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We have lived through an extraordinary year for the biopharmaceutical industry. Given excellent protection data on two COVID-19 vaccines we now appear to be at the beginning of the end of the COVID-19 pandemic. A “return to normalcy” appears possible in 2021 despite a very challenging situation at present with the pandemic.

In this report we discuss three topics that are front of mind in our industry:

- **#1** Given the exceptional performance of the biopharma market in 2020, what does 2021 hold?

- **#2** It appears likely that with widespread vaccination, the COVID-19 pandemic will recede in 2021. What does this imply for the biopharma sector?

- **#3** What are the implications of the U.S. political situation for the global biopharmaceutical sector?
An Extraordinary Year:
Top 10 Biopharma Events of 2020
COVID-19 Vaccines Portend a New Normal

The FDA has approved two COVID-19 vaccines as of Jan 2021 and more vaccine approvals are likely. High level of global coordination between regulators and industry a triumph for the industry.

<table>
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<tr>
<th>Event</th>
<th>COVID-19 Vaccines Approval Timeline</th>
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We expect that much of the world will be able to access COVID-19 vaccines by Q3 2021.
“Continuing the spate of stunning news about COVID-19 vaccines, the biotech company Moderna announced the final results of the 30,000-person efficacy trial for its candidate in a press release today: Only 11 people who received two doses of the vaccine developed COVID-19 symptoms after being infected with the pandemic coronavirus, versus 185 symptomatic cases in a placebo group. That is an efficacy of 94.1%, the company says, far above what many vaccine scientists were expecting just a few weeks ago. More impressive still, Moderna’s candidate had 100% efficacy against severe disease. There were zero such COVID-19 cases among those vaccinated, but 30 in the placebo group, including one death from the disease.”

Vaccine development typically takes years, even decades. The progress of the last 11 months shifts the paradigm for what’s possible, creating a new model for vaccine development and a toolset for a world that will have to fight more never-before-seen viruses in years to come. But the pandemic wasn’t a sudden eureka moment — it was a catalyst that helped ignite lines of research that had been moving forward for years, far outside the spotlight of a global crisis.”

“The world’s hopes have weighed heavily on the quest to develop coronavirus vaccines, with an especially intense focus on two front-runners: one from Moderna, the other from Pfizer and BioNTech. Both were a speedy but risky — even controversial — bet, based on a promising but still-experimental medical technology. Why, some scientists debated in the spring and summer, would the United States gamble on a type of vaccine that had never been deployed beyond clinical trials when the stakes were so high?

Vaccine development typically takes years, even decades. The progress of the last 11 months shifts the paradigm for what’s possible, creating a new model for vaccine development and a toolset for a world that will have to fight more never-before-seen viruses in years to come. But the pandemic wasn’t a sudden eureka moment — it was a catalyst that helped ignite lines of research that had been moving forward for years, far outside the spotlight of a global crisis.”

“The COVID-19 experience will almost certainly change the future of vaccine science, says Dan Barouch, director of the Center for Virology and Vaccine Research at Harvard Medical School in Boston, Massachusetts. “It shows how fast vaccine development can proceed when there is a true global emergency and sufficient resources,” he says. New ways of making vaccines, such as by using messenger RNA (mRNA), have been validated by the COVID-19 response, he adds. ‘It has shown that the development process can be accelerated substantially without compromising on safety.’"
By our calculations, biopharma companies raised $120.3 billion in equity in 2020, shattering the all-time previous record of $78.5 billion raised in 2018.

Venture (private) equity raised was $36.9 billion – up 31% from the previous high year of 2018.

Public follow-on equity raised $63.6 billion, up from $39.4 billion raised in 2018.

IPO equity raised was $19.8 billion up from the previous high of $8.5 billion in 2015.

An additional $5.8 billion was raised by healthcare SPACs in 2020.

Sources: CapitalIQ, Torreya internal databases and Crunchbase.
Total net cash on the balance sheets of the top 500 biotechs by value is at $77 billion, up from $48 billion, the year before. The number of biotechs with $100mm+ in net cash as of Q3 2020 was 214 versus 151 at year-end 2019. Spend is also up with 76 companies burning over $100mm a year versus 65 companies burning this much a year earlier. Not shown but also important, the number of companies with less than $30 million in net cash is down significantly from recent years.

Source: CapitalIQ. Biotechs were defined as companies in the biopharma sector that do not yet have a commercial product.
We saw very little M&A activity in the first six months of 2020 and then activity picked up to essentially the same pace as was seen in 2019. Each year for the last five years has generally been dominated by one or two companies who are using M&A to reshape their strategy. In 2019, AbbVie and BMS were both busy with major acquisitions; 2018 saw Takeda buy Shire and Sanofi buy Bioverativ etc. The largest users of M&A and creative structuring in 2020 were AstraZeneca and Gilead. By year-end 2020 AZ had established itself as one of the world most important players in COVID-19 vaccines and the world leader in immunology. By year-end, Gilead has positioned itself as a major world player in oncology for the first time. Gilead carried out numerous deals including four major oncology transactions.

The effect of the Alexion acquisition is significant. The consensus revenue estimate for Alexion in 2024 is $7.7bn. With brokers forecasting AZ at $44.8bn in revenue for 2024, the company’s new revenue forecast for 2024 is $52.5bn. Only four other pharma companies are expected to exceed this amount in 2024. Without this deal, AZ would have been ranked #10 by revenue in 2024.
Traditionally, we have seen a very high level of focus in autoimmune disease therapeutics on targets like CD20, TNF-α, IL-4, IL-17 and IL-23. These therapies work through B-cell, T-cell and eosoniphil modulation. The science in autoimmune research has been moving at lightning speed and in 2020 we saw a major upswell in corporate development and capital markets activity in two key new areas: (1) inflammasome and (2) FcRn.

**Inflammasome**

**Defined:** regulates the innate immune response going from detection of external threats to the mounting of a counterattack. Key upstream targets include caspase-1, Gasdermin-D, MK2 and NLRP3. Key midstream targets include IL-1β, IL-18 and IL-1α. Downstream targets include IL-6, IL-33, NF-κB, the JAK/STAT system, adhesion molecules and, ultimately, activation of neutrophils and macrophages.

