

WEBINAR

*Life Sciences Investment Outlook—
Will Preclinical Companies Continue
to Command Premium Valuations and
Access to Capital in a Less Robust Market?*

DECEMBER 4, 2018





Webinar Guidelines

- Participants are in listen-only mode
- Submit questions via the Q&A box on the bottom right panel
- Questions will be answered as time permits
- Offering 1.0 CLE credit in California and New York*

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WEBINAR

Speakers



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Agenda

- Market Overview
 - 2018 Life Sciences IPO Market
 - 2018 IPO Trends for Preclinical Companies

- Discussion
 - Key Drivers
 - Role of New Technologies and New Targets
 - Post-IPO Secondary Markets and Access to Capital
 - 2019 Outlook

The background of the slide is a blurred photograph of a laboratory. In the upper left, a yellow-tipped pipette is visible. Below it, several test tubes with orange and red caps are arranged in a rack. The overall lighting is warm and soft, creating a professional yet approachable atmosphere.

Market Overview

Macroeconomic Overview

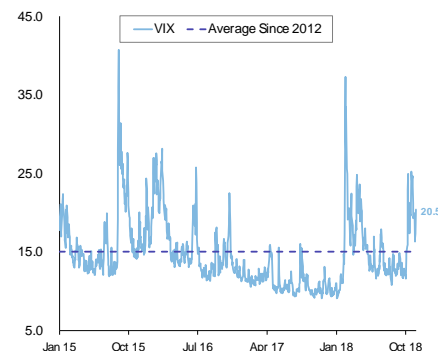
MARKET COMMENTARY

- Broader market indices faced challenges in recent weeks, as **both the Dow and S&P 500 erased nearly all gains for the year**, closing 5.3% and 6.6% respectively off their **2018 highs in late Q3 / early Q4**
- High performing growth sectors have seen outsized pressure as **investors began shifting towards more of a risk-off and defensive mentality**
- New issuance has dramatically slowed in recent weeks as the **VIX has seen several spikes above 20**
- Despite the recent turmoil, the sector has **historically seen bouts of instability and double-digit declines**, pointing to the cyclical nature of the current selloff

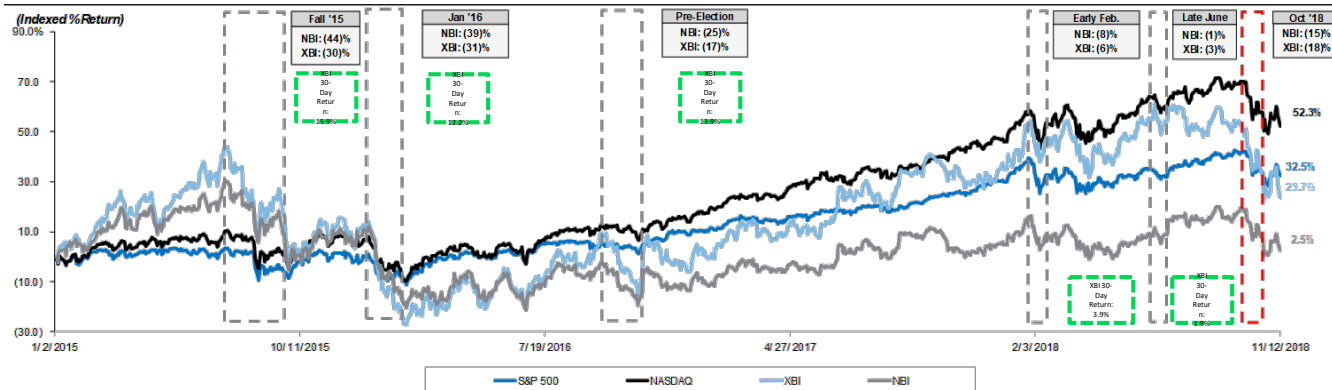
PERFORMANCE SUMMARY

Indices	Last Close	Price Performance %		
		Since Oct.	2018 YTD	Since 2017
Broader Market Indices				
Dow	25,413.2	(3.9%)	2.8%	28.6%
S&P 500	2,736.3	(6.1%)	2.3%	22.2%
Nasdaq	7,247.9	(9.9%)	5.0%	34.6%
VIX	18.1	49.7%	64.3%	29.2%
Biotech Market Indices				
NBI	3,304.2	(13.9%)	(1.6%)	19.2%
XBI	79.5	(17.1%)	(6.3%)	34.3%

