

N A U T I L U S

LEADERSHIP PROGRAM

A G E N D A

8 : 0 0 A M

WELCOME/KICK OFF

8 : 0 5 A M

COWEN GROUP

“STATE OF THE STATE”

(JEFF SOLOMON & JASON FENTON)

8 : 3 0 A M

CEO Q&A

(MODERATED BY JASON RHODES)

SOME GROUND RULES BEFORE WE DIVE IN...

MUTE YOUR MICROPHONES IF NOT SPEAKING...

USE YOUR VIDEO (IF COMFORTABLE), IT'S GREAT TO SEE YOU ALL

FOR QUESTIONS...

- Use the chat function as we go
- Raise your hand during the Q&A section and we will call on you
- Remember to unmute for questions!

WILL FOLLOW UP WITH THESE SLIDES FOLLOWING THE SESSION



TODAY'S SPECIAL GUESTS

COWEN



JEFFREY M. SOLOMON

Chief Executive Officer, Cowen Inc



JASON FENTON

Managing Director and Head, Health Care - Capital Markets



Discussion Materials

MAY 2020

Key Attributes of Successful Biotech Companies

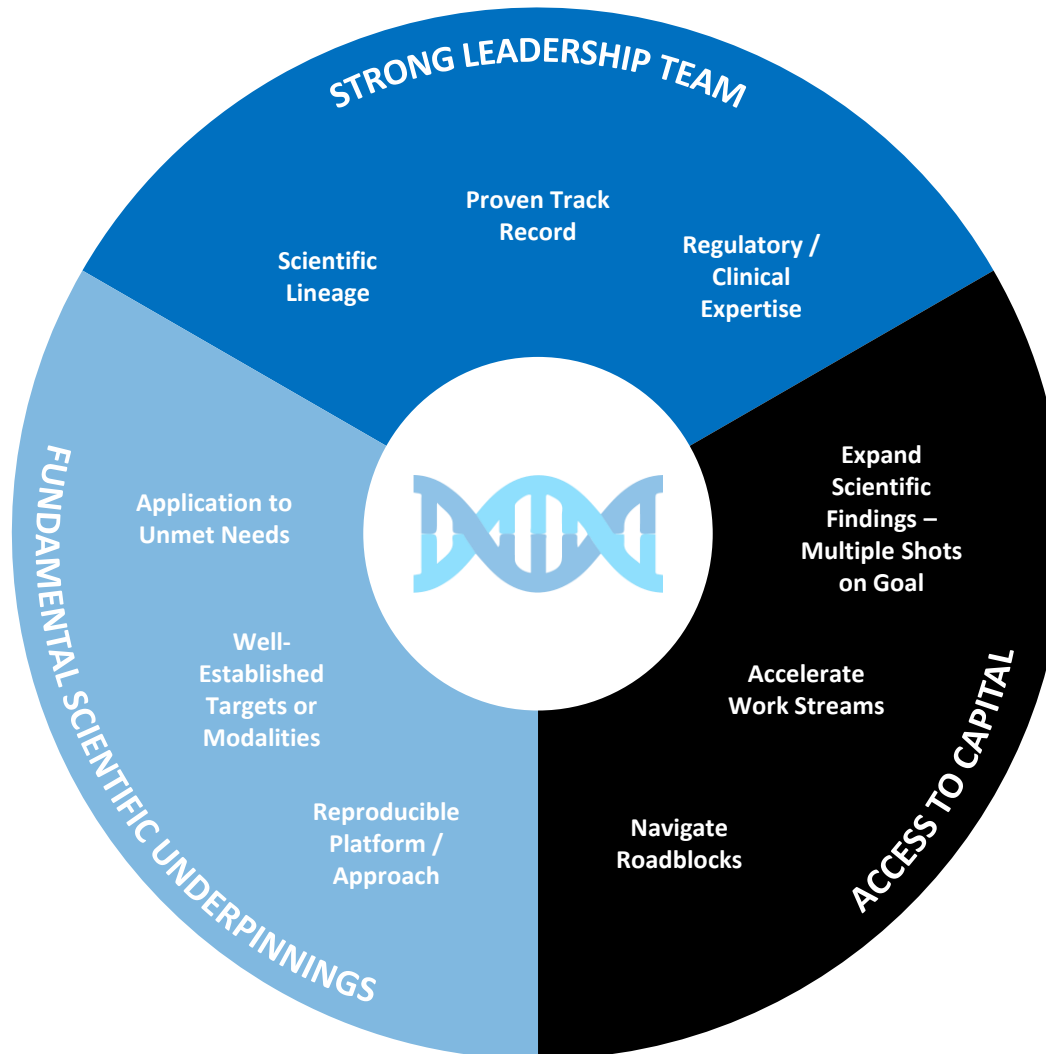


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1. MARKET UPDATE

Health Care Market Snapshot

BROADER MARKETS

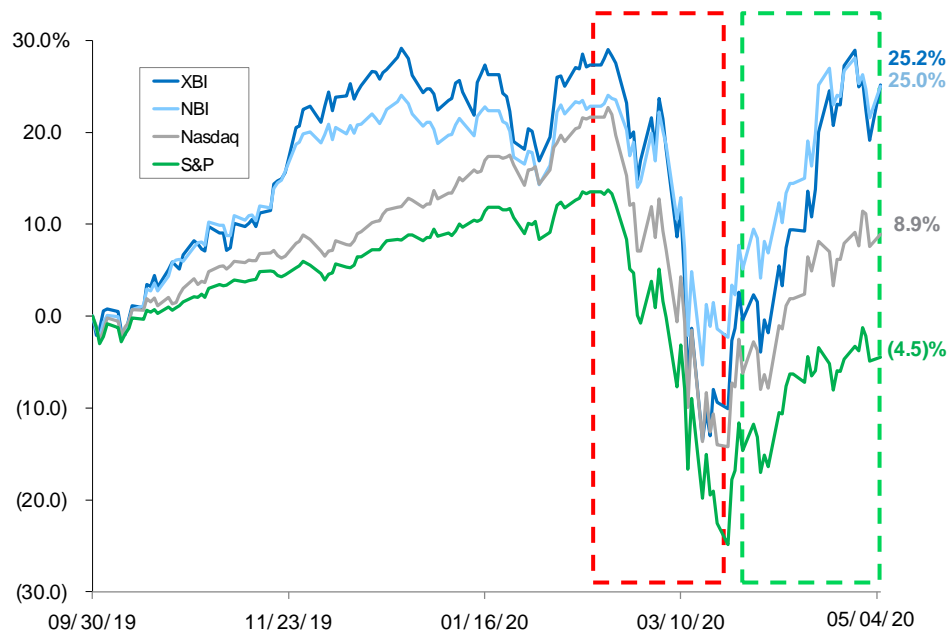
- **U.S. stocks finished April with big gains** even as economic data continues to highlight the economic impact of the COVID-19 pandemic
 - Stocks posted **their largest percentage gains since 1987**, with the **S&P 500 and Dow** closing the month **up 14% and 11%**, respectively
- The **VIX remains up ~161% in 2020 YTD**
- Q1 earnings season continued last week; ~55% of the S&P 500 constituents had reported as of Friday, with 157 more due to report this week
 - The **S&P 500 and Dow both fell ~3% midday Friday** after large technology companies including Amazon and Apple reported mixed earnings
- **Headlines continue to be dominated by the COVID-19 pandemic**, despite some positive signs that the virus is peaking and leveling off in some of the hardest-hit parts of the country and world
 - The **FDA authorized emergency use of Gilead's remdesivir in COVID-19 patients** on Friday

