Health care sector innovation—how biopharma scientists save lives globally

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Understanding the lifecycle of life-changing drugs

FRANKLIN TEMPLETON THINKS™ EQUITY MARKETS
In today’s world of disruptive innovations, biotechnology is entering the most transformative phase our health care analysts have seen in 25 years. Since mapping out the human genome in 2003, drugs using new treatment paradigms—like gene and cellular therapies—have jumped out of laboratories and into the marketplace to tackle humanity’s most vexing diseases.

The newest medicines can sound like science fiction; for patients, the results are quite real. Consider children suffering from late-stage leukemia. In 2017, a newly approved treatment from Novartis, a Swiss-based biopharmaceutical (“biopharma”) company, gave leukemia patients the ability to have their own immune cells reprogrammed to recognize and attack their cancer. For cancer patients and their families, this treatment is life-altering and priceless.

For biotechnology scientists, it’s the start of a new chapter in our understanding of human biological pathways and how we can disrupt diseases.

Technology is also transforming other parts of health care. Big data is reshaping health care delivery by helping insurers and governments lower costs. That said, our focus for this discussion is large biopharma; most of the market capitalization in the health care sector resides here, and large players are better equipped to commercialize new medicines. Small firms often can’t pull this off by themselves.

Looking toward future biopharma revenues, we examine key traits of well-oiled innovation engines—research and development (“R&D”)—that are critical to driving cashflows. If a R&D engine isn’t firing on all cylinders to produce new drugs that command high prices, cheaper copies of medicines can degrade cashflows and market valuations when older drugs lose patent protections.

### Revenue lifecycles

There’s one event that impacts our analyst cash flow models more than any other: drug patent expirations (a.k.a. the “patent cliff”). When a drug’s patent expires, cheaper “generics” can degrade revenue streams and market values if new pills aren’t ready to sell. Top-selling biologic drugs made from living cells were relatively immune to this lifecycle. Now with biologic revenues under pressure from cheaper “biosimilars,” our analysts are evaluating the newest wave of drugs to determine if sustained growth is possible.

### Innovation engines

As big pharma companies acquired smaller biotechnology firms to morph into biopharma, many are upgrading their R&D engines to increase productivity and maintain revenue growth. Our growth and value analysts identify three key traits of superior innovation that biopharma companies continually aspire toward: 1) scientific innovation hubs, 2) collaborative R&D across companies, and 3) data-driven discoveries.

### Emerging disruptors

On the global stage, our value analysts think India’s production of high-quality generics puts it 5–10 years ahead of China’s generic drug makers. Cheaper versions of biologics known as “biosimilars” are now disrupting biopharma revenue streams and altering all our analysts’ cash flow models. In terms of biosimilar innovation, our emerging markets analyst thinks first place for an emerging country goes to South Korea, where companies like Celltrion have carved out market share in Europe where biosimilar uptake is surging.
Biopharma revenues have built-in expirations

If there’s one event our analysts agree impacts biopharma market valuations more than others, it is drug patent expirations. Expirations are part and parcel of the revenue lifecycle of every drug and form the backbone of our analyst cash flow models. Why? Without patent protection, cheaper generics swoop in and drive down drug prices. Revenues can drop with hair-raising speed when a drug reaches the “patent cliff,” as shown in Exhibit 1.

It’s for this reason that new medicines—drugs a decade from patent expiration that command premium prices—are top of mind for every biopharma CEO and our health care analysts. Without a well-stocked pipeline of drugs constantly under development, a drug maker’s prospects can look rather grim.

To illustrate this point, let’s look at a new cancer drug: Vitrakvi (pronounced: vi-träk-vee). The first treatment of its kind, Vitrakvi targets tumors with a specific genetic mutation and is opening the door to a genetics-based approach to conquering cancer. With the precision of a heat-seeking missile, Vitrakvi has shown great success in clinical trials, and could one day reach blockbuster status (defined as having at least US$1 billion in annual sales). Breakthrough medicines like Vitrakvi command premium pricing—a year’s supply of Vitrakvi costs US$393,000 wholesale—and could help Germany’s Bayer deliver healthy cash flows to equity investors.