MARKET VOLATILITY



EQUITY MARKET PERFORMANCE



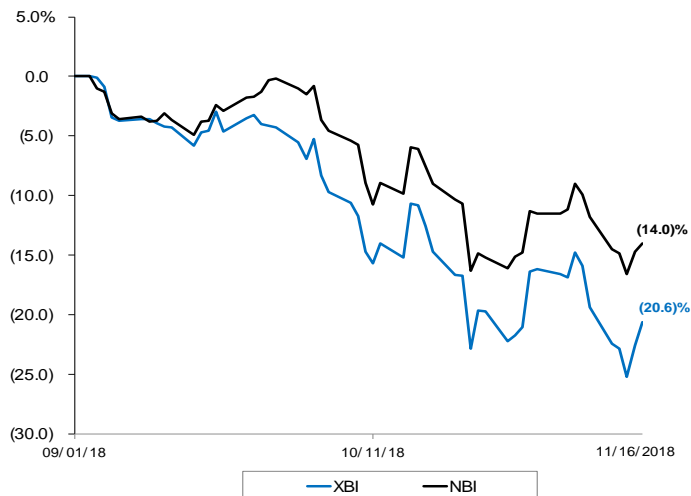
Biotech Markets Experienced Recent Headwinds

MARKET COMMENTARY

- October was the worst performing month for the XBI (-17%) since Jan. 2016:
 - October 24 marked the index's **worst session since 2011** and its third worst day since inception in 2006
 - Over \$1 billion of value in the XBI has been lost since September**, equating to ~21% of the total market value of the XBI's constituents
 - The index has finished **down 25 of the 36 trading sessions thus far in Q4**
 - November performance has been relatively flat as the **XBI is up ~1% month-to-date** and looks to snap a 2-month losing streak

POST-LABOR DAY BIOTECH SELL-OFF

(Indexed % Return)



XBI MONTHLY RETURNS SINCE 2015

	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
2018	10.02	(3.22)	(2.91)	(0.85)	8.84	0.55	0.11	5.09	(4.26)	(17.48)	0.52	
2017	9.65	8.18	(1.24)	3.03	(5.22)	13.99	1.28	7.24	3.27	(3.38)	(0.54)	2.02
2016	(27.99)	(5.24)	7.85	4.39	7.64	(6.84)	14.77	(3.19)	10.32	(15.30)	11.61	(5.55)
2015	7.07	7.50	5.06	(8.50)	15.43	5.91	1.27	(13.06)	(15.91)	7.04	8.49	(2.89)

	Pre-Labor Day	Post-Labor Day
Biotech Market Indices	Price Performance %	Price Performance %
NBI	14.5%	(14.0%)
XBI	18.0	(20.6)
Mean	16.2%	(17.3%)
Median	16.2	(17.3)

Select Biotech	Δ % Mkt Cap	Δ \$ Mkt Cap	Δ % Mkt Cap	Δ \$ Mkt Cap
Celgene Corporation	(19.1%)	(\$15,731.8)	(26.7%)	(\$17,729.7)
Allergan plc	19.6	10,670.9	(17.9)	(11,649.7)
Gilead Sciences, Inc.	4.9	4,590.8	(8.8)	(8,653.4)
Biogen Inc.	5.7	3,837.8	(8.3)	(5,917.6)
Alnylam Pharmaceuticals, Inc.	(2.0)	(250.9)	(40.1)	(4,957.3)
Nektar Therapeutics	21.9	2,063.5	(42.3)	(4,850.4)
BeiGene, Ltd.	153.5	6,345.8	(28.1)	(2,943.4)
Incyte Corporation	(21.4)	(4,275.7)	(9.9)	(1,557.7)
Immunomedics, Inc.	92.6	2,403.1	(26.2)	(1,307.5)
Agiros Pharmaceuticals, Inc.	67.9	1,893.9	(13.4)	(629.6)
ImmunoGen, Inc.	78.9	668.4	(41.2)	(624.6)
Iovance Biotherapeutics, Inc.	191.2	1,110.9	(30.3)	(512.0)
G1 Therapeutics, Inc.	260.4	1,464.6	(24.1)	(489.4)
Audentes Therapeutics, Inc.	45.6	425.8	(26.1)	(354.3)
Mean	64.3%	\$1,086.9	(24.5%)	(\$4,441.2)
Median	33.8	1,679.2	(26.1)	(2,250.6)