BIOTECH MARKETS

- Relative to other sectors, **healthcare has been the best performing sector in the S&P 500 2020 YTD**
 - The **XBI and NBI are up 15% and 23% since Q1**, respectively, having recovered all of their COVID-related losses
 - **R&D for a cure or vaccine to help end the pandemic** combined with a decline in talk of healthcare reform have **helped boost the sector**
- **Fund flows in healthcare** have been **notably strong**, exceeding every other sector in April and posting **~\$1.7bn in net inflows** last week, bringing the past two week's total to \$5.4bn
- **M&A activity has accelerated** with **Merarini Group acquiring Stemline Therapeutics** on May 4th for ~\$677mm and **Alexion acquiring Portola** for \$18/share on May 5th
- Although new issuance has slowed, **24 biotech offerings have priced during the COVID-19 pandemic**
 - **Four IPOs priced in April**: a **\$190mm IPO** for Zentalis, a **\$110mm IPO** for Keros, a **\$138mm IPO** for Oric and a **\$64mm IPO** for Lyra
 - All offerings priced at the **high end of the range** and are **trading up 61%** on average
 - Conducting **virtual roadshows**, all were on the road for **5 days or less**, marking a change from the traditional 8 day roadshow structure
 - **18 follow-ons have priced** for ~\$2.1bn in total proceeds, **6 of which priced last week**
 - 2020 YTD follow-on issuance remains up 24% from the same period in 2019

MARKETS HAVE COME UNDER RECENT PRESSURE

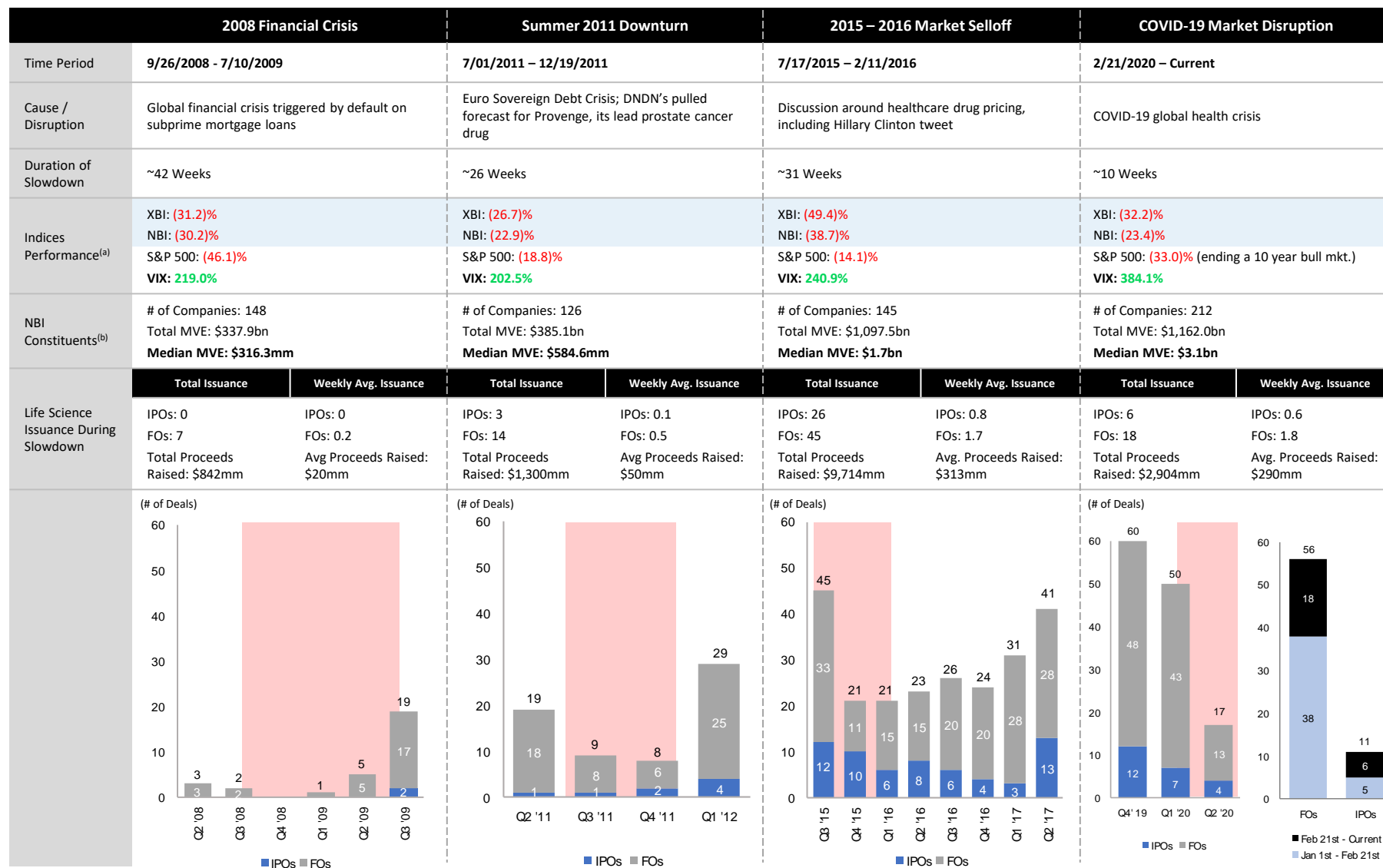
Indices		Price Performance (%)			
		1-Week	Since Q1 2020	2020 YTD	Since Q4 2019
Broader Market Indices					
S&P 500	2,842.7	(1.2%)	10.0%	(12.0%)	(4.5%)
Nasdaq	8,710.7	(0.2%)	13.1%	(2.9%)	8.9%
VIX	36.0	8.1%	(32.8)%	161.0%	121.5%
Biotech Market Indices					
NBI	3,909.4	(2.4%)	15.2%	3.2%	25.0%
XBI	95.4	(2.9%)	23.2%	0.3%	25.2%



Source: Price performance calculated with Bloomberg and Capital IQ as of May 4, 2020.