It’s important to point out here that biologics don’t have patent cliffs; instead, they have a gradual “patent slope.” As we explain in “How scientists make biologics” on the following page, when biologics made the leap from laboratories to the markets in the late 1990s, scientists couldn’t make exact copies of living antibodies (the key ingredient of most biologics) without the confidential production methodology of the original drug. With no revenue expirations on the horizon, biologics gave biopharma CEOs more breathing room to discover the next wave of blockbusters.

Scientists eventually grew antibodies that produced the same therapeutic outcomes of original biologics, just not exact copies—it’s why the industry calls them bio “similar.” Fast-forward to today, sales of cheaper biosimilars are surging across Europe—enough so that future off-patent revenues for many biologics now have a patent slope inside our analyst cash flow models, as illustrated in Exhibit 1.

Looking forward, we think off-patent biologic revenues will fall even more steeply. Governments and consumers are chafing at biologic price tags and eagerly switching to cheaper biosimilars. Now more than before, biopharma CEOs need their R&D engines firing on all cylinders to make up for future lost biologic revenues.

### BIOPHARMA DRUG LIFECYCLE

Exhibit 1: Biologic drug revenues don’t have a patent cliff

<table>
<thead>
<tr>
<th>Research &amp; Development (R&amp;D) Phase</th>
<th>Return Phase</th>
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<td>R&amp;D costs</td>
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Bringing a new drug to market cost US$2.17 billion on average in 2018, up from US$1.19 billion in 2010 according to research from Deloitte. It often takes years of sales just to break even.

Source: Franklin Templeton, for illustrative purposes only.
How scientists make biologics

In the pantheon of biopharma blockbusters, Humira was in a league all its own last year, as shown in Exhibit 2. With US$19.9 billion in global 2018 sales, Humira is now in striking distance of becoming the world’s most commercially successful drug. Pfizer’s cholesterol-busting Lipitor, the reigning champion, has generated more than US$150 billion in lifetime sales.

Like most of last year’s top-sellers, Humira is a biologic, which means it’s derived from living cells and not chemically manufactured. Inside the body, Humira targets a small protein called tumor necrosis factor-α, or TNF-alpha. Some people’s immune system produces too much TNF-alpha, which circulates in the bloodstream and causes inflammation in different areas—from the skin of their neck or finger joints or inside their intestines. Humira’s antibody binds to TNF-alpha molecules and blocks them from attaching to healthy cells. Humira can be life-altering for people crippled by arthritis or inflamed bowels.

Making Humira in bioreactors

Manufacturing biologics like Humira on a commercial scale starts with developing a line of living cells that can reproduce infinitely. The only cells in our bodies that do this are tumor cells, so scientists typically reengineer non-cancer cells to reproduce infinitely. Humira uses cells from hamster ovaries for this stage of the process.

The second step involves instructing the cells to produce the right antibody—for Humira, a TNF-alpha blocker. Since non-human cells produce non-human antibodies, the hamster cells are genetically re-designed to make fully human antibodies. Fun fact: The antibodies in Remicade (one of Humira’s biologic competitors) are 70% human and 30% mouse. The mouse part is why some patients experience allergic reactions from Remicade.

The last step involves sorting out the cells producing the most antibodies and cloning them in “bioreactors”—stainless steel containers of about 3 to 6 liters (under a gallon). The bioreactors must maintain hundreds of patent-protected parameters, including temperatures and dissolved oxygen levels, throughout the process or the antibodies won’t work. The specific set of parameters are unique to each biologic and confidential to the original biologic manufacturer.