**M&A in 2021:** Roche acquisition of Inflazome (NLRP3), Sep 2020, $450mm
J&J buy of Bermekimab (IL-1α) from Xbiotech, Jan 2020, $750mm upfront
Novo Nordisk acquisition of Corvidia (IL-6), June 2020, $725mm upfront

**Key Independent Biotechs:**

- AB2Bio
- Acclaris Therapeutics
- Buzzard Pharmaceuticals
- Cantargia
- Flame BioSciences
- Galderma
- Kiniksa
- Morphic Therapeutic
- Nimbus Therapeutics
- Nodthera
- QuenchBio
- Rigel

**FcRn**

**Defined:** Fc Neonatal receptor has an IgG binding site which facilitates the transcytosis of circulating antibodies. Blockage of the IgG binding site can treat any disease caused by autoantibodies. Because over 100 diseases are caused by autoantibodies there is broad utility and value to FcRn IgG blocking agents.

**M&A in 2021:** AstraZeneca acquisition of Alexion, $39 billion
J&J acquisition of Momenta, $6.5 billion
The innate immune system is complex and features multiple actors including macrophages, neutrophils and NK cells. A key pathway is the IL-1 pathway. This pathway operates through priming and activation. Once primed and activated in response to a foreign invader or tissue insult (e.g., smoking), the system generates the NRLP3 assembly which activate IL-1 and IL-18. These in turn transcribe numerous cytokines. Other key innate immune system pathways include adhesion molecules and the JAK/STAT pathway.
Amazon Gets Serious About Pharma

Amazon Pharmacy launched in November. The service allows customers to make pharmacy transactions through Amazon and receive unlimited, free, two-day deliveries if they have a Prime membership. Combined with its PillPack business, Amazon has finally gotten serious about entering the pharma sector.

In the US, distributors and chain stores like CVS and Walmart routinely negotiate drug prices and have substantial market power and margins due to buying power. More generally, the global supply chain in pharma is both complex and inefficient.

Amazon is likely to ultimately have higher market power due to its scale and is also likely to be more efficient because of a sophisticated logistics operation. As a result, Amazon is likely to disrupt the US pharma market. Amazon is reportedly considering entry into other countries where its retail brand and infrastructure is already well established.

"your margin is my opportunity"

Jeff Bezos
CEO, Amazon
Every year in the last decade has seen significant new advances in cancer treatments. Key developments in the 2017-2019 period have included Legend's BCMA-directed CAR-t treatment, ADCs from Immunomedics and Daiichi-Sankyo, TIL therapy, data in KRAS G12C modulation, TRK fusion cancers, RET and ROS1. This year, we would like to highlight several additional pieces of good news for patients in cancer care starting with Menin inhibitors:

### Menin / MLL Fusion Biology

Menin is a nuclear scaffold protein that participates in a multi-protein complex that interacts with several transcription factors, and, by doing so, epigenetically regulates gene transcription by coordinating chromatin remodeling. Human ML-2 leukemia (AML) cells lack a normal KMT2A (also known as MLL) gene and exclusively express a fusion protein that associates with menin in ML-2 cells. Nine oncogenic gene fusions have been identified in AML, accounting for over 90% of illegitimate MLL gene recombinations. These fusions in turn drive some cases of AML and are associated with a poor prognosis for the disease. All of these fusion proteins signal through menin. Inhibition of binding between MLL and menin corrects the aberrant effect of menin/MLL fusions on a subset of AML patients.

### Menin / MLL Fusion Program Status

**Syndax:** SNDX-5613 occupies the MLL1 binding pocket on Menin. Syndax reported early results of SNDX-5613 at AACR in June 2020 and noted impressive responses in some patients. Over half of patients treated saw either a complete response (full resolution of their AML) or a partial response.

**Kura:** Kura's KO-539 is an oral drug candidate targeting the menin-KMT2A/MLL interaction for treatment of genetically defined AML patients. Kura reported its first Phase 1 data on KO-539 at ASH in December 2020. Like Syndax, Kura also observed multiple complete and partial response in AML patients that had exhibited advanced disease with MLL gene recombinations.

**Biomea Fusion:** Biomea is taking an irreversible menin inhibitor into the clinic. This should lead to superior target binding. We await their results in 2021.

**Key Biotechs to Watch in 2021:**
Estrogen Receptor Knockout in Breast Cancer

Approximately 80% of all newly diagnosed cases of breast cancer are Estrogen Receptor alpha-positive (ER+). While approved treatments have produced some success in this patient population, many ER+ breast cancers become resistant to therapy. Today, fulvestrant (Faslodex®) - a selective estrogen receptor degrader (SERD) - is the standard of care for ER+ metastatic breast cancer after anti-estrogen therapy. While fulvestrant has validated the importance of ER degradation as a therapeutic intervention, up to 50% of ER can remain when compared to baseline levels after six months of treatment. Arvinas’ ER-directed PROTAC protein degrader, ARV-471, is an oral therapy under development for the treatment of women with ER+ metastatic breast cancer. Arvinas reported encouraging Phase 1 data for its program on December 14, 2020 in patients with advanced breast cancer. All patients had advanced after CDK4/6 inhibitor treatment and exhibited a high rate of resistance independent of ER status. Arvinas noted an average of 62% knockout of ER at the 120mg dose of ARV-471. Further, as shown at right, Arvinas observed deep responses in four of fourteen of these advanced patients – an impressive response given the patients’ stage.

Recent Clinical Findings on ER Knockout

IL-15 Agonism in Solid Tumors

Immunotherapy targeting PD-1/PD-L1 fails to induce clinical responses in most patients with solid cancers. ImmunityBio’s Anktiva® is an IL-15 superagonist fusion protein complex that enhances CD8+ T and NK cell expansion and function and exhibits anti-tumor efficacy in preclinical models. This asset is in Phase 2 or Phase 3 trials in first- and second-line lung cancer, triple-negative breast cancer, metastatic pancreatic cancer, recurrent glioblastoma, and soft tissue sarcoma. On Dec 21, 2020, ImmunityBio announced Phase 2/3 data for Anktiva® in BCG Unresponsive Non-Muscle Invasive Bladder Cancer. The data showed 51 out of 71 evaluable patients (72%) had a complete response (at any time) to intravesical BCG plus N-803 (Anktiva), with 59% probability of these patients maintaining a complete response for at least 12 months, with a median duration of complete response of 19.2 months to date. Other treatments on the market such as Keytruda® have exhibited significantly worse response rates in BCG-unresponsive non muscle invasive bladder cancer (NMIBC).

Recent Clinical Findings on NMIBC with IL-15

AbbVie was officially spun out of Abbott in early 2013.

At the time, the company faced a grim prognosis. The company earned more than half of its revenue from Humira® which faced an imminent patent expiration.