Comparison of Biotech Market Disruptions

The current market environment is not necessarily untrodden territory for a volatile sector



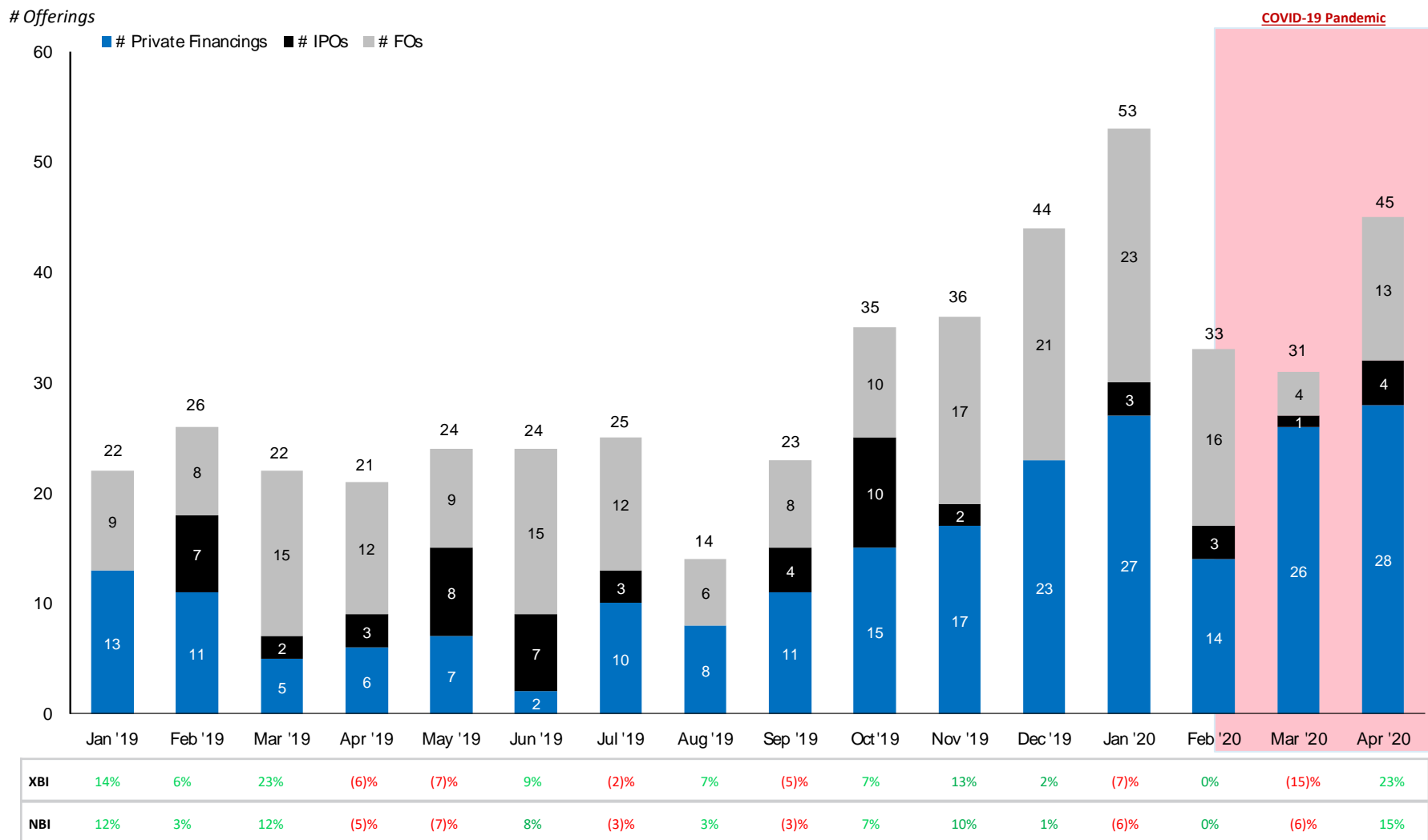
Source: ECM Analytics and CapIQ as of May 4, 2020. (a): Represents peak to trough performance over each time period.

(b): Represents NBI constituents at the start of each period.

Monthly Life Sciences Issuance Since 2019

Despite volatile market conditions, life sciences financing activity in Q1 2020 reached record levels

LIFE SCIENCES ISSUANCE BY MONTH



Source: ECM Analytics and Capital IQ as of May 4, 2020. Includes all life sciences offerings since 2019. Excludes IPOs with proceeds less than \$30 million and follow-ons with proceeds less than \$20 million.

Life Sciences Follow-Ons During the COVID-19 Pandemic

Pricing Date	Company	Pre-Deal Mkt Catalyst	Deal Type	Proceeds (\$mm)	Pre-Deal Mkt Val (\$mm)	Proceeds / Market Value	30-Day Pre-Deal Appreciation	File/ Offer	Last Trade/ Offer	Offer /	
										1-day	Current
04/30/20	Fennec Pharmaceuticals		OMPO	\$30.0	\$143.8	20.9%	33.1%	(13.6)%	(13.6)%	0.0%	4.2%
04/30/20	Syndax Pharmaceuticals	✓	OMPO	100.0	565.5	17.7	92.0	(3.7)	(3.7)	0.0	3.2
04/28/20	Aeglea Biotherapeutics		OMPO	138.0	161.4	85.5	19.1	(14.4)	(14.4)	49.6	68.4
04/28/20	Avadel Pharmaceuticals	✓	FO	125.0	440.9	28.4	40.4	(3.6)	(8.5)	(3.3)	(15.3)
04/28/20	Immunomedics	✓	FO	483.0	6,172.3	7.8	110.2	0.6	(1.9)	9.2	11.2
04/28/20	NeuBase Therapeutics		OMPO	36.2	139.5	25.9	14.7	(26.6)	(26.6)	26.7	34.7
04/22/20	VBI Vaccines		OMPO	57.5	278.1	20.7	78.3	(29.5)	(29.5)	0.0	11.8
04/21/20	Actinium Pharmaceuticals		OMPO	31.6	41.2	76.6	24.4	(37.5)	(37.5)	16.7	21.6
04/16/20	Arcturus Therapeutics	✓	OMPO	80.5	272.5	29.5	40.4	(5.6)	(5.6)	0.0	129.8
04/16/20	Calithera Biosciences		OMPO	35.9	498.6	7.2	108.8	(20.4)	(20.4)	0.2	12.2
04/15/20	Athersys	✓	OMPO	57.6	529.7	10.9	118.3	(27.4)	(27.4)	1.3	16.9
04/15/20	Orinectics Pharmaceuticals		OMPO	115.1	360.1	32.0	28.1	(5.5)	(5.5)	10.6	21.6
04/14/20	Immunovant Sciences	✓	FO	139.4	877.9	15.9	45.4	(6.7)	(6.8)	18.3	31.1
03/12/20	Compugen	✓	OMPO	79.3	803.5	9.9	32.2	(23.9)	(23.9)	(5.4)	66.0
03/10/20	Kala Pharmaceuticals	✓	OMPO	134.0	304.3	44.0	23.4	0.0	0.0	(3.3)	34.3
03/03/20	Karyopharm Therapeutics	✓	FO	172.5	1,613.0	10.7	57.8	(13.4)	(2.8)	10.8	(13.8)
03/03/20	Zogenix		OMPO	230.3	1,128.2	20.4	(50.8)	(5.7)	(5.7)	16.4	12.6
02/27/20	Oramed Pharmaceuticals	✓	OMPO	21.0	83.6	25.1	(9.3)	(14.9)	(14.9)	(1.3)	(24.5)
All (18 deals)											
Average:				\$114.8	\$800.8	27.2%	44.8%	(14.0)%	(13.8)%	8.1%	23.7%
Median:				90.3	400.5	20.8	36.8	(13.5)	(11.0)	0.7	14.7
OMPOs (14 deals)											
Average:				\$81.9	\$379.3	30.4%	39.5%	(16.3)%	(16.3)%	8.0%	29.5%
Median:				68.5	291.2	23.0	30.1	(14.7)	(14.7)	0.1	19.2
Follow-Ons (4 deals)											
Average:				\$230.0	\$2,276.0	15.7%	63.4%	(5.8)%	(5.0)%	8.8%	3.3%
Median:				156.0	1,245.4	13.3	51.6	(5.1)	(4.8)	10.0	(1.3)
Deals with Catalyst (10 deals)											
Average:				\$139.2	\$1,166.3	20.0%	55.1%	(9.9)%	(9.5)%	2.6%	23.9%
Median:				112.5	547.6	16.8	42.9	(6.1)	(6.2)	0.0	14.0
Deals without Catalyst (8 deals)											
Average:				\$84.3	\$343.9	36.1%	32.0%	(19.1)%	(19.1)%	15.0%	23.4%
Median:				46.9	219.7	23.4	26.2	(17.4)	(17.4)	13.5	17.1

Source: ECM Analytics as of May 4, 2020. Includes all life sciences follow-ons since February 21, 2020 with proceeds raised greater than \$20 million.