Similar biologics that aren’t copies

Cells for Humira take about 15 days to reproduce before purifying the final antibodies contained in a single Humira dose. Without access to the original process parameters, biosimilar manufactures must run expensive clinical trials to verify their therapeutic outcome matches the original biologic. Biosimilars could be compared to snowflakes. The molecular makeup of each biosimilar treatment will look unique, like individual snowflakes, even as it produces the same therapeutic outcome of the original biologic. Patients in Europe can now buy cheaper biosimilar versions of Humira. US patients will have to wait till 2023 because of Humira’s aggressive patent strategy.
Speaking with our health care analysts, it was clear that the inexorable march towards patent expirations makes R&D productivity a linchpin for market valuations. Less clear was if large biopharma firms can innovate the way smaller, nimble firms often do. After years of acquiring and merging with biotechnology firms, are today’s biopharma giants up for the challenge?

Our US growth analyst sensed our skepticism and pointed us to AstraZeneca (“Astra”)—the British-Swedish biopharma. Back in 2012, nearly half of Astra’s revenues were projected to vanish by 2016, as its best-selling drugs were approaching the patent cliff of expirations. Astra’s ability to survive this ordeal gave us a window into large-scale innovation and rebirth. Instead of skimming through a handful of leading companies, we’ve decided to dive deep into Astra’s turnaround story, and three areas of R&D best practices that many large biopharma firms are deploying to great effect.

To grasp the true scope of the industry’s R&D challenge, it’s worthwhile stepping back to understand how biopharma has evolved. Over several decades, biopharma R&D has been shifting away from primary care—treating chronic conditions like high cholesterol in large populations—toward specialty care that serves smaller populations. The low volumes of a breakthrough cancer drug like Vitrakvi, for example, can’t match the volumes of a cholesterol pill sold to millions.

Just as sales volumes are declining, the average cost of bringing a new drug to market has increased to US$2.17 billion in 2018—almost double the average cost of US$1.19 billion in 2010.2 Those costs account for the fact that only one in 10 drugs that go into clinical trials gets approved.3 One cause of failures is that standard clinical trials haven’t evolved in 50 years, and are ill-suited for diseases like cancer that can require mixing treatments (drug cocktails) to merit approval.

Facing expirations on older blockbuster pills, today’s biopharma CEO might need a half dozen niche treatments to maintain growth. Without an R&D engine running full throttle, market values will fall. That’s exactly the situation Pascal Soriot walked into in mid-2012 when he became CEO of Astra. With a colossal patent cliff threatening to cut Astra’s revenues in half, Soriot’s mission was clear: breathe new life into Astra’s R&D operations.

Having known Soriot at Roche, the Swiss biopharma giant, our growth analysts felt he was up for the challenge. Roche houses one of the industry’s premier R&D operations. As chief operating officer, Soriot had successfully assimilated Genentech, a biotechnology company that Roche took full ownership of in 2009. Soriot’s specific task was integrating Genentech’s product development without ruining its highly innovative culture. The time Soriot spent in San Francisco’s vibrant biotech hub (Genentech’s headquarters) helped shape a three-prong strategy for reigniting Astra’s R&D engine.

Plugging into science hubs

Replenishing Astra’s barren R&D pipeline started with the firm’s scientists who form the core of biopharma’s innovation process. By relocating Astra’s research facilities near bioscience hotspots, the spark of innovation can happen more naturally if scientists can easily plug into scientific hubs rich with new ideas and fresh approaches to problem solving.
But moving Astra’s teams cost money. Astra targeted US$1.4 billion for three new state-of-the-art research centers in Britain, Sweden and the US.4 In Britain, research teams moved from Alderley Park in northern Cheshire to Cambridge, where Astra’s scientists could drink up that area’s academic talent and develop partnering opportunities. In Gothenburg, Sweden, Astra started building a new life science cluster that it would eventually develop into an international research arena. In the United States, Astra moved its research and marketing operations from Wilmington, Delaware, to Gaithersburg, Maryland, home to Astra’s Medimmune division and its advanced biologic activities.