Since the spin, AbbVie has moved far from the abyss. Its shares are up over 200%. AbbVie's management team have coordinated three major acquisitions (Stemcentrx, Pharmacyclics and Allergan) for total consideration of $88 billion, diversifying its product base.

Internal innovation has been even more important. Rinvoq® (a JAK inhibitor) and Skyrizi® (an IL-23p19 inhibitor) are now forecast to deliver peak revenue of more than $15 billion, effectively replacing Humira's 2013 revenue contribution in its entirety.

The effect of AbbVie’s renaissance is visible in our pharma value rankings at right. AbbVie has now moved into the #3 position in the world by value – ahead of Pfizer and not far behind Janssen. AbbVie added more than $40 billion in value in 2020.

Also worthy of note, Roche is now firmly the world’s #1 player by value, having added more than $60 billion in value in 2020. Both GSK and Sanofi, lost value during the year. GSK had jumped nicely in 2019 but gave up the gains and is now the #14 ranked pharma company by value.

Note: for value computation method and universe included in our value ranks see Torreya’s Pharma 1000 report, Sep23, 2020.
China Pharma Sector Becomes the World’s Undisputed #2 Player in Pharma

The Chinese government has strongly encouraged investment in innovative therapeutics and growth in its biopharma industry since 2015. The government’s motive has been to provide its people with access to the best medicines available. These efforts have resulted in expanded investment in both established companies and biotech companies. There is little doubt, given events in 2020, that the Chinese pharmaceutical sector is both globally relevant and poised to contribute to the development of medicines worldwide for many decades to come.

The China Pharma Sector in 2020

1. China started 2020 tied with Switzerland for the world’s #2 position in our country pharma sector value rankings. The total value (sum of enterprise values) of Chinese-domiciled biopharma companies grew by 43% in 2020 to $842 billion. In contrast, the Swiss-domiciled sector grew in value by 13% and the U.S.-domiciled pharma sector grew in value by 21%. Today, the China sector is the clear #2 pharmaceutical industry by value in the world.

2. For the first time, a Chinese company (Hengrui Medicine) is ranked in the global pharma top 20 by enterprise value. Hengrui ended 2020 with an enterprise value of $91 billion and is now ranked #18 in the world by value (ahead of Gilead and not far from Takeda’s valuation).

3. In 2018 there were 18 biopharma IPOs of China companies which raised a total of $1.7 billion. In 2020 there were 72 biopharma IPOs which raised $7.4 billion. To compare, there were 64 IPOs of US biopharma companies in 2018 and 76 such IPOs in 2020.
Viatris was officially launched on November 16, 2020. This was a week after the first COVID-19 vaccine data and right on top of Moderna’s vaccine data release. The Viatris story was completely lost in the pandemic-dominated news.

The launch of Viatris is big news for the pharma sector. Created by the combination of Pfizer’s legacy product business (Upjohn) and Mylan, Viatris is a global powerhouse in generics, brands and legacy brands.

Today, Viatris stands as the world’s largest company that primarily sells generic pharmaceuticals and off-patent brands. Well ahead of Teva, Sandoz, the India players and the China generic players.

Headquartered in Pittsburgh, Viatris has major operational centers in Shanghai, China and Hyderabad, India. Viatris is well positioned for growth and has the opportunity to shape the health of tens of millions of patients in the years ahead.

With full access to Pfizer’s legacy product suite, Viatris stands alone among generic pharmaceutical companies in that it has a truly global sales and marketing platform, reaching 165 countries with its products.

As noted in the press release on the day it was born: “Viatris is a new kind of global healthcare company whose mission is to empower people worldwide to live healthier at every stage of life by expanding access to medicines regardless of geography or circumstance; advancing responsible, sustainable operations and targeted innovation to improve patient health; and leveraging its collective expertise to connect more people to more products and services.”
We are ending where we began. Vaccines for COVID-19 represented an extraordinary display of virtuosity by the biopharma industry in 2020.

But this was just the beginning. The year saw countless translational breakthroughs in fields such as biologics, bioelectronics, cell therapy, gene editing, gene therapies, peptide chemistry, protein degradation, radiopharmaceuticals, RNAi and vaccines.

The pharma sector, thought to be dying a decade ago, is in a golden age – fed by rapid innovation facilitated by an increasing focus on structural biology, the role of genetics in disease, a deeper understanding of immunology and fibrosis and an increasing ability to deliver targeted therapies. The right therapy to the right patient at the right time.

If there was one key event in 2020 it was this: innovation won.

Innovation won in the stock market. Innovation won in the boardroom. And, most importantly, innovation won for patients with an unprecedented number of drug approvals.

The innovation surge is probably most visible in the stock market which capitalizes future expected profitability. The chart above shows the percentage change in aggregate enterprise value of each subsector of the biopharma economy in 2020. No sector came close in value accretion to biotechnology – the most innovative part of the sector. And, among biotechs, we saw companies focused on NCE’s rather than reformulations do the best by far.

Note: for value computation method and universe included in our value ranks see Torreya’s Pharma 1000 report, Sep 23, 2020.
Biopharma Sector: Outlook for 2021
The Stock Market for Biotech and Pharma

Statistically speaking, there is a 73% chance that the biotech market will close 2021 higher than where it started.

We saw a volatile biotech market in 2020.

Ultimately, the Nasdaq Biotech Index ("NBI"), a widely watched index of the market activity, was up for the year (up 26% from Dec 31, 2019 to Dec 31, 2020).

We analyzed NBI history to see if there might be patterns that could shed light on what 2021 might hold.

Our analysis found the following:

1. The NBI was up 19 of the last 27 years (73% of the time).
2. We looked at down years and up years and found that if an up year took place the odds that next year would be up (72%) was statistically the same if the previous year was down (75%).
3. We carried out the same analysis using monthly data and found the same. The direction of the market in one month has no predictive value for what the next month might bring.
4. There was one “extreme month” that felt like the late stages of a bubble – in Feb 2000 when the NBI went up 45% in one month. The next month, the index fell by 26%.
5. This leads us to ask the question of whether the market appears to be significantly overheated.

Nasdaq Biotech Index History, 1994-2020

Source: CapitalIQ.
Is the Biotech Market Overheated?

While there are some signs of excess, we do not believe that the biotech market as a whole is overheated.