Note: Excludes bought and warrant deals. **Bold** represents Cowen led offerings.

2020 YTD Life Sciences IPOs

Pricing Date	Issuer	Fully Diluted Pre-\$ Market Cap	Deal Size	Fully Diluted Post-\$ Market Cap	Proceeds as a % of Post-\$ FD Market Cap	Cash On Hand At IPO	Therapeutic Area of Lead Candidate	Stage of Lead Candidate	Existing Indication On Cover	Pricing Range	% Change Offer / Current
04/30/20	Lyra Therapeutics	\$150.3	\$64.4	\$214.7	30.0%	\$39.8	Otolaryngology	Phase II Ongoing	0.0%	High End	11.1%
04/23/20	ORIC Pharmaceuticals	373.2	138.0	511.2	27.0	89.2	Oncology	Phase I Ongoing	0.0	High End	73.1
04/07/20	Keros Therapeutics	229.2	110.4	339.6	32.5	62.8	Hematology	Phase II Ready	0.0	High End	81.4
04/02/20	Zentalis Pharmaceuticals	454.0	190.0	644.0	29.5	67.2	Oncology	Phase I / II Ongoing	0.0	High End	77.4
03/11/20	Imara	211.2	86.5	297.7	29.1	46.1	Hematology	Phase II Ongoing	0.0	Low End	14.0
02/27/20	Passage Bio	624.0	248.4	872.4	28.5	158.9	Orphan / CNS	Pre-Clinical	0.0	High End	3.1
02/12/20	Revolution Medicines	795.7	273.7	1,069.4	25.6	136.3	Oncology	Phase I / II Ongoing	0.0	Above	72.4
02/05/20	Beam Therapeutics	725.8	207.0	932.8	22.2	201.7	Oncology / Hematology	Pre-Clinical	0.0	High End	(7.3)
01/30/20	Arcutis Biotherapeutics	497.7	183.3	681.0	26.9	119.5	Dermatology	Phase III Ongoing	40.0	High End	51.0
01/29/20	Black Diamond Therapeutics	471.0	231.3	702.3	32.9	163.7	Oncology	Phase I / II Ready	0.0	Above	95.9
01/16/20	I-Mab	805.7	114.5	920.1	12.4	171.3	Oncology	Phase III Ongoing	48.0	Mid	16.3
2020 YTD (11 Deals)											
Mean		\$485.3	\$168.0	\$653.2	27.0%	\$114.2			8.0%		44.4%
Median		471.0	183.3	681.0	28.5	119.5			0.0		51.0

COVID-19 Pandemic^(a)Source: ECM Analytics as of May 4, 2020. Includes the all 2020 YTD life sciences IPOs greater than \$30 million. **Bold** represents Cowen led offerings.

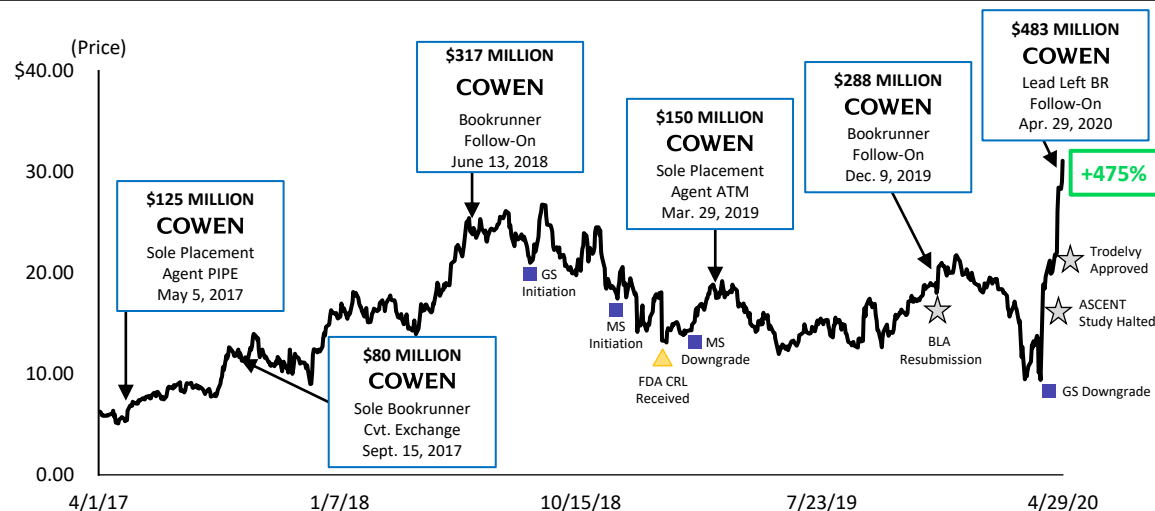
(a): Includes all IPOs that have priced since February 21, 2020.

Cowen's Committed Partnership with Immunomedics

HISTORICAL OVERVIEW

- Cowen served as lead left bookrunner on Immunomedics' **\$483 million** follow-on offering in April 2020
 - The transaction was the **largest** life sciences follow-on offering in the COVID-19 era and the **2nd largest offering of 2020**
- The financing came on the heels of **FDA approval of Immunomedics' Trodelvy** for treatment of mTNBC and the Phase 3 ASCENT study being **stopped early for compelling evidence of efficacy**
- At a critical time for the company during unprecedented market conditions, **Immunomedics entrusted Cowen** to lead its mission critical financing
 - The offering was **upsized 20%** from launch based on significant demand from new and existing investors
 - Priced at a **(2)% discount**, the offering was executed at a **premium to the prior day's close**
 - Immunomedics shares traded up 9%** on the first day of trading post transaction and the green shoe was exercised in full increasing total proceeds to **\$483 million**
- With a partnership dating back several years, this was the fourth equity offering for Immunomedics in which Cowen served as a bookrunner
- In May 2017, Cowen raised \$125mm for Immunomedics as the sole agent on a convertible PIPE offering
 - The convertible preferred structure allowed the company to maximize proceeds raised despite having no authorized shares available
- Cowen is the **only investment bank to consistently serve as a bookrunner for Immunomedics** since our first transaction for the company in 2017

COWEN MAKES A LONG-TERM COMMITMENT AND FOLLOWS THROUGH



TRANSACTION HIGHLIGHTS



\$125 MILLION ★ Convertible Pref. PIPE Sole Placement Agent: COWEN May 2017	\$317 MILLION Follow-On Bookrunners: Morgan Stanley COWEN Jefferies June 2018	\$288 MILLION Follow-On Bookrunners: Goldman Sachs Bank of America Merrill Lynch COWEN Jefferies December 2019	\$483 MILLION ★ Follow-On Bookrunners: COWEN Bank of America Merrill Lynch Jefferies PIPER Sandler April 2020
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Pre-\$ Market Value	\$574mm	\$4,087mm	\$3,456mm	\$6,172mm
Proceeds as % of Mkt. Value	21.8%	7.8%	8.3%	7.8%
File / Offer	0.0%	0.7%	(7.9)%	0.6%
Offer / 1-Day	17.6%	1.4%	5.7%	9.2%
Offer / Current	475.2%	29.7%	77.8%	9.2%

Source: Capital IQ as of April 29, 2020. ★notes Cowen-led offering.