Soriot also elevated the firm’s published work, prominently showcasing research in scientific journals—many co-authored with the industry’s top scientists. Annual spending on R&D increased from US$4.8 billion, or 18.7% of total revenue in 2013, to US$5.9 billion, or 26.7% of 2018 revenues.5

**Collaborative cancer cocktails**

With seven new blockbuster drugs in the market today (neck-and-neck with heavyweights like Roche and Novartis), Astra’s turnaround strategy of nurturing its research abilities is clearly bearing fruit. Soriot—whose motto is “follow the science”—is now guiding Astra towards a new collaborative business model in cancer treatments that resembles Genentech’s approach to R&D.

Take Lynparza, Astra’s cancer drug that’s approved for ovarian and breast cancer. The drug inhibits a protein known as PARP1 that repairs damaged DNA in cancer cells zapped by chemotherapy. Women suffering from ovarian cancer who’ve taken Lynparza have seen the risks of their cancer progressing drop by a whopping 70% on average.6 We believe the drug will likely achieve blockbuster sales as a standalone treatment. However, Astra and the biopharma MSD (known as Merck in the United States and Canada) are betting they can broaden Lynparza’s treatment capabilities by mixing it with other drugs inside their respective R&D pipelines, as well as with MSD’s blockbuster biologic Keytruda. Known as a PD-1 inhibitor, Keytruda activates the body’s immune system to attack tumors.

Astra and MSD announced they would co-develop cancer cocktails in 2017, sharing development costs and potential revenues. To cement the partnership, MSD bought half of the rights to Lynparza for US$8.5 billion—US$1.6 billion up front and the rest contingent on sales and regulatory milestones.7 This R&D tie-up marks an accelerating trend in biopharma—particularly in cancer, where drug combos can yield better results. Eli Lilly agrees, and expects to out-license and co-develop one-third of its cancer treatment pipeline going forward.8 To be clear, collaborative R&D isn’t a breakthrough idea—indeed, much older biologics like Roche’s Rituxan were born from research partnerships. Back in Rituxan’s infancy, Genentech knew Biogen’s scientists were experts in the cancer they were targeting and started co-developing the drug with Biogen in 1995. Many of Roche’s top-selling biologics were born from Genentech’s collaborations with scientists at firms like Novartis, ImmunoGen and AbbVie.

**Redesigning clinical trials**

We think mixing laboratory talent across firms makes a lot of sense—sharing R&D costs can de-risk the downside when drug trials fail, while sharing gains from successful breakthroughs. We also think cross-company collaborations could dramatically improve clinical trials with a new design called “master protocols.”

Clinical trials have often been a time-consuming money pit because they test single treatments on one disease sequentially. Master protocols can work faster and more efficiently by analyzing multiple treatments from different drug sponsors on one or multiple diseases. To pull this off, drug sponsors must discuss and agree upfront how they wish to share data, publication rights and the timing of regulatory submissions. The US Food & Drug Administration (US FDA) has received multiple inquiries from companies on master protocols and thinks more will flock to these trials once they see them work.9

**Data-driven discoveries**

Collaborative clinical trials could yield powerful results, but that doesn’t overcome all the hurdles with new drug

“A lot of time and money is wasted manually sifting through data. Boosting productivity with machine learning could augment human decision-making. Algorithms, for example, can process much higher volumes of data than humans can handle.”
discovery. A lot of time and money is wasted manually sifting through data. Boosting productivity with machine learning could augment human decision-making. Algorithms, for example, can process much higher volumes of data than humans can handle. In turn, machines are more likely to discover random (and potentially valuable) biologic associations that have otherwise gone unnoticed.