Life Sciences New Issue Market

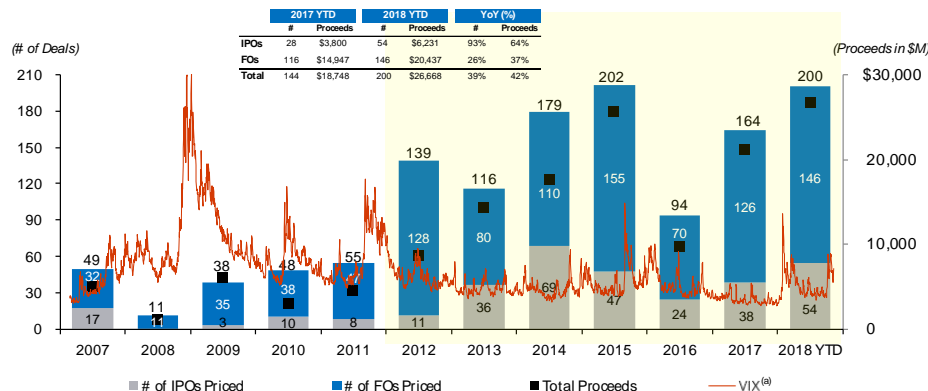
NEW ISSUANCE THEMES

- Despite intermittent market volatility, new issuance in 2018 has been robust with over \$26bn raised YTD, outpacing 2017 YTD by ~1.4x
 - IPO issuance has surpassed that of 2015 with secondary issuance near 2015's record high
- In recent weeks however, broader sentiment has shifted as pricing and aftermarket dynamics have faced challenges
 - While only 2 IPOs priced below the range through Q3 '18, so far Q4 '18 has seen 5 of 8 price well below the range
 - Follow-ons since Labor Day have seen steeper discounts and weaker aftermarket performance

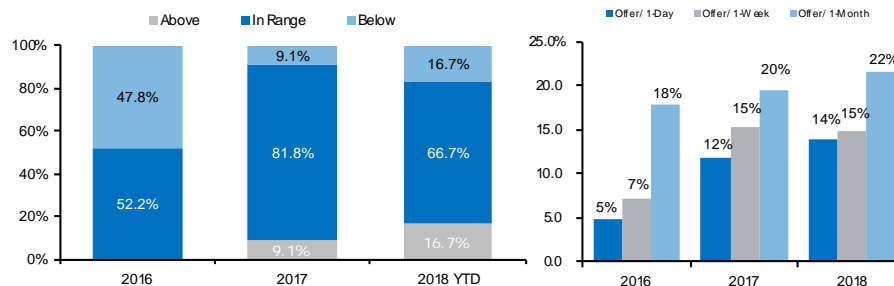
HISTORICAL OVERVIEW

	2016	2017	2018 YTD
IPOs			
# Deals	24	38	54
Average Deals / Wk	0.5	0.7	1.1
Total Proceeds (\$mm)	\$1,940	\$4,248	\$6,231
Median Proceeds	\$70	\$100	\$100
Median Market Value	\$189	\$312	\$324
% File / Offer	(16.0%)	(1.9%)	(3.3%)
Follow-Ons			
# Deals	70	127	146
Average Deals / Wk	1.3	2.4	3.1
Total Proceeds (\$mm)	\$7,713	\$17,065	\$20,437
Median Proceeds	\$84	\$87	\$86
Median Market Value	\$436	\$501	\$583
% File / Offer	(12.9%)	(10.4%)	(8.5%)