Biotech & Pharma: Private Debt Market Update

Active debt market for issuers spanning all stages of clinical development and market capitalization

38+

LTM PRIVATE DEBT DEALS COMPLETED

EXPANDING LENDER UNIVERSE

45+ LENDERS ACTIVELY SEEKING OPPORTUNITIES; NEW ENTRANTS INCLUDE TOP TIER DIRECT LENDERS

\$3.1B+

LTM PRIVATE DEBT CAPITAL COMMITTED

COMPETITION DRIVING TERMS

✓ LOWER PRICING ✓ INCREASED COVENANT FLEXIBILITY ✓ LARGER FACILITIES ✓ FLEXIBLE PREPAYMENT TERMS

+6%

AVERAGE 1 WEEK PRICE CHANGE POST-ISSUE OVER LTM

POSITIVE MARKET SENTIMENT

MEAN STOCK PRICE INCREASED 6% ONE WEEK POST-ANNOUNCEMENT FOR DEALS COMPLETED OVER THE LTM

CUSTOMIZED SOLUTIONS

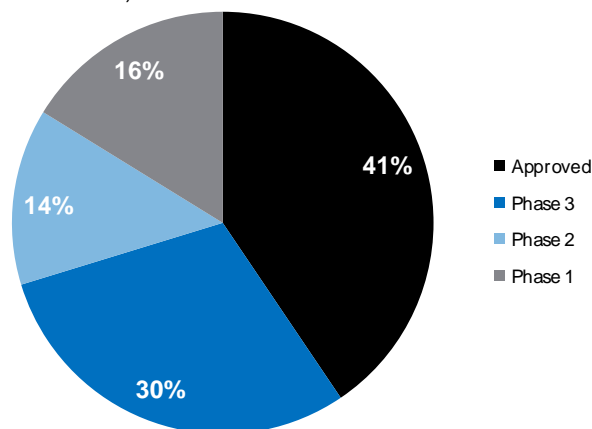
LTM COMPLETED TRANSACTIONS RANGE FROM PHASE 1 TO POST APPROVAL, MARKET CAPS \$65MM TO \$7.5B

LTM ISSUANCE TRENDS

Stage of Lead Asset at Issue:	Pre-Approval	Post-Approval
Committed Capital Raised (\$ billions)	\$1.2	\$1.9
Deal Count	22	16
Average Deal Size (\$ millions)	\$55	\$117
Average Initial Funding as a % of Deal Size	48%	67%
Average Market Cap at Issue (\$ millions)	\$530	\$1,176
Average Initial Funding as a % of Market Cap at Issue	10%	16%
Average Deal Size as a % of Market Cap at Issue	20%	24%
% of Deals Without a Non-Call Provision	79%	64%
Average 1 Day Stock Price Reaction	4%	4%
Average 7 Day Stock Price Reaction	8%	5%

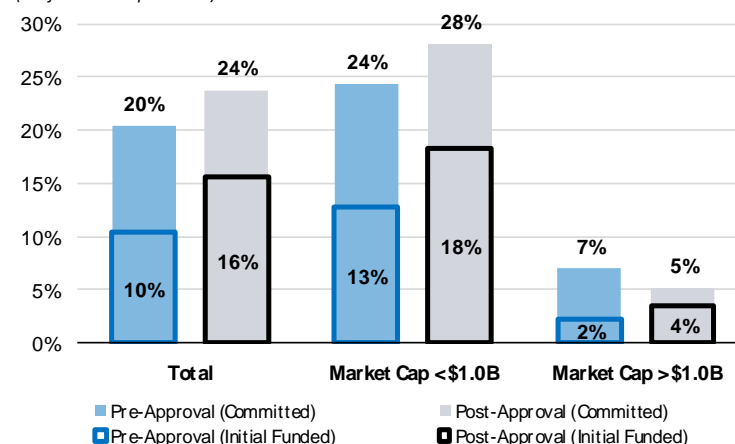
LTM DEALS BY STAGE OF LEAD ASSET AT ISSUE

(% of LTM Deal Count)



LTM COMMITTED & INITIALLY FUNDED CAPITAL

(% of Market Cap at Issue)



Source: Cowen DCM Analytics as of May 2020. Includes only private loans to publicly listed issuers with market capitalization at issue between \$50.0 million - \$7.5 billion. Excludes deals with total commitments less than \$20.0 million. Committed capital excludes revolving credit facilities

Theravance Biopharma — \$400.0 Million Fixed Rate Notes

Cowen acted as Sole Placement Agent and Financial Advisor to Theravance Biopharma for the \$400.0 million Royalty-Backed Fixed Rate Term Notes that supported the refinancing and upsizing of its existing debt

SUMMARY OUTCOME

Cowen delivered unbiased advice across its platform to support Theravance with a holistic capital markets strategy

\$400.0 MILLION

**Theravance
Biopharma** 

Non-Recourse Royalty-Backed Notes

Sole Placement Agent &
Financial Advisor

COWEN

February 2020

SUMMARY OF FINAL TERMS

Amount:	\$400.0 million
Rate:	9.50%
Prepayment:	NC-2, 105, 103, 101

CROSS-PRODUCT TRANSACTIONS

\$148.5 MILLION

**Theravance
Biopharma** 

Follow-On
Equity Offering

Joint Bookrunner

COWEN

February 2020

\$150.0 MILLION

**Theravance
Biopharma** 

At The Market Offering

Sole Agent

COWEN

December 2019

COMPANY & SITUATION OVERVIEW

- Theravance Biopharma, Inc. ("Theravance" or "the Company") is a diversified biopharmaceutical company primarily focused on the discovery, development, and commercialization of organ-selective medicines. The Company's focus areas for research are inflammation and immunology
- In 2014, Theravance completed a spin-off from Innoviva (NASDAQ:INVA) resulting in the divestiture of the royalty product portfolio from pipeline candidates
- Jointly owned TRC LLC was established to collect and distribute royalties from the portfolio
 - While Innoviva was named manager of the LLC, Theravance retained significant economic interest in TRC LLC, including 85% of distributions for TRELEGY ELLIPTA
- In November 2018, Theravance (via a subsidiary Issuer) announced the placement of \$250.0 million of non-recourse term notes
 - Notes primarily secured by Theravance's interest in 75% of the royalties from TRELEGY ELLIPTA, at the time a recently approved drug for the treatment of COPD in very early stages of commercialization
- In the beginning of 2019, Innoviva began withholding distributions from TRC LLC to fund development and commercialization initiatives for TRELEGY, which resulted in Theravance initiating arbitration proceedings
- In September 2019, arbitrator ruled that Innoviva was not in breach by withholding royalties but the initiatives must be put to GSK as the sole owner of TRELEGY commercial rights
 - GSK rejected all initiatives in January 2020

