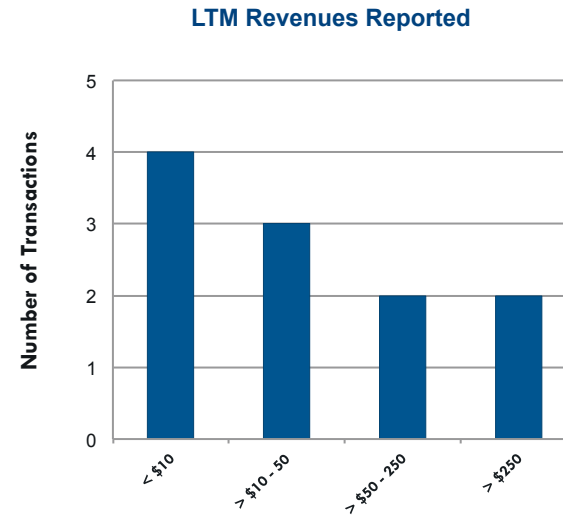
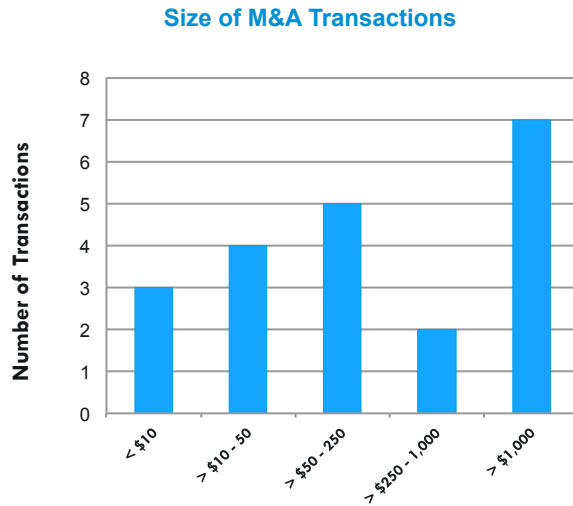
Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions)

(Continued from previous page)

Transaction Date	Target	Acquirer	Transaction Size	% Bought
3/12/15	KBI Biopharma Inc.	JSR Corporation	\$100.0	100%
3/3/15	SuppreMol GmbH	Baxter International Inc.	\$223.9	100%
9/23/14	CFR Pharmaceuticals	Abbott Investments	\$2,659.3	73%
4/30/14	Shanghai PrimeGene	R&D Systems China	\$18.8	100%
12/31/13	Santarus, Inc.	Salix Pharmaceuticals	\$2,154.4	100%
8/2/12	Human Genome Sciences Inc.	GlaxoSmithKline plc	\$3,682.2	100%
4/18/12	Epitomics, Inc.	Abcam Plc	\$153.9	100%
3/5/12	Micromet, Inc.	Amgen Inc.	\$1,016.4	100%
Median of the 18 M&A Transaction Targets			\$166.0	100%

USA
 International
 Highest
 Lowest
 Median

Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions) as of September 30, 2018



COGENT VALUATION is a nationally recognized full service business valuation firm that has provided independent valuation and financial advisory opinions in thousands of situations since 1991. These assignments include the valuation of companies and pass-through entities, their securities, and their intangible assets ranging in size from small, closely-held businesses and start-ups, to corporations with market values over a billion dollars, covering almost every industry and all types of transactions. With the collective backgrounds of our managing directors and professional staff, Cogent Valuation brings substantial large deal experience to bear on our middle market transaction opinions. Cogent Valuation utilizes proprietary research, intensive due diligence, and the experience and insights of its professionals to produce thoughtful, well-documented opinions that have consistently withstood the scrutiny of clients and their advisors, investors, regulators, and courts.

This industry research is provided at no charge to Cogent Valuation's clients. Research or detailed information not covered in this report can be obtained for a fee. **Contact Steven Kam at 415-392-0888 or kam@cogentvaluation.com** for additional information or questions in connection with this research report.

Definitions of Financial Terms Used in this Quarterly Industry Update:

Enterprise Value (EV): Market Value of Equity + Market Value of Debt —Cash

Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA): Profitability metric sometimes also referred to as operating profit or operating earnings.

Gross Cash Flows: Net Income + Depreciation and Amortization Expense

Latest Twelve Months (LTM): Financial information is as of the latest twelve months through the date of this Quarterly Industry Update.

Disclosures and Limitations: This research report is for informational and discussion purposes only. Information presented herein is not investment advice of any kind to any person and does not constitute a recommendation as to the purchase or sale of any interests or as to any other course of action. General, financial, and statistical information concerning the details of this report and related industry are from sources Cogent Valuation believes to be reliable. Cogent Valuation has accurately reflected such information in this research report; however, Cogent Valuation makes no representation as to the sources' accuracy or completeness and has accepted this information without further verification. Neither all nor any part of the content of this report may be conveyed to the public through advertising, public relations, news, sales, mail, direct transmittal, or other media without the prior written consent of Cogent Valuation. Cogent Valuation's research is as of the date reported herein. Cogent Valuation has no affiliation with any of the companies comprising the industry used as a basis for research in this report, nor does Cogent Valuation hold any investments in the companies listed herein. The content of this report may be used, in part, as a basis for any work that Cogent Valuation performs for you in the future at the sole discretion of Cogent Valuation. THIS REPORT IS NOT TO BE USED OR CONSIDERED UNDER ANY CIRCUMSTANCE BY ANYONE AS INVESTMENT ADVICE.