PROCEEDS RAISED IN 2018 YTD HAVE ECLIPSED THOSE OF 2017 YTD

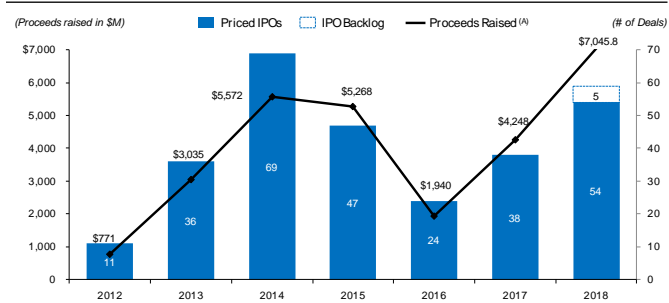


IPO PERFORMANCE OVERVIEW

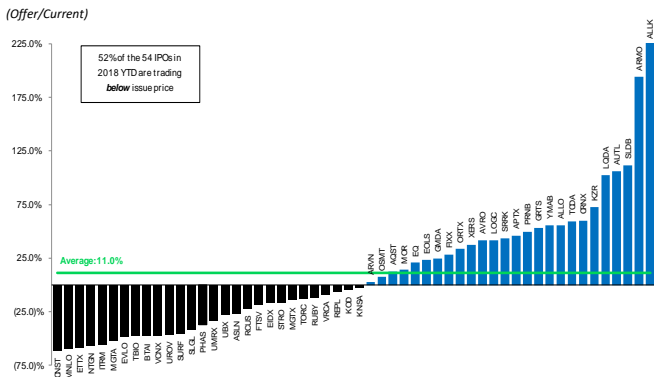


Recent Life Science IPO Dynamics

LIFE SCIENCES IPO ISSUANCE HAS SURPASSED THAT OF 2015



2018 IPO PERFORMANCE HAS BEEN MIXED



LAST 20 BIOPHARMA IPOs

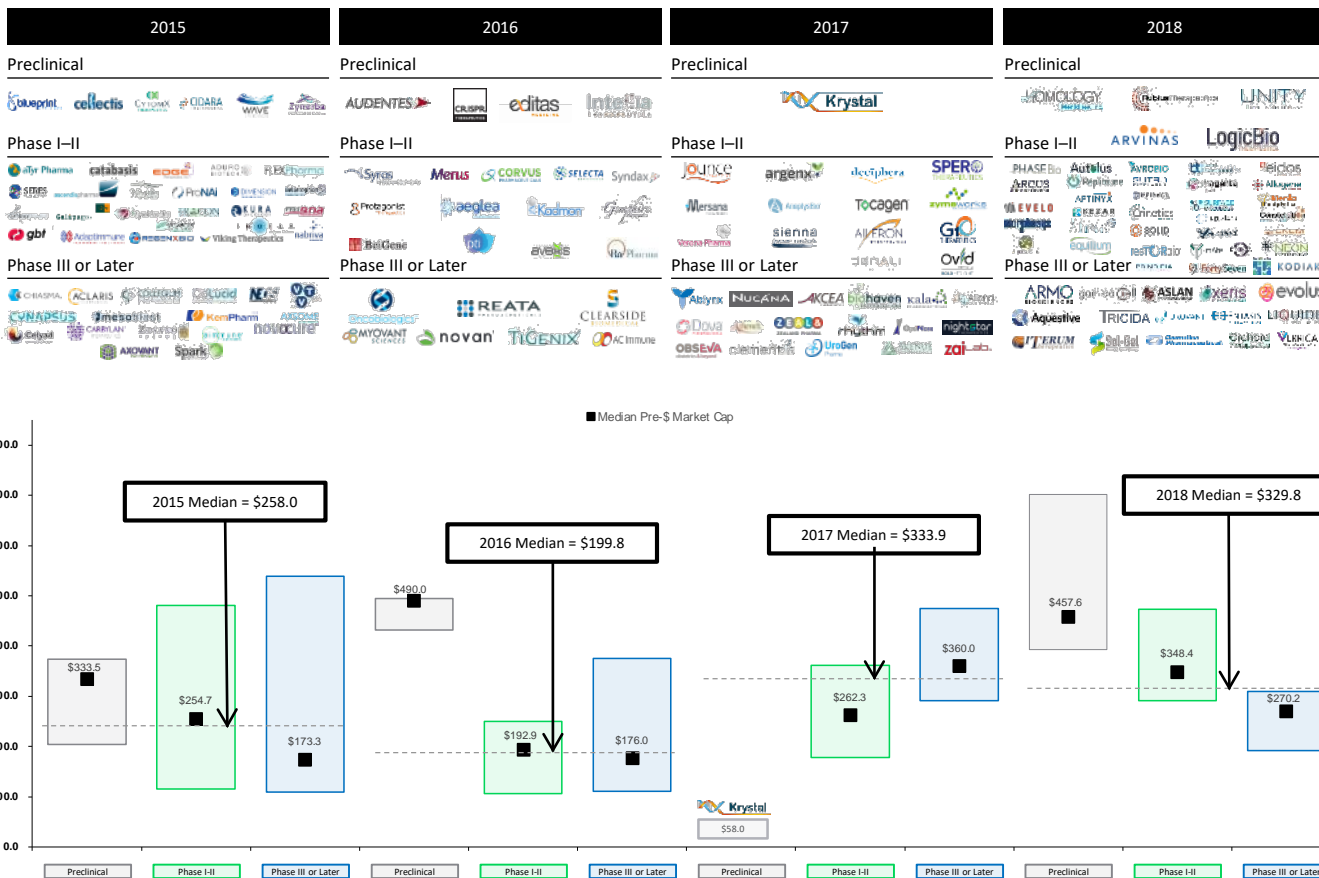
Pricing Date	Issuer	Fully Diluted		Insider Part.	Price Performance			
		Pre-S Mkt Val	Proceeds		File/ Offer	Offer/ 1-Day	Offer/ 1-Mo	Offer/ Current
10/30/18	Orchard Therapeutics	\$1,090	\$225	0.0%	(6.7)%	0.0%	—	33.6%
10/26/18	Gamida Cell	160	53	60.0	(42.9)	5.5	—	24.8
10/18/18	LogicBio Therapeutics	168	81	40.0	(23.1)	15.0	—	41.6
10/17/18	Osmotic Pharmaceuticals	300	54	0.0	(53.3)	16.4	—	7.6
10/17/18	PhaseBio Pharmaceuticals	77	46	38.5	(61.5)	0.0	—	(37.0)
10/12/18	Equillum	182	72	0.0	(6.7)	0.0	17.9%	20.7
10/10/18	Allogene Therapeutics	1,892	373	0.0	5.9	38.9	70.1	55.4
10/03/18	Kodiak Sciences	285	94	49.6	(28.6)	1.6	(2.1)	(4.4)
09/27/18	Gritstone Oncology	359	103	41.2	7.1	(5.1)	12.2	53.3
09/26/18	Arvinas	392	123	40.0	6.7	0.3	0.3	2.7
09/26/18	Sutro Biopharma	299	85	40.0	0.0	1.3	(9.7)	(16.7)
09/26/18	Urovant Sciences	303	144	25.0	(6.7)	(16.8)	(21.1)	(46.6)
09/25/18	Entasis Therapeutics	132	75	66.7	(11.8)	(28.9)	(57.5)	(58.3)
09/20/18	Y-mAbs Therapeutics	468	110	37.5	6.7	50.0	34.4	55.4
09/13/18	Principia Biopharma	310	122	34.7	6.3	92.1	47.6	49.5
08/09/18	Vaccinex	98	40	66.7	(11.1)	(5.2)	(18.9)	(47.1)
07/25/18	Liquidia Technologies	125	53	40.0	0.0	0.9	52.5	102.5
07/24/18	Aquestive Therapeutics	305	74	33.3	0.0	7.0	4.9	12.4
07/19/18	Replimune	400	111	39.8	0.0	1.1	16.3	(6.3)
07/18/18	Allakos	632	148	36.5	12.5	73.6	116.7	227.7
Last 20 IPOs								
Mean		\$399	\$109	34.5%	(10.4)%	12.4%	17.6%	23.5%
Median		301	90	39.2	(3.3)	1.2	12.2	16.6
Total		20						
Proceeds		\$2,185						