TRANSACTION OVERVIEW & KEY TAKEAWAYS

- As TRELEGY ELLIPTA completed its second year of sales, Theravance sought to capitalize on the drug's tremendous commercial success through a refinancing and upsizing of its existing royalty-backed notes
- Cowen worked with the Company to create a model supported by 3rd party data sources and custom analytics providers
 - Investors expressed a willingness to underwrite significantly higher projections than Wall Street estimates based on the Company's presentation
- Cowen approached life sciences focused credit funds, pension funds, generalist credit lenders, and royalty providers
 - Transaction marketing was complicated by the legal dispute with Innoviva
 - Focused on identifying a concentrated lender base comfortable with structural complexity and additional flexibility sought by the Company
 - Delivered competitive solutions for a senior / subordinate and all senior structures
- Cowen delivered competitive solutions for a hybrid (senior / subordinate) and senior structures, ultimately resulting in an oversubscribed deal with:
 - ✓ **An additional \$150.0 million of capital**
 - ✓ **Ability to PIK for five years**
 - ✓ **Unlimited capital contributions**
 - ✓ **Covenant flexibility**



2. LIFE SCIENCES M&A UPDATE

Biopharma Strategic Outlook

Major Strategic Themes

Consolidators still open for business – pharma is well capitalized and aggressively updating “shopping lists”

Strong interest in differentiated technology that can be best in class or accelerated to “first-in-class”

Decline in stock prices, while fleeting, whet consolidators’ appetites, but we have yet to see a rash of hostile bids / raids during COVID and the focus remains on science not value

Defense measures (e.g., poison pills), and strategic alternatives, particularly for those with an outsized financing need

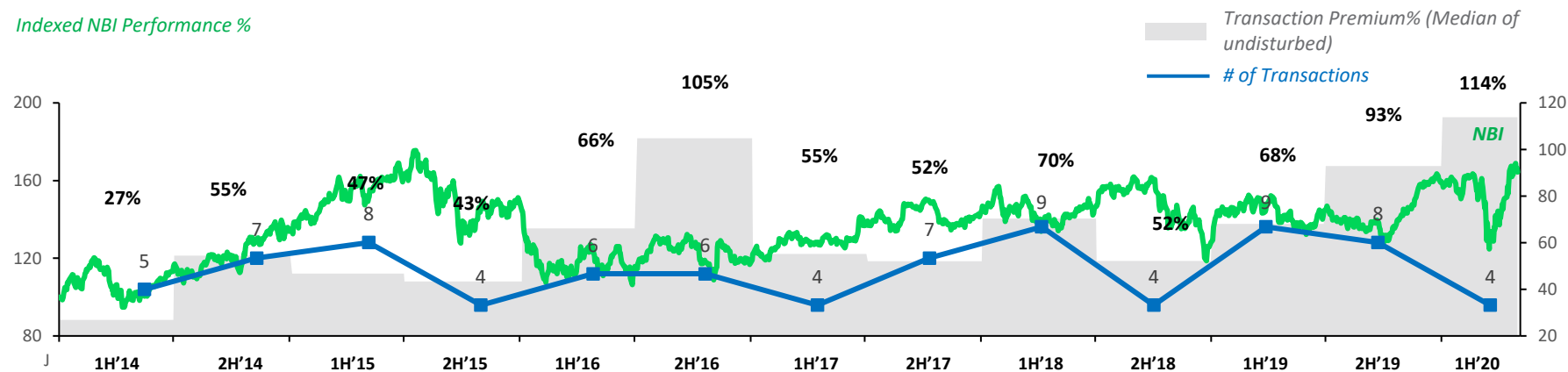
Private companies are increasingly pursuing the optionality of a dual track IPO/M&A process

We expect to see continued growth in broad strategic partnerships – consolidators looking to “risk-adjust” and biotech looking to maintain optionality while securing long-term permanent financing

2014 -2020 YTD: NBI V.S. PURCHASE PREMIA (UNDISTURBED, MEDIAN OF HALF-YEAR TRANSACTIONS)

HISTORICALLY, MARKET VOLATILITY GETS OFFSET BY M&A TAKEOUT^(A) PREMIUMS

Indexed NBI Performance %



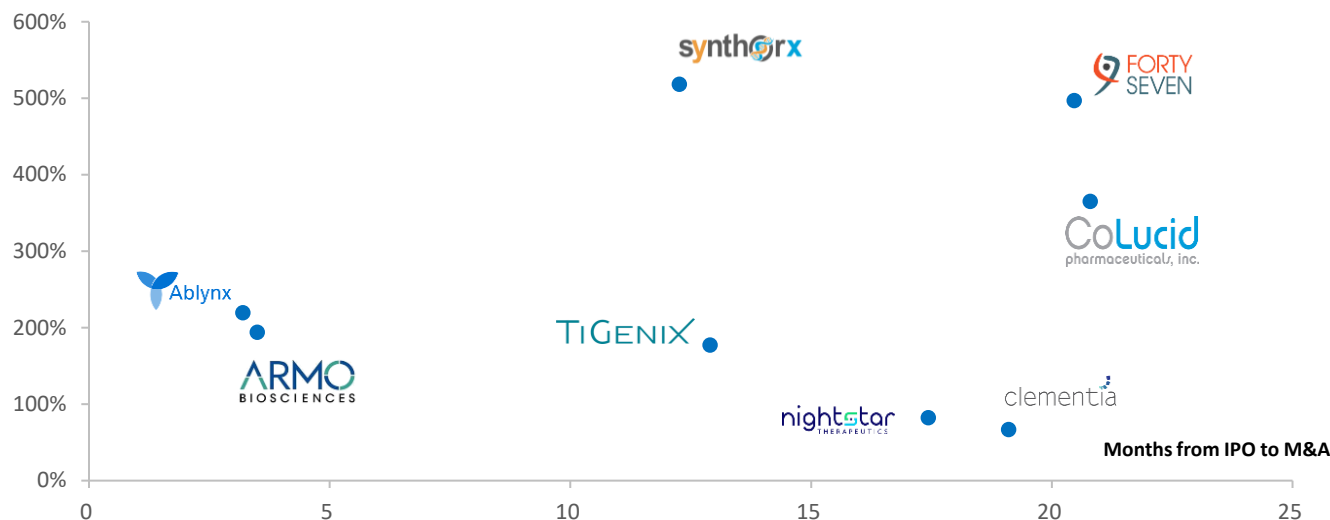
Source: Capital IQ and public filings as of May 5, 2020.

(a) Transactions > \$150M in equity value, with target being publicly traded prior to the acquisition.