Looking at biology through new data-driven lenses, however, isn’t something Astra’s scientists were used to. So, in January this year, Astra hired Richard Dearden, who worked on the NASA Mars Rover Project, to boost Astra’s capabilities in machine learning. Reardon’s long-term challenge is to marry Astra’s world of human biology and test tubes with Dearden’s world of computer science. Rearden’s near-term goal is speeding up drug discovery using artificial intelligence. Astra is already deploying technology that analyzes 1.5 million chemical structures in 20 minutes. It currently takes Astra’s scientists far longer to look at a mere 1,000.10

Data could also help Astra transform how it prices certain drugs in the future. For example, Astra would give insurers a rebate if more than a certain percentage of patients taking Astra’s Brilinta medication for heart disease suffer a second heart attack. Soriot thinks drug pricing should (and eventually will) reflect the total costs of diseases—including doctor visits and incredibly expensive hospital stays. The true monetary value of drugs like Brilinta comes from their preventive qualities. Measuring those benefits requires comprehensive patient data from systems like Britain’s National Health Service, which tracks patients’ medical records from cradle-to-grave.

Necessity—the mother of invention

Our growth analysts applaud Pascal Soriot for the work he’s accomplished at Astra. By focusing on innovative medicines treating cancer, Astra received premium pricing for its newest drugs. Through his R&D initiatives, Soriot demonstrated that change is possible, even for large biopharma companies that can breed complacency after multiple acquisitions and mergers. Indeed, our value and growth analysts are seeing this innovation take hold at biopharma giants like Roche, Novartis, MSD and Eli Lilly because they absolutely must. Many of the industry’s older biologics face a looming challenge from cheaper biosimilars. The faster biosimilars take hold in the United States, the faster the biologic patent slope will shift into a cliff.11

Western biopharma hugs China

China is the world’s second-biggest market for biopharmaceuticals after the United States, as illustrated in Exhibit 3. It’s a crucial market for hitting growth targets for companies like Pfizer and Astra—just not in the way it used to be. Instead of simply unloading older off-patent drugs on China, western firms are also bringing their new, more expensive medicines to China’s burgeoning middle class.

When generic drugs dampened sales of off-patent drugs in the United States and Europe, biopharma companies typically aimed their sights on China. Chinese consumers willingly pay a premium for western brand-name pills for one primary reason: they don’t trust China’s locally produced generics.

<table>
<thead>
<tr>
<th>CHINA—THE WORLD’S SECOND-LARGEST BIOPHARMA MARKET</th>
<th>Exhibit 3: Top ten biopharma markets in US$ billion sales 2017</th>
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<tr>
<td><strong>1. United States</strong></td>
<td><strong>$467</strong></td>
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<tr>
<td><strong>2. China</strong></td>
<td><strong>$123</strong></td>
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<td><strong>3. Japan</strong></td>
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<td><strong>4. Germany</strong></td>
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<td><strong>5. France</strong></td>
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<td><strong>6. Brazil</strong></td>
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<td><strong>7. Italy</strong></td>
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<td><strong>8. United Kingdom</strong></td>
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<td><strong>9. Spain</strong></td>
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<tr>
<td><strong>10. Canada</strong></td>
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Consider Pfizer’s blockbuster cholesterol-reducing drug Lipitor. When sales dropped off its patent cliff after 2011, as shown in Exhibit 4, Lipitor clung to its blockbuster status largely from continued sales in China. That trend started changing this year. In an effort to choke the rising drug costs for individual treatments, the Chinese government rolled out a new initiative mandating large public hospitals switch to cheaper generics. Some estimate China could save upwards of US$30 billion with this shift. Beijing has also raised standards for its domestic drug makers, closing the quality gap with western brands. So far, this year’s bidding process has mostly rewarded Chinese generics. As of May, public hospitals in China’s 11 largest cities no longer use Lipitor, Sanofi’s blood thinner Plavix, or Astra’s Crestor—instead relying on much cheaper Chinese generics. It’s a sign of more to come.

Catching up to India

Despite stepping up quality standards, China’s army of small drugmakers still has a way to go before competing on the global stage. Just last year, two Chinese manufacturers revealed they’d sold over one million faulty vaccines, reinforcing the low-quality stereotype. Our value and emerging market analysts estimate China is 5–10 years behind India in terms of producing quality generics.