Source: ECM Analytics as of November 16, 2018. **Bold** represents Cowen led offerings.
(a): Proceeds raised include expected proceeds from IPO backlog.

Biotech IPOs Have Come Under Recent Pressure



Historical IPO Valuation Trends



Source: ECM Analytics as of November 16, 2018.

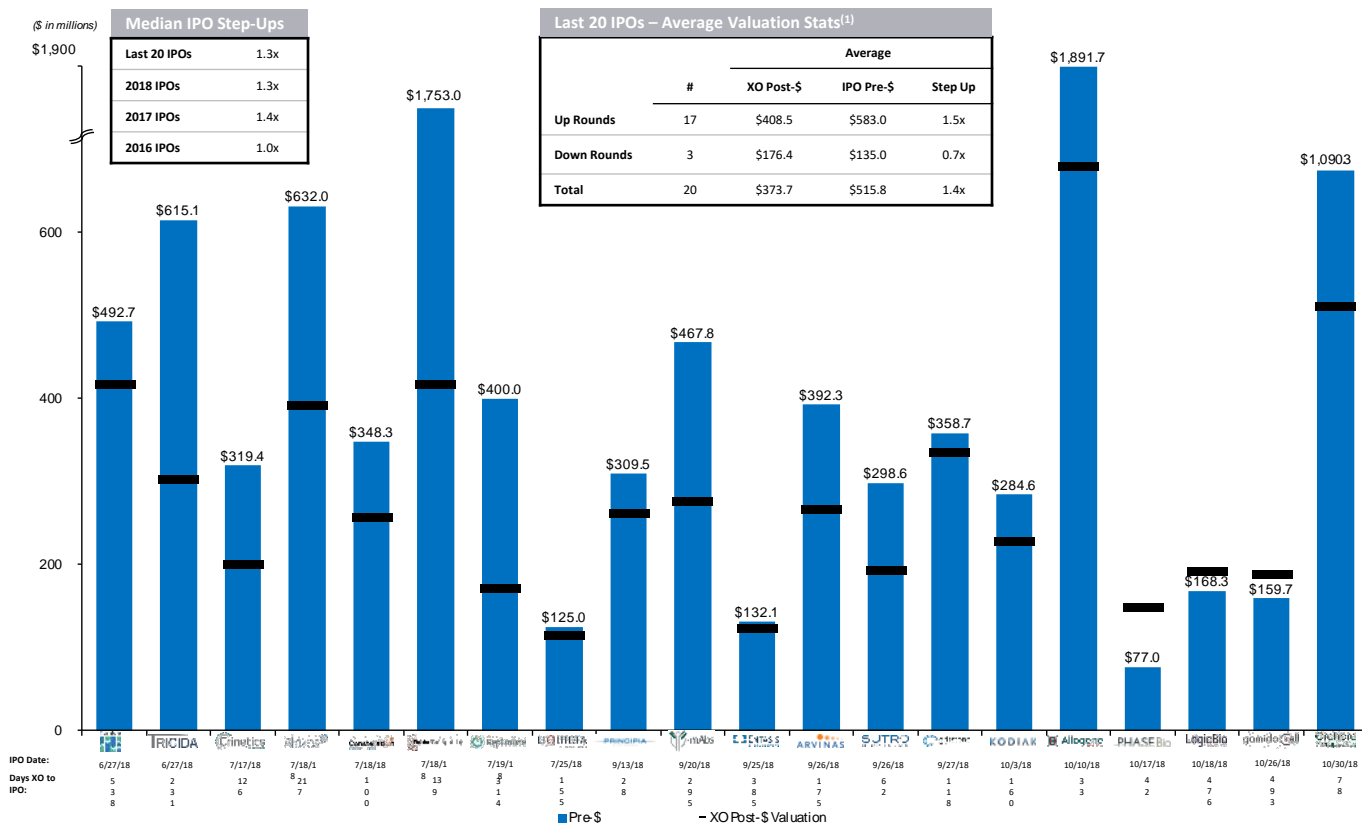
Note: Shaded bars represent the first and third quartile of each section.

The background of the slide is a blurred photograph of a laboratory. A yellow-tipped pipette is visible in the upper left, and several test tubes with orange and red caps are in the lower left. A white lab coat is partially visible on the right side. A semi-transparent dark red rectangle is centered over the image, containing the word 'Discussion' in white italicized font.

Discussion

Recent IPO Step-Ups

LAST 20 LIFE SCIENCES IPOs WITH CROSSOVER ROUNDS



Source: Capital IQ and ECM Analytics as of November 16, 2018.

(1): Includes average stats for the last 20 life sciences IPOs that completed a private financing with institutional investors.