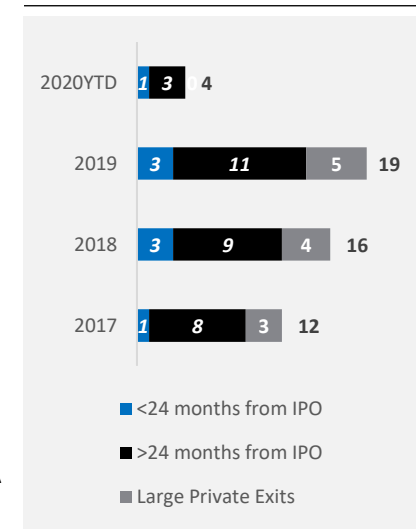
Selected Companies Achieving Fast Path from IPO to Acquisition

In 2018-19, more companies received strategic outcomes in a short term post IPO (<24 months)

Return for IPO Investors



of Biotech^(a) Transactions



COMPANIES ACQUIRED WITHIN 24 MONTHS SINCE IPO^(b), 2017 – 2020 YTD

Company	Acquiror	M&A Announce Date	Months From IPO to M&A	Sale Transaction Equity Value	IPO Size (\$M)	IPO Step-up	Return for IPO Investors	Return for Pre-IPO Investors	Therapeutic Area of Lead Candidate	Stage of Lead Asset At IPO	Stage of Lead Asset At Sale
Forty Seven	Gilead	03/02/20	20	\$4,900	\$129	1.62x	497%	966%	Oncology	Phase I Ongoing	Phase Ib (Expanded)
Synthorx	Sanofi	12/09/19	12	2,350	151	2.10x	518%	1300%	Oncology	IND Enabling	Phase I/II Ongoing
NightStar	Biogen	03/04/19	17	800	86	1.76x	82%	321%	Ophthalmology	Phase III Ready	Phase III Ongoing
Clementia	Ipsen	02/25/19	19	1,040 ^(c)	138	1.46x	67% ^(c)	243% ^(c)	Orphan	Phase III Ready	Phase III Ongoing
ARMO	Eli Lilly	05/10/18	4	1,600	147	1.38x	194%	405%	Oncology	Phase III Ongoing	Phase III Ongoing
Ablynx	Sanofi	01/29/18	3	4,830	230	NA	220%	NM	Various	Phase III Complete	BLA Ready
TiGenix	Takeda	01/05/18	13	630	36	NA	177%	NM	Autoimmune	EU Phase III Completed	EU Pre-Approval
CoLucid	Eli Lilly	01/18/17	21	960	55	1.17	365%	544%	CNS	Phase III	Phase III Completed

Source: Company press release and SEC filings, Dealogic.

(a) Public deals include biotech companies listed at U.S. stock exchanges; Excludes large-cap consolidations. Private exits include VC-backed biotech companies sale transactions.

(b) Includes U.S. IPO of companies with EU listings.

(c) CVR not included.

Selected Private Companies Choosing M&A Exit Over IPO

2019 has seen a surge in early stage premier private takeouts

Aggregate Upfront Consideration (\$M) of Premier(a) Preclinical / Phase I Private Companies M&A Transactions by Year

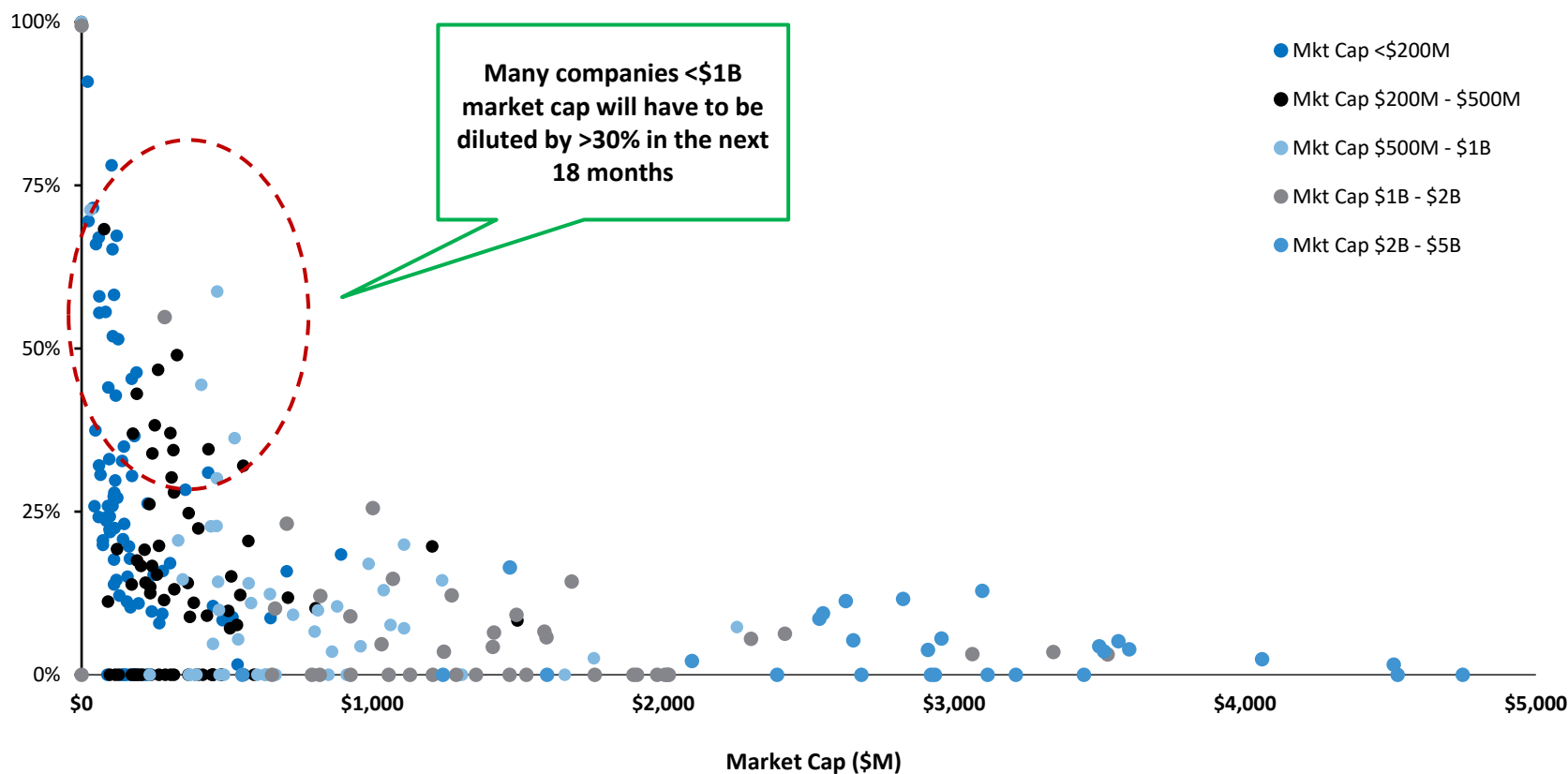


Source: CapIQ and Company press releases.

Tightening Financing Environment will Prompt Small Companies to Consider Strategic Alternatives

POTENTIAL NEXT 18 MONTHS DILUTION % REQUIREMENT ANALYSIS BASED ON 202 BIOTECH COMPANIES

Dilution % Needed (%)



Source: CapIQ and Company SEC Filings as of May 1, 2020.