India is currently the world’s largest exporter of generic drugs, and home to about 6,000 drugmakers, according to its government estimates. US FDA data show Indian firms currently receive almost half of new US approvals for generics. Much to the delight of US and European consumers (and the chagrin of non-Indian generic manufacturers like Mylan) a flood of cheaper Indian generics has dramatically slashed generic prices in recent years.

The relative simplicity of small-molecule chemical compounds is key to India’s success. With its vast supply of cheap labor, and a knack for reverse-engineering chemical compounds, India churns out huge volumes of quality generics at dirt-cheap prices. As a result, today’s generics industry has become a cutthroat low-margin business—not a fruitful long-term theme—though ideal for automation.

Our emerging markets health care analyst prefers Indian drug makers like Glenmark Pharmaceuticals in Mumbai, which harness advanced technologies to create specialty drugs. In terms of more sophisticated innovations, India’s Biocon stands out as a frontrunner in biosimilars which are now disrupting the lifecycle of biologics.

China shifts into high gear

If China is becoming a dead end for off-patent biopharma brands, it’s building a superhighway for more innovative (and more expensive) medicines to reach its 1.4 billion consumers. To meet local demands, China has finally sped up its sluggish approval process for complex biotech therapies and biologics. In the past, companies waited an extra seven years before selling a new drug in China after launching them in western markets, due to hurdles like rerunning medical trials. In 2017, Beijing scrapped its rule to rerun trials for drugs already approved overseas and has increased its drug-approval staff eightfold since 2014.

Last December, China’s National Medical Products Administration (NMPA) approved an innovative new treatment for chronic kidney disease (CKD). What makes this notable is the approval comes well before the US FDA is expected to rule on the drug. Rather than trail behind the United States, China is turning the tables.
Roxadustat can now help half a million CKD patients in China who suffer from anemia during dialysis. Down the road, it may also be approved for China’s wider CKD population.

China’s fast-track approval of Roxadustat is great news for Astra, which sells the drug in China, and for San Francisco-based FibroGen, the drug’s inventor. Previously, Astra has twice benefitted from NMPA’s rapid approvals, receiving green lights for its Lynparza and Tagrisso cancer therapies. Astra’s strong marketing presence in China, however, isn’t accidental.

In 2015, Astra committed US$150 million to cement its strategic alliance with the Chinese research and drug manufacturer Wuxi AppTec. In March this year, in a ceremony with Sweden’s BioVentureHub and the UK Bioindustry Association, Astra became the founding partner to a new life sciences research hub in the high-tech district of Wuxi, just west of Shanghai.

For Astra, investing in China has clearly paid off. All in, China is now Astra’s second biggest market by sales after the United States, and critical for Astra’s future growth.

Biologic sticker shock  
China is a boon for older biologics like Roche’s cancer treatment Rituxan. China’s government, however, isn’t happy with Rituxan’s sky-high price tag. This May, China’s Fosun Pharma started marketing a cheaper version of Rituxan, the first NMPA-approved biosimilar made in China. With more than 200 biosimilars in clinical trials, China has more biosimilars in its pipeline than any other country in the world.14

Biologic “sticker shock” isn’t unique to China. It’s a global phenomenon that varies by country and is currently most acute among US consumers. Consider the world’s best-selling drug, Humira. A year-long supply costs US$40,000 in the United States, higher than anywhere else in the world. Depending on insurance plans, co-pays for a single refill may cost as little as US$50 or as much as US$1,300.

Europeans, however, aren’t suffering from biologic price fatigue the same way these days. Why? Europe has eclipsed the United States (and China for that matter) in its uptake of cheaper biosimilars, as shown in Exhibit 5. In Europe, the European Medicines Agency approved its first biosimilar in 2006, and currently has more than 40 biosimilars approved for use.15 The US FDA approved its first biosimilar in 2015. As of last summer, only four biosimilars were sold in the United States, and they didn’t make a dent in US biologic prices.16

Anticompetitive behavior  
To understand why the United States trails Europe in biosimilar uptake, let’s look at Johnson & Johnson’s blockbuster Remicade, which treats conditions like arthritis largely the way Humira does. After Europe approved two Remicade biosimilars (Celltrion’s Inflectra in 2013 and Samsung Bioepis’ Flixabi in 2015), Remicade lost more than 50% of its European market share—a cliff-like drop. Those biosimilars also helped drive down Remicade’s prices across Europe by 30–50%. Better to help product fly off the shelf with lower prices than not at all. At a more palatable price point, Europeans are taking Remicade or biosimilar equivalents at higher frequencies—it appears doctors in countries like Hungary had been rationing Remicade doses because of the price.