Tradition has it that late in the cycle, we will see more small cap companies exhibit high returns, more IPO activity and more participation from retail investors (and day-traders) in the biotech market. In the down cycle, retail investors (and non-specialist investors) are thought to leave the biopharma sector causing prices to fall. Are we in one of those more heated periods? In a way one can argue yes. We are seeing:

(1) Very strong returns in small cap. The NASDAQ Small-Cap Biotech Index was up 68% last year while the NBI (which has many more large cap names) was up only 26%.

(2) High valuation in private rounds and IPOs. IPO pre-money valuations are routinely over $500mm, much higher than several years ago; and IPO amounts raised are up substantially from years past.

(3) Clear evidence of heavy day-trading in some biotech stocks. This was seen in names like Greenwich Life Sciences and Sellas Life Sciences in December around the San Antonio Breast Cancer conference.

Despite these signs of excess we believe that the biotech market has significant remaining upside potential. The reasons are straightforward:

(1) As a normal part of our business we frequently conduct NPV analyses of pharma and biotech companies for potential acquirors. We have noted in recent months that there are more companies in the market that are trading cheap relative to their intrinsic value.

(2) M&A activity in the last 24 months (excepting the first three months of the pandemic) has been historically high. Our conversations with big pharma give no evidence that M&A activity is going to scale back in 2021. If anything, there are more companies with strong balance sheets and an offensive stance on M&A activity at present. This fundamental may presage an up market.

(3) In addition, there are much stronger limits on leverage available to speculators, especially retail investors today than in late 1999 / early 2000. This coupled with the much larger scale of the market makes it much more difficult for retail-driven speculation to drive biopharma valuations into a “bubble” type situation except perhaps in some small-cap stocks.
IPO and Follow-On Activity Likely

Unlike the market, IPO activity (and equity issuance activity more generally) is mean-reverting

We saw an extraordinarily strong biotech IPO market in 2020. We carried out some statistical analysis on IPO history to see if there might be patterns that would shed light on 2021.

Our analysis found the following:

1. Total IPO volume rose from the previous year in 18 of 30 years analyzed (60% of the time).
2. With a growing and ever-more important sector one should expect a secular upward trend in IPO activity.
3. We looked at down years and up years and found that if IPO this year was higher than the year before (an up year) then the odds of an up year in the next year would be 53%.
4. In contrast, if IPO activity was down this year versus the last then we saw that there was a 75% chance of an up year for IPOs.
5. Given that we are coming off a strong up year, we think the odds that IPO activity is up this year are around 50/50.
6. It’s important to note that implied volatility in the overall market (tracked by the CBOE Volatility Index or VIX) was up significantly after the COVID-19 pandemic began and has started to normalize. Historically, normalization of the VIX has been associated with a stronger IPO market.
7. On the whole we believe that, if anything, equity issuance activity in the biopharm sector will rise in 2021 rather than fall.
Venture Capital Fundraising Hit an All-Time Peak in 2020

Venture funding activity tends to be strongest in strong equity markets.

This is because venture investors can readily translate between investee company actions and value that is achievable in the case of successful scientific or clinical outcomes in the market via an IPO.

Given the strong market, the high amount of innovation and our view that the IPO market will be both open and strong we believe that this will remain a strong year for both traditional VC funding of biotech and crossover investor activity.

We are aware of dozens of companies that are in the process of completing private venture financings at present.

The chart at right shows that venture funds have broken all previous records with nearly $30 billion of announced money raised. This does not include the significant pool of capital that has gone into evergreen funds.

Obviously, the high amount of capital put into life sciences venture funds in the last year augurs well for financing volume in the years ahead. These funds get paid fees for putting the money to work and will obviously be on the lookout for attractive opportunities.

Sources: Torreya venture fund database, Pitchbook, Preqin
Twenty Topics we are Monitoring in 2021

**Business**
1. Potential major M&A from big pharma with buying power, most notably J&J, Pfizer and Roche
2. Significant shift in U.S. biosimilar usage rules, including potential substitution at the pharmacy
3. Greater visibility of Verily Life Sciences including its Project Baseline, CGM portfolio and Galvani efforts
4. Whether interest in SPACs fizzes
5. Reimbursement and commercial uptake of digital therapeutics (e.g., Pear Therapeutics FDA approved products)
6. Greater visibility into results of Bayer’s highly innovative LEAPS program

**Science**
7. Mainstreaming of precision medicine including U.S. legislation to promote the use of and reimbursement of such programs
8. Greater adoption of adaptive, Bayesian trial designs following the I-SPY trial success
9. Greater understanding of macrophage polarity and its importance in cancer and immunology
10. Additional breakthroughs in bioelectronics including from Astellas’ Iota subsidiary
11. Results from new companies focusing on biomolecular condensates (e.g. Faze, Dewpoint, Nereid)

**Clinical / Regulatory**
12. TIGIT data from Compugen, Gilead, Merck and Roche
13. Further great applications of mRNA
14. Potential approval for CAR-t in BCMA
15. Potential data for solid tumor CAR-t including ICT
16. Tau antibodies in Alzheimer’s a-synuclein in Parkinson’s
17. Data from Novartis and Roche in the inflammasome
19. Data from Lilly’s IL-13 drug
20. Phase 3 data on BMS’ TYK2 inhibitor in a range of indications
The Evolving World of Biotech
Company Formation
We have Seen Record Venture Financing Volume Since March 2020

The private venture equity market for biopharma companies is on fire. December 2020 set an all-time record for private funds raised in a single month.

Sources: Torreya venture transaction database, Crunchbase, CapitalIQ, Biospace.
We have been impressed by the speed of new biotech company formation and the pace of capital formation in 2020. This is a reflection of participation by professional company formation groups and crossover funds.

1. Early financing rounds are getting larger and will likely continue to grow. Venture firms and other professional company builders seem themselves increasingly as sources of value rather than just capital.

2. We have noted huge teams of in-house company formation professionals. Many VC’s, hedge funds and independent firms are involved in this activity. VC funds have grown significantly as a result. Remember when VC firms had just three to ten people? We see this trend of “industrialization” of company formation continuing. We refer to venture creation teams as professional company formation groups.

3. In-house formed companies are focusing on relatively early stage projects. The science is moving very quickly and on many fronts creating numerous high IRR development opportunities that can match fund objectives.

4. A key result is more rapid derisking of biotechnology ideas - Moore's law is now finally applying to biology.

5. Genomics is shrinking timelines for drug development and lowering costs. This trend will continue.

6. Even in the lipid field, lipidomics tools now make it possible to address new classes of targets and biomarkers (ceramide is the new cholesterol...).