3. OVERVIEW OF COVID-19 IMPACT

Key COVID-19 Considerations

1 INFECTION RATES

- EU is stabilizing while US rates increase due to higher testing rates
- Rates of positive testing are highly variable by region based on testing criteria
- Resurgence is occurring in Singapore and China

3 NEW NORMAL

- Gradual reopening will face challenges
- Molecular testing capacity to detect new infection will approach 15-30M/month in June
- Cowen estimates 45-85M tests by Aug 2020 and 100M tests done by 2021 (50% in US)
- Serology testing capacity to detect cured patients will be 50-100M by June
- Data from prior coronavirus infections showed that 6 of 9 patients were able to be re-infected but whether relevant to SARS-CoV-2 is unknown

5 VIRAL STRAINS

- Wuhan data identified 19 novel SARS-CoV-2 mutations with differential pathogenicity
- 5 new strains were found in Iceland from sequencing
- Most virologists still believe vaccines will outpace immuno-evasive mutations

2 HERD IMMUNITY

- Herd immunity is likely very low
- Containment could last into 21/22 w/o vaccines/therapeutics
- Iceland data suggests infection rates are stable and not decreasing despite containment

4 THERAPIES

- To bend the curve, therapies must work early during infections to prevent hospitalizations and spread
- HCQ data is getting weaker
- Remdesivir data encouraging but hard to interpret against retrospective studies
- HCQ and remdesivir data expected soon
- Regeneron, Vir and Amgen developing antibodies

6 WEATHER

- Transmission through surface contact likely to drop in warmer/higher humidity weather
- Impact on airborne virus not yet established
- Singapore, Brazil, Miami, New Orleans, Iran all seeing outbreaks despite warm weather

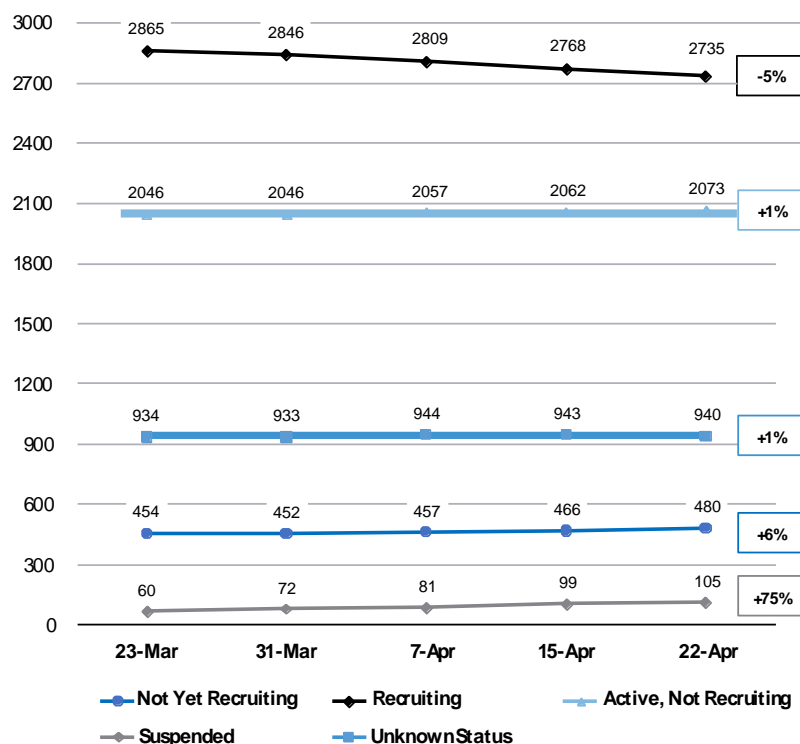
Assessing Clinical Trial Disruption - Week 5

Analysis of CT.gov continues to show modest trial disruption, although negative signals are accelerating

- Over the past 5 weeks, total trials decreased <1% (6359 to 6333), but recruiting trials decreased by 5%
 - Trials with 2020 primary completions, a rough measure of enrollment, decreased by 4%
 - Suspended trials increased from 60 to 105; April trial starts are in line with 2015-19 average

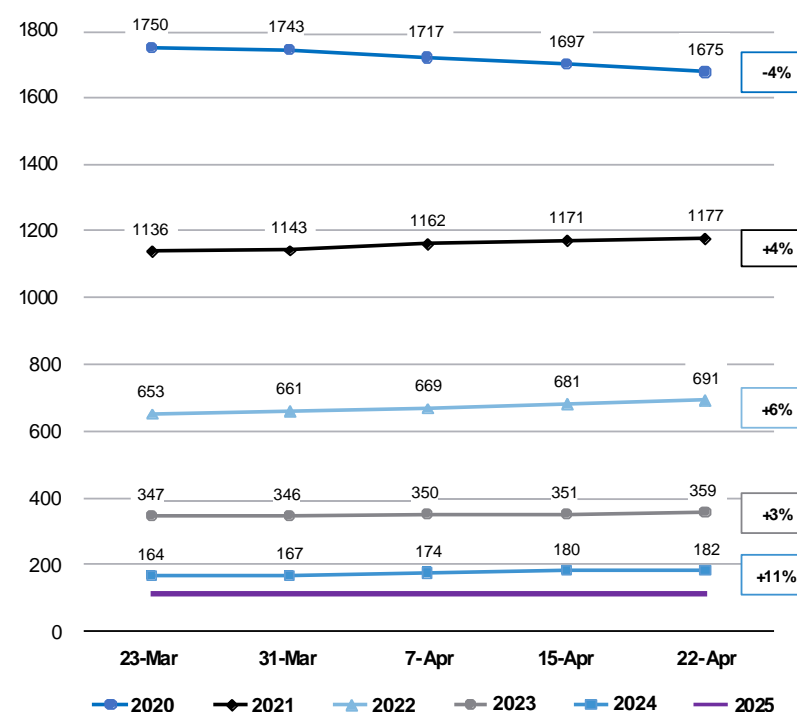
TOTAL TRIAL STATUS - 3/23 TO DATE

Number of Trials



TOTAL PRIMARY COMPLETION DATES - 3/23 TO DATE

Number of Trials



Companies are required to update Clinicaltrials.gov within 30 days of a change but the database is an imperfect tool, and given the high degree of uncertainty, sponsors may be hesitant to alter postings promptly

The “So What”

- While we are seeing trial delays and other headwinds from the COVID-19 pandemic affect the sector, we think the **outlook for biotech remains positive** because **the fundamentals in biotech are largely the same**
- **Biotech CEOs are well-equipped** to deal with the crisis and possibly more-so than CEOs in other sectors
- We have already seen **an uptick in financing activity in the past few weeks**; we believe the **biotech market is open** and investors are looking to put capital to work
- With all of this in mind, below are **key takeaways** to consider as we move forward:
 - **Chance Favors the Prepared Mind** – importance of running scenarios and working out the plans to support each (driven by clinical delays, financing, data outcomes); use this and continue to revisit with your Boards/teams
 - **Adaptability/The Pivot** – orienting your teams to be able to adapt strategies and change course to seize opportunities and better position for the future in this environment
 - **Leaning into Leadership** – for yourself as CEO and your leadership team; don’t let a good crisis go to waste... the value of communication and support of your teams is of critical importance, now more than ever
 - **Core Values and Culture as Guide** – this will separate the weak from the strong (we are seeing this already)
 - **Building Your Network** – continue to focus on building those relationships (early on and in advance of needing them) with potential partners, bankers, advisors to help guide you through

Q&A



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