Remicade’s US prices and sales haven’t seen the same declines partly because of a US rebate system that favors biologic incumbents over biosimilars. Johnson & Johnson, for example, froze out Celltrion’s biosimilar in the United States by offering price rebates and other incentives to healthcare providers.
Manufacturing biosimilars

Making biologics and their biosimilar equivalents is a technically challenging and expensive exercise—as we explained in “How scientists make biologics.” It takes 8–10 years and US$100–US$200 million to replicate and market a biosimilar, compared to 3–5 years and US$1 million–US$5 million for a small-molecule generic drug.17

Some companies that invent and manufacture biologics, like Amgen and Novartis, also make and sell biosimilars. It’s a business strategy that could be described as, “if you can’t beat them, join them.” Consider Amgen’s blockbuster biologic, Enbrel, which treats moderate-to-severe rheumatoid arthritis. It’s in the same class as Humira and Remicade and is seeing declining European sales from biosimilar competition. At the same time, Amgen is targeting Remicade and Humira with its own biosimilars.

Other biopharma firms like Roche have outsourced biologic production to firms like Samsung Biologics in South Korea. As the world’s largest biologic contract manufacturer, Samsung Biologics gives firms like Bristol-Myers Squibb low-cost production with superior quality. Having cut their teeth on biologic production, both Samsung Biologic and Celltrion are transitioning into more creative innovators with biosimilar production.

Celltrion, for example, has developed a new biosimilar version of Remicade that is injected under the skin. The original Remicade is injected intravenously, requiring costly office visits to a doctor. Self-administering Celltrion’s version will be cheaper and more convenient.

In China, they call this the “me-too-and-better” approach to replication. Rather than produce an exact “me-too” copy, offering a “me-too-and-better” formulation can increase sales. It might also skirt patent protections on the original drug.

The circle of life

The pace of change and competition in the biopharma industry has always been fast. Firms like Pfizer and MSD who orchestrated mega mergers in 2009, did so partly to move into much sought-after biologic medicines. Now, more than a decade later, the biopharma industry finds itself at a familiar tipping point. As patent expirations and biosimilars encroach on revenues, it’s up to scientists (as always) to churn out new therapeutic treatments at premium prices that can help biopharma CEOs maintain strong revenue growth.

Endnotes

7. Source: Staton, T. “AstraZeneca, Merck team up on Lynparza combos in collaboration worth up to $8.5B,” FiercePharma, 27 July 2017.
Franklin Templeton Thinks: Equity Markets highlights the global views our equity investment teams have across developed and emerging economies, sectors and individual companies. Each quarterly issue spotlights fresh insights that our analysts and portfolio managers bring to active security research, examining risks and opportunities from both growth and value frameworks.

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What are the risks?

All investments involve risks, including possible loss of principal. Stock prices fluctuate, sometimes rapidly and dramatically, due to factors affecting individual companies, particular industries or sectors, or general market conditions. Special risks are associated with foreign investing, including currency fluctuations, economic instability and political developments. Investments in emerging markets involve heightened risks related to the same factors, in addition to those associated with these markets’ smaller size and lesser liquidity. Investments in fast-growing industries like the technology sector (which historically has been volatile) could result in increased price fluctuation, especially over the short term, due to the rapid pace of product change and development and changes in government regulation of companies emphasizing scientific or technological advancement or regulatory approval for new drugs and medical instruments.