7. A key driver is that probabilities of success have risen due to application of precision medicine approaches.

8. Also notable is application new Rx modalities such as engineered cell products.

9. Moderna is the poster child for this Moore's Law phenomenon. Rapid access to capital for an excellent idea and new drugs delivered at a high speed.
Evolving Venture Model

More and more, professional company creation groups such as Atlas, Flagship, Fortress, Paragon or RA Capital are creating very good biotechs. These groups disintermediate the entrepreneur and then skip subsequent venture rounds by going straight to crossover investors and an IPO. An alternative format (also common) features a situation where the entrepreneur skips the VC and goes straight to crossover investors. The days when entrepreneurs hunted for cash endlessly on Sand Hill Road are largely behind us.

How the Venture Model Used to Work

- Scientist makes an important discovery
- An entrepreneur licenses rights to the discovery and creates a business plan to translate the idea to a drug concept.
- The entrepreneur builds a team and raises a seed round from friends and family to turn the concept into reality.
- The company starts to execute while management approaches venture capitalists to fund the business.
- VC's fund the business (hopefully) and after making significant progress...
- ... the company goes public or exits via a trade sale.
- Go public or exit via a trade sale (most likely goes public).
- The venture fund builds a team and funds the company.
- The company does a crossover round as part of the IPO prep process.
- The company starts to execute at rapid speed.

How it is Working Now (Increasingly)

- Scientist makes an important discovery
- A search team at a professional company group spots the idea and licenses rights to the technology into a newco.
- The venture fund builds a team and funds the company.
- The company starts to execute at rapid speed.
Rapid Biotech Company Formation: Fed by an Improving Resource Pool

The rapid pace of biotech formation has been fed by ever more sophisticated investors, outsourcing and the rich pool of talent that is entering the field.

1. The **public buyside** has become much more sophisticated. Today, there are far more technically-trained professionals on the buyside who are able to understand and price opportunities even in early science.

2. This helps to explain the $1bn+ valuations that are increasingly accorded to early platform companies such as ORIC, Black Diamond or Revolution Medicines.

3. Investors are more proficient and the market has become more efficient.

4. ** Outsourcing businesses ** - CROs, CDMOs and full-service outsourcing partners such as Indegene continue to grow and evolve. This has allowed early stage companies to manage costs and operations in a highly capital efficient and effective way.

5. As an example, a new company can rival a big pharma in antibody production today by contracting with a group such as Adimab, Alloy Therapeutics or Genscript.

6. The depth, breadth and experience of **operating teams** is improving dramatically as the industry matures. There are many repeat entrepreneurs who bring skills that were honed before to new products.

7. Because of the improved capital raising process it is easier to have a team focus on execution rather than endless fund raising.

8. Plus, executives are **leaving large pharma in droves** bringing critical human capital to biopharma startups. In the past it was much more difficult to convince an executive to leave behind a comfortable perch and pension in a large pharma. Now, they can land in a well-funded (but to them, still tiny company), where they can focus on execution, with far fewer layers of management and meeting minutes to generate.
Implications of the U.S. 2020 Elections for the Biopharma Sector
2020 U.S. Presidential Election Results: Joseph Biden Wins

- Joe Biden won the Electoral College with 306 votes compared to 232 votes for Donald Trump on Jan 6, 2022.
- The election was clear and indicated that U.S. population was ready for a change relative to the Trump presidency.
- An important determinant of the election result was the perception that the Trump Administration could have done a better job managing the COVID-19 pandemic in 2020.

2020 U.S. Presidential Election Results: Congressional Outcomes

### U.S. Senate

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- Following a runoff election in Georgia on Jan 5, 2021, the Democrats won two seats giving them 50 seats in the Senate.
- Ties in the Senate are broken by the Vice President giving Democrats effective control of the Senate.
- The outcome of the election was somewhat surprising, giving the Democrats control of the Senate, the House and the Executive Branch. This also happened in the first term of the Obama Administration.

### U.S. House of Representatives

<table>
<thead>
<tr>
<th>Democrat</th>
<th>Republican</th>
</tr>
</thead>
<tbody>
<tr>
<td>222</td>
<td>211</td>
</tr>
</tbody>
</table>

- Following the 2020 election, Democrats hold 222 seats while Republicans hold 211 seats.
- House members, on average, tend to espouse healthcare and pharma regulation policies that are more liberal than the Senate.
- The Healthcare subcommittee of the House Ways and Means Committee will be an important player in global healthcare policy in the next two years, as will be the Committee on Appropriations and the Committee on Energy and Commerce.
More Aggressive Stance on Covid-19

We expect that the Biden Administration will be more likely to encourage wearing of masks, lockdowns and social distancing actions to combat the Covid-19 pandemic. We expect that actions on Covid-19 will be front and center following Biden's inauguration on January 20, 2021. Most importantly, these should include pro-vaccine messaging, explaining to the American people that getting vaccinated is essential.

Xavier Becerra, Nominee for Secretary of HHS, is a Likely Activist

Previously a member of the House Ways and Means Committee and thus highly familiar with U.S. Healthcare policies and how they influence states and citizens.

Worked aggressively as California Attorney General to overturn federal actions against the Affordable Care Act ("ACA") and contraception.

Seen as likely to restore the focus of HHS on science and medicine and to be highly supportive of the FDA.

Other likely actions include rebuilding the CDC, strong support for NIH, support for telehealth, support for broader investment in infectious disease prevention, revitalization of PCORI, etc.

Reversal of Trump Executive Actions Likely

Julie Rovner of KHN writes on Jan 8, 2021:

“The party split in Congress is so slim that, even with Democrats technically in the majority, passing major health care legislation will be extremely difficult. So speculation about President-elect Joe Biden's health agenda has focused on the things he can accomplish using executive authority.

For example, the Trump administration made it easier for those who buy their own insurance to purchase cheaper plans that don’t cover all the ACA benefits and may not cover preexisting conditions. It also eliminated protections from discrimination in health care to people who are transgender.

Trump’s use of tools like regulations, guidance and executive orders to modify health programs “was like an attack by a thousand paper cuts,” said Maura Calsyn, managing director of health policy at the Center for American Progress, a Democratic think tank. Approaching the November election, she said, “the administration was in the process of doing irreparable harm to the nation’s health care system.”

Reversing many of those changes will be a big part of Biden’s health agenda, in many cases coming even before trying to act on his own campaign pledges, such as creating a government-sponsored health plan for the ACA.”
Because the U.S. is the world’s largest pharmaceutical market and the only large market where government does not set drug prices, industry will be watching the Biden Administration carefully.