2018 YTD Life Sciences IPO Overview

Pricing Date	Issuer	Fully Diluted Pre-S Market Cap	Deal Size	Fully Diluted Post-S Market Cap	Proceeds as a % of Post-S FD Market Cap	Cash On Hand At IPO	Stage of Lead Asset	Existing Indication On Cover	Pricing Range	% Change Offer/Current
10/30/18	Orchard Therapeutics	\$1,090.3	\$225.5	\$1,315.7	17.1%	\$196.7	Pivotal Ongoing	0.0%	Low End	33.5%
10/26/18	Gamida Cell	159.7	53.2	212.9	25.0	28.6	Phase III Ongoing	60.0	Below	24.8
10/18/18	LogicBio Therapeutics	168.3	80.5	248.8	32.4	18.3	IND Enabling	40.0	Below	41.6
10/17/18	Osmotica Pharmaceuticals	300.0	53.5	353.5	15.1	28.4	Phase III Ongoing	0.0	Below	7.6
10/17/18	PhaseBio Pharmaceuticals	77.0	46.0	123.0	37.4	76.5	Phase II Ongoing	38.5	Below	(37.0)
10/12/18	Equillum	182.0	71.6	253.6	28.2	76.5	Phase I Ready	0.0	Low End	20.7
10/10/18	Allogene Therapeutics	1,891.7	372.6	2,264.3	16.5	410.8	Phase I Ongoing	0.0	High End	55.4
10/03/18	Kodiak Sciences	284.6	94.0	378.6	24.8	17.6	Phase I Ready	49.6	Below	(4.4)
09/27/18	Gritstone Oncology	358.7	102.8	461.5	22.3	76.5	Phase I Ready	41.2	High End	53.3
09/26/18	Arvinas	392.3	123.2	515.5	23.9	3.4	IND Enabling	40.0	High End	2.7
09/25/18	Sutro Biopharma	298.6	85.0	383.6	22.2	137.4	Phase I Ongoing	40.0	Mid	(16.7)
09/25/18	Unovant Sciences	302.8	144.2	447.0	32.3	7.2	Phase III Ongoing	25.0	Low End	(46.8)
09/25/18	Enlasis Therapeutics	132.1	75.0	207.1	36.2	33.6	Phase III Ready	66.7	Below	(58.3)
09/20/18	Y-mAbs Therapeutics	467.8	110.4	578.2	19.1	70.2	Phase II Ongoing	37.5	High End	55.4
09/13/18	Principia Biopharma	309.5	122.0	431.5	28.3	18.3	Phase II Ongoing	34.7	High End	49.5
08/09/18	Vaccinex	97.7	40.0	137.7	29.0	2.9	Phase II Ongoing	66.7	Low End	(47.1)
07/25/18	Liquidia Technologies	125.0	53.2	178.2	29.9	17.6	Phase III Ongoing	40.0	Mid	102.5
07/24/18	Aquestive Therapeutics	305.4	73.9	379.3	19.5	16.5	Awaiting PDUFA	33.3	Mid	12.4
07/19/18	Replimune	400.0	111.1	511.1	21.7	61.6	Phase I Ongoing	39.8	Mid	(6.3)
07/18/18	Allakos	632.0	147.7	779.7	18.9	74.6	Phase II Ongoing	36.5	Above	227.7
07/18/18	Constellation Pharmaceuticals	348.3	60.0	408.3	14.7	71.5	Phase I Ongoing	37.5	Mid	(61.8)
07/18/18	Rubius Therapeutics	1,753.1	277.3	2,030.4	13.7	192.6	Pre-Clinical	0.0	Above	(11.5)
07/17/18	Oncofex Pharmaceuticals	319.4	117.3	436.7	26.9	73.7	Phase II Ready	49.8	High End	59.9
06/27/18	Forty Seven	400.3	129.4	529.7	24.4	78.4	Phase I Ongoing	50.0	High End	(18.8)
06/27/18	Transfate Bio	492.7	126.3	619.0	20.4	36.8	Phase I Ongoing	50.0	Mid	(47.7)
06/27/18	Triodia	615.1	255.6	870.7	29.4	75.2	Phase III Complete	25.7	Above	59.2