**Healthcare Coverage**

We think that major changes in healthcare coverage such as single-payer healthcare or even the much discussed “public option” will be difficult to implement with a divided Senate. Executive Orders will be relatively important.

However, the U.S. fiscal situation is not great due to years of deficit spending and aggravated by recent Covid-19 relief spending. The fiscal situation of many states is even worse. We believe that a potential outcome is that the U.S. government will offer higher funding to states for supporting Medicare and Medicaid programs in exchange for uniformity in implementation and expansion of such programs to all persons within a certain distance of the poverty line. While we do not doubt that some conservative states will resist such change, most states would be likely to go along in order to obtain access to much needed federal funds.

Such expansion of federal spending on healthcare is fundamentally positive for the pharmaceutical industry worldwide. Greater access to healthcare will likely translate to greater spend on pharmaceutical products.

**Drug Pricing**

The Centre for Responsive Politics’ Open Secrets indicates that the pharma industry gave $6.3 million to Biden in the Presidential election and $1.6 million to Trump and, overall, more to Democrats. This indicates that pharma may anticipate that Biden will be a net positive for the pharma industry.

The Trump Administration was relatively passive on drug pricing regulation until its final months when executive orders were proposed that allowed Medicare to look at foreign price levels when setting U.S. reimbursement levels and following most-favored-nation pricing. In practice, we expect that all of these changes will be reversed in the Biden administration and are already being stymied in the courts.

Biden has openly advocated avoidance of direct regulation of drug pricing but has instead indicated that he favors the “German system” which involves negotiation of drug prices with producers using objective health technology assessments. This has already begun informally in the United States with increased reliance on assessments conducted by ICER.
### Other Policy Areas to Watch

#### Antitrust
- Xavier Becerra, newly appointed HHS Secretary, has been aggressive on antitrust topics before. Further, Merrick Garland, Biden’s nominee for Attorney General, is a renowned antitrust scholar and, previously, on the bench, has been sympathetic to FTC antitrust challenges based on Section 7 of the Clayton Act.
- We saw the FTC be quite tough on the AbbVie / Allergan merger in the Trump Administration.
- We believe that the Biden Administration will be even less sympathetic to large pharma mergers. Larger horizontal mergers of big pharma strike us as quite unlikely to survive antitrust scrutiny.

#### Biosimilars
- Many biologics have successfully staved off biosimilar competition in recent years through unintended Medicare incentives for physicians to use higher-priced drugs (ASP+6 pricing) and the FDA’s decision to generally not permit biosimilars to be substitutable for brand drugs.
- We believe that actions promoting the use of biosimilars are quite likely in the Biden Administration as these would reduce spending at a time when budget pressures will be high. Almost all other countries permit substitution.
- We also expect to see measures to promote biosimilar substitution in the first two years of the Biden Administration.

#### China
- President Biden has been relatively hawkish versus China over time and favors an organized policy to counter China’s expanding global power.
- A key aspect of Trump’s China policy has been CFIUS reviews to prevent Chinese company acquisitions of U.S. assets. While never publicized a number of China pharma M&A attempts have been blocked.
- An important opening has been the high licensing activity between the U.S. and China which has not been restricted.
- We believe that the CFIUS process is likely to be somewhat relaxed under Biden and that licensing activity will continue.
- Healthcare is a great area for cooperation for both countries that does not have national security implications.

#### Precision Medicine
- Precision medicine has started to transform the pharma sector in recent years by facilitating the targeting of therapeutics with biomarkers.
- Like biosimilars, there is an opportunity to both advance medicine and reduce spend by promoting the use of precision medicine. This feels like a “win-win” bipartisan area for cooperation in a divided Congress.
- Congressman Eric Swalwell introduced a bill to Congress in 2019 supporting precision medicine. We understand that this bill will likely be revived in 2021 and we think it has a good chance of becoming law. The bill would improve insurance coverage for genetic testing and ask HHS to pilot a program to significant expand carrier testing and other genetic testing measures for children.
The chart at right was produced by the **Pete Peterson Foundation** and shows the worsening fiscal situation of the United States of America. Even before the pandemic, the Trump Administration was not restrained on spending. Following the pandemic, the inevitable consequences of higher interest expenses on a larger debt and growth in entitlement programs are likely to significantly increase the federal debt relative to the overall size of the economy.

The only other major industrialized countries with greater debt loads are Japan, Italy and France. Countries that are close include Spain, Canada and the UK.

<table>
<thead>
<tr>
<th>Country</th>
<th>Debt / GDP</th>
<th>S&amp;P Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>237</td>
<td>A+</td>
</tr>
<tr>
<td>Italy</td>
<td>135</td>
<td>BBB</td>
</tr>
<tr>
<td>France</td>
<td>98.1</td>
<td>AA</td>
</tr>
<tr>
<td>United States</td>
<td>98</td>
<td>AA+</td>
</tr>
<tr>
<td>Spain</td>
<td>95.5</td>
<td>A</td>
</tr>
<tr>
<td>Canada</td>
<td>89.7</td>
<td>AAA</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>80.7</td>
<td>AA</td>
</tr>
<tr>
<td>European Union</td>
<td>79.3</td>
<td>AA</td>
</tr>
<tr>
<td>India</td>
<td>69.62</td>
<td>BBB-</td>
</tr>
<tr>
<td>Germany</td>
<td>59.8</td>
<td>AAA</td>
</tr>
<tr>
<td>China</td>
<td>50.5</td>
<td>A+</td>
</tr>
<tr>
<td>Switzerland</td>
<td>41</td>
<td>AAA</td>
</tr>
<tr>
<td>South Korea</td>
<td>36.6</td>
<td>AA</td>
</tr>
<tr>
<td>Sweden</td>
<td>35.1</td>
<td>AAA</td>
</tr>
<tr>
<td>Taiwan</td>
<td>30.9</td>
<td>AA-</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>22.8</td>
<td>A-</td>
</tr>
<tr>
<td>New Zealand</td>
<td>19</td>
<td>AA</td>
</tr>
<tr>
<td>Russia</td>
<td>12.2</td>
<td>BBB-</td>
</tr>
</tbody>
</table>

Source: International Monetary Fund.

Longer Term: U.S. Fiscal Situation Likely to Negatively Impact Pharmaceutical Industry

Unfortunately, with rising deficits the U.S. is very likely to change its approach to drug pricing at the federal level. We cannot predict when this will happen but think that major change in drug pricing approach is conceivable within the next five years. The chart at right, also produced by the Pete Petersen Foundation shows that Social Security, Medicare and Medicaid spend will become the dominant element of federal spending. It appears to us inevitable that major cuts in the Medicare and Medicaid budgets are likely.

We are not able to predict how these cuts will impact the pharma industry as the debate has not really even begun to take place. We do think that topics on the agenda could include (1) capitation of spend per disease state per annum (as happens now in ESRD), (2) more direct negotiation of drug pricing, (3) greater promotion of generics and biosimilars, (4) restraints on the use of expensive specialty medicines especially in end-of-life situations. Oncology drug and orphan drug markets have seen high growth in recent years. Both areas could be adversely affected.
Update on Covid-19, Capital Markets and M&A Activity
Course of the Covid-19 Pandemic

Daily New Cases from COVID-19 Worldwide
Jan 28, 2020 to Jan 5, 2021 (smoothed)

Daily New Deaths from COVID-19 Worldwide
Jan 28, 2020 to Jan 5, 2021 (smoothed)

Source: WHO.
Nasdaq Biotech Index Closed at an All-Time High on Jan 8th, 2021

Market drops to 2961 on March 16, 2000 as fear of pandemic hits a peak.

Heavy funds flow into biopharma as the world realizes it is underweight this critical sector. Follow-on and privates volume hit all time records in July – Aug 2020.

Volatility as pandemic resumes and US election jitters set in.

Market closes at 4971 last Friday.

Source: CapitalIQ.
## Market Composition (Breaking Down the Nasdaq Biotech Index)

### Sixty-one percent of component stocks of the Nasdaq Biotech Index rose in 2020.


<table>
<thead>
<tr>
<th>Biggest Losers</th>
<th>Biggest Gainers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company</strong></td>
<td><strong>Market Cap</strong> ($ millions)</td>
</tr>
<tr>
<td>Aprea Therapeutics, Inc.</td>
<td>104.2</td>
</tr>
<tr>
<td>Tricida, Inc.</td>
<td>353.8</td>
</tr>
<tr>
<td>NextCure, Inc.</td>
<td>300.3</td>
</tr>
<tr>
<td>Intercept Pharmaceuticals, Inc.</td>
<td>814.9</td>
</tr>
<tr>
<td>Amarin Corporation plc</td>
<td>1,901.40</td>
</tr>
<tr>
<td>Assembly Biosciences, Inc.</td>
<td>199.8</td>
</tr>
<tr>
<td>Orchard Therapeutics plc</td>
<td>422.3</td>
</tr>
<tr>
<td>Zogenix, Inc.</td>
<td>1,112.90</td>
</tr>
<tr>
<td>VYNE Therapeutics Inc.</td>
<td>265.2</td>
</tr>
<tr>
<td>Esperion Therapeutics, Inc.</td>
<td>724.5</td>
</tr>
</tbody>
</table>

Source: CapitalIQ.
Total Biopharmaceutical Sector Value Crossed the $7 Trillion Mark in January 2021

Aggregate value of the global pharmaceutical industry ($trillions)

Note: This chart is based on Torreya’s analysis of the global top 2000 biopharma firms in the 2003 to 2021 period. Excludes pharma services, API, CDMO, OTC players. Includes public and private biotech, branded pharma companies, royalty companies and animal health pharma companies. The private revenue generating companies in the list are generally valued based on publicly traded company typical revenue multiples times revenue. Major sources: Bloomberg, CapitalIQ, EMIS, Torreya analysis.
2020 Set an All Time Record for Equity Raises in the Biopharmaceutical Sector.
The biopharma IPO market is dominated by the U.S.. But, in recent years, the China IPO market has rapidly become the second most important. At the same time, the European biopharma IPO market has faded.
The volume of equity follow-on offering activity has been at a record level in 2020, led by activity on U.S. exchanges.

Global Follow-on Volume, Biopharmaceutical Sector, by Exchange Region

Source: Data from CapitalIQ.
The dollar volume of debt deals was down in 2020 by 9% from 2019. But deal count was down by 34%, reflecting skittishness on the part of lenders in the COVID-19 period.

Source: Data from Torreya's internal database of life science debt issuances.
The pace of royalty monetizations came close to hitting a record for volume in 2020 and hit a record in terms of transaction count. This market is open and remains well funded.

Source: Data from Torrey's internal database of publically-announced royalty monetization transactions.
Global Biopharma M&A Activity Down Following the Covid-19 Pandemic

M&A volume was down 50% year on year but only down 14% from the average of the last six years.
About Torreya
We are known for:

• **Deep Relationships**
  We have strong personal relationships across the pharmaceutical and healthcare sectors.

• **Operating Perspective**
  Many of our senior colleagues come from industry and bring decades of experience.

• **Deal Excellence**
  Torreya is known as a firm that gets tough deals done. Our team is skilled in highly structured transactions.

• **Healthcare Focus**
  Our healthcare focus spans pharma, biotech, bioproduction, pharma services, physician services and HCIT.

### Representative Transaction Advisory Roles

#### Mergers & Acquisitions

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sawai</strong></td>
<td>Acquisition of generics business of <strong>USP</strong></td>
<td>$1.05 billion June 2017</td>
</tr>
<tr>
<td><strong>Avenue Pharma</strong></td>
<td>Purchase of <strong>Eyevance</strong></td>
<td>$225 million September 2020</td>
</tr>
<tr>
<td><strong>OncoSec</strong></td>
<td>Option to be acquired by <strong>Cipla</strong></td>
<td>$215 million February 2020</td>
</tr>
<tr>
<td><strong>Generic Pharma</strong></td>
<td>Sale of <strong>Santen</strong></td>
<td>$658 million June 2014</td>
</tr>
<tr>
<td><strong>Specialty Pharma</strong></td>
<td>Sale of <strong>Cipla</strong></td>
<td>$215 million February 2020</td>
</tr>
<tr>
<td><strong>Biotech</strong></td>
<td>Sale of majority stake to <strong>IRX</strong></td>
<td>$30 million February 2020</td>
</tr>
</tbody>
</table>