06/26/18	Neon Therapeutics	373.6	100.0	473.6	21.1	62.1	Phase I Ongoing	50.0	Mid	(56.6)
06/21/18	Autolux Therapeutics	526.6	172.5	699.1	24.7	120.7	Phase I Ongoing	48.0	High End	105.8
06/20/18	Aptinyx	459.0	117.8	576.8	20.4	82.4	Phase II Ongoing	50.0	High End	46.2
06/20/18	AvroBio	369.6	114.7	484.3	23.7	57.9	Phase II Ongoing	50.0	Above	41.4
06/20/18	Kezar Life Sciences	225.0	86.3	311.3	27.7	47.1	Phase I Ongoing	42.9	Mid	72.7
06/20/18	Magenta Therapeutics	429.5	100.0	529.5	18.9	41.5	Phase II Ongoing	40.0	Mid	(52.2)
06/20/18	Xeris Pharmaceuticals	240.4	98.3	338.8	29.0	58.1	Phase III Complete	40.0	Mid	37.4
06/19/18	Edos Therapeutics	513.4	122.2	635.6	19.2	25.3	Phase II Ongoing	50.0	High End	(16.9)
06/14/18	Verica Pharmaceuticals	310.0	36.3	346.3	21.8	40.0	Phase III Ongoing	0.0	Mid	(8.1)
06/07/18	MeiraGTx	348.4	75.0	423.4	17.7	32.4	Phase I Ongoing	53.3	Mid	(14.5)
05/24/18	Iterum Therapeutics	103.9	82.6	186.5	44.3	59.8	Phase III Ready	43.8	Below	(55.3)
05/23/18	Kinksa Pharmaceuticals	778.5	170.7	949.2	18.0	221.1	Phase II Ongoing	39.7	Mid	(2.9)
05/23/18	Scholar Rock	275.1	86.3	361.4	23.9	58.0	Phase I Ongoing	0.0	Mid	43.3
05/08/18	Evelo Biosciences	477.7	85.0	562.7	15.1	124.6	Phase I Ongoing	47.1	Mid	(48.2)
05/04/18	Asian Pharmaceuticals	183.0	42.2	225.1	18.7	38.6	Phase III Ongoing	0.0	—	(26.7)
05/02/18	Unity Biotechnology	702.3	85.0	787.3	10.8	67.2	Pre-Clinical	0.0	Mid	(27.8)
04/18/18	MorphoSys	2,914.8	239.0	3,153.8	7.6	92.1	Phase II Ongoing	0.0	—	14.2
04/18/18	Surface Oncology	334.4	108.0	442.4	24.4	63.3	Phase I Ongoing	29.8	High End	(45.8)
03/28/18	Unum Therapeutics	306.4	71.8	378.2	19.0	41.0	Phase I Ongoing	50.0	Low End	(32.8)
03/27/18	Homology Medicines	457.6	165.6	623.2	26.6	129.7	Pre-Clinical	50.0	High End	28.1
03/14/18	Arctas Biosciences	536.5	138.0	674.5	20.5	175.7	Phase I Ongoing	49.2	High End	(22.3)
03/08/18	Beigot Therapeutics	137.2	60.0	197.2	30.4	0.9	Phase I Ready	0.0	Low End	(47.6)
02/07/18	Evulus	227.1	60.6	287.7	21.1	0.0	Pending Approval	0.0	Low End	23.2
01/31/18	Sol-Gel Technologies	149.1	86.3	235.4	36.6	12.5	Phase III Ready	41.7	Mid	(41.7)
01/25/18	ARMO BioSciences	398.1	147.2	545.3	27.0	66.5	Phase III Ongoing	40.0	Above	194.0
01/25/18	resTORbio	325.2	98.0	423.2	23.2	58.9	Phase II Ongoing	41.2	Mid	(12.3)
01/25/18	Solid Biosciences	421.4	143.6	565.0	25.4	84.6	Phase I/II Ongoing	39.9	Low End	111.4
01/24/18	Menlo Therapeutics	284.2	136.9	421.1	32.5	73.5	Phase II Ongoing	47.1	Above	(59.0)
All (54 Deals)										
Mean		\$457.6	\$115.4	\$573.0	23.7%	\$70.8		34.6%		11.9%
Median		\$41.3	\$10.0	\$439.5	23.4	60.7		40.0		(3.7)

Source: ECM Analytics as of November 16, 2018. IPOs only include sub \$5 billion market cap issuers. Includes IPOs greater than \$30 million.

Life Sciences IPO Backlog

PUBLIC LIFE SCIENCES IPO FILINGS

Filing Date	# Days On File	In Market	Company	Proceeds Filed (\$mm)	Bookrunners	Phase of Lead Asset	Pre-IPO Cash (\$mm)	Fully Diluted Pre-Deal Market Valuation (\$mm)
11/13/18	3			\$100.0	JEFF; LEER; EVR	IND Enabling	\$20.6	—
11/9/18	7			500.0	MS; GS; JPM BOAML; BAR; PJ; BRYG	Phase 2 Ongoing	1,234.9	—
10/19/18	28	<i>Postponed</i>		75.0	BOAML; LEER; EVR	Pivotal Ongoing	42.1	\$279.2
9/28/18	49			65.0	CITI; RBC; NOM	Pivotal Ongoing	0.9	—
9/28/18	49			75.0	GS; CITI; COWEN	Phase II Ongoing	189.2	—

# of IPOs Filed:	5
Total Proceeds Filed (\$mm):	\$815.0

Note: As of November 16, 2018. IPOs only include sub \$5 billion market cap issuers with proceeds greater than \$30 million.

Bold denotes Cowen led transaction.



Questions?

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