#### Licensing, Asset Sales & JVs

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phenex</strong></td>
<td>Sale of FXR program to <strong>Gilead</strong></td>
<td>Up to $470 million January 2015</td>
</tr>
<tr>
<td><strong>Malinckrodt</strong></td>
<td>Sale of Intrathecal business to <strong>Piramai</strong></td>
<td>$203 million March 2017</td>
</tr>
<tr>
<td><strong>Novaliq</strong></td>
<td>License of NOV03 in North America to <strong>Bausch</strong></td>
<td>License of Navixoza to <strong>Oncology</strong></td>
</tr>
<tr>
<td><strong>Syneos</strong></td>
<td>License of NAVO3 in North America to <strong>Oncology</strong></td>
<td>License of Navixoza to <strong>Oncology</strong></td>
</tr>
<tr>
<td><strong>Bayer</strong></td>
<td>JV Partnership in China with <strong>Merck Serono</strong></td>
<td>$50 Million December 2018</td>
</tr>
</tbody>
</table>

#### Debt, Royalty Sales & Private Equity Deals

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rubicon</strong></td>
<td>Sale of majority stake to <strong>General Atlantic</strong></td>
<td>$125 million April 2019</td>
</tr>
<tr>
<td><strong>Trius</strong></td>
<td>Debt recapitalization &amp; acquisition of <strong>Pfizer</strong></td>
<td>$125 million September 2018</td>
</tr>
<tr>
<td><strong>Sparq</strong></td>
<td>Credit facility from <strong>CRG</strong></td>
<td>$70 million October 2019</td>
</tr>
<tr>
<td><strong>Sparq</strong></td>
<td>Private Equity Placement</td>
<td>$44.5 million October 2020</td>
</tr>
<tr>
<td><strong>Cognate</strong></td>
<td>Sale to <strong>Cobra-Tech</strong></td>
<td>November 2019</td>
</tr>
</tbody>
</table>

#### Representative Transaction Advisory Roles

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PE Recap / Generics</strong></td>
<td>Debit / <strong>Rubicon</strong></td>
<td>$125 million April 2019</td>
</tr>
<tr>
<td><strong>Debt / Specialty Pharma</strong></td>
<td>Debit / <strong>Tris</strong></td>
<td>$125 million September 2018</td>
</tr>
<tr>
<td><strong>Debt / Healthcare Services</strong></td>
<td>Credit facility from <strong>Sparq</strong></td>
<td>$70 million October 2019</td>
</tr>
<tr>
<td><strong>Equity raise / Biotech</strong></td>
<td>Equity raise from <strong>Sparq</strong></td>
<td>$44.5 million October 2020</td>
</tr>
<tr>
<td><strong>PE Recap / Bioproduction</strong></td>
<td>PE Recap / <strong>Rubicon</strong></td>
<td>$125 million April 2019</td>
</tr>
</tbody>
</table>
We cover Latin America, South Africa and parts of Asia through affiliate relationships*

4 people cover the China market from a home base in the United States

34 people based in New York
9 people based in London
5 people based in Mumbai
1 person in Tokyo

* Key affiliate partners are Kybora in Africa and MidEast; Novus Capital in Russia; Natisix in China and Korea; Panarea in Latin America; and GCA in Japan.

Top 20 Investment Banks in Number of Pharma Industry Strategic Deals
Jan 1, 2020 to Dec 31, 2020 by Deal Count and Total Value
(Includes Announced, Pending and Closed Transactions)

<table>
<thead>
<tr>
<th>Deals Rank</th>
<th>Bank</th>
<th>Deal Count</th>
<th>Total Value ($mm)</th>
<th>Average Deal Size ($mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Torreya</td>
<td>15</td>
<td>$2,466</td>
<td>$164</td>
</tr>
<tr>
<td>2</td>
<td>Centerview</td>
<td>14</td>
<td>$59,258</td>
<td>$4,233</td>
</tr>
<tr>
<td>3</td>
<td>Lazard</td>
<td>10</td>
<td>$17,061</td>
<td>$1,706</td>
</tr>
<tr>
<td>3</td>
<td>Goldman Sachs</td>
<td>10</td>
<td>$15,252</td>
<td>$1,525</td>
</tr>
<tr>
<td>5</td>
<td>BAML</td>
<td>8</td>
<td>$57,527</td>
<td>$7,191</td>
</tr>
<tr>
<td>5</td>
<td>Moelis</td>
<td>8</td>
<td>$1,905</td>
<td>$238</td>
</tr>
<tr>
<td>7</td>
<td>JP Morgan</td>
<td>7</td>
<td>$10,210</td>
<td>$1,459</td>
</tr>
<tr>
<td>7</td>
<td>Rothschild</td>
<td>7</td>
<td>$1,611</td>
<td>$230</td>
</tr>
<tr>
<td>7</td>
<td>Stifel</td>
<td>7</td>
<td>$954</td>
<td>$136</td>
</tr>
<tr>
<td>10</td>
<td>MTS Health Partners</td>
<td>6</td>
<td>$987</td>
<td>$165</td>
</tr>
<tr>
<td>11</td>
<td>Evercore</td>
<td>5</td>
<td>$31,286</td>
<td>$6,257</td>
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<tr>
<td>11</td>
<td>Jefferies</td>
<td>5</td>
<td>$4,381</td>
<td>$876</td>
</tr>
<tr>
<td>11</td>
<td>SVB Leerink</td>
<td>5</td>
<td>$1,143</td>
<td>$229</td>
</tr>
<tr>
<td>14</td>
<td>Piper Sandler</td>
<td>4</td>
<td>$648</td>
<td>$162</td>
</tr>
<tr>
<td>14</td>
<td>Ladenburg</td>
<td>4</td>
<td>$188</td>
<td>$47</td>
</tr>
<tr>
<td>16</td>
<td>Barclays</td>
<td>3</td>
<td>$6,238</td>
<td>$2,079</td>
</tr>
<tr>
<td>16</td>
<td>PJT Partners</td>
<td>3</td>
<td>$1,358</td>
<td>$453</td>
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<tr>
<td>16</td>
<td>Nomura</td>
<td>3</td>
<td>$625</td>
<td>$208</td>
</tr>
<tr>
<td>16</td>
<td>Oppenheimer</td>
<td>3</td>
<td>$266</td>
<td>$89</td>
</tr>
<tr>
<td>20</td>
<td>Morgan Stanley</td>
<td>2</td>
<td>$10,925</td>
<td>$5,463</td>
</tr>
</tbody>
</table>

Source: CapitalIQ, Torreya analysis. Deals under $10mm in size excluded from this table. Transactions valued based upon upfront or other non-conditional payments. Credit apportioned by number of advisors on each side of deal.
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Torreya has remained highly engaged with its clients during the COVID-19 pandemic period and is working across the spectrum of the global life sciences sector.
Thank You and Be Safe
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