

THE LIFE SCIENCES REPORT

10 Reasons Why Health Care Start-Ups Fail

By Paul Grand and Kathryn Zavala,
MedTech Innovator

In our roles at MedTech Innovator, a global accelerator for medtech start-ups, we've worked with thousands of early-stage health care companies in cities around the world. We're proud to play a role in helping new companies get their innovative technologies to the patients who need them.

But we've seen a lot of failed efforts, too.

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A Conversation with Matthew J. Meyer, Chief Client Corporate Development Officer at Wilson Sonsini

Attorneys Vern Norviel and Charles Andres recently sat down with Wilson Sonsini Chief Client Corporate Development Officer Matthew J. Meyer to discuss his role at the firm. With broad experience in a variety of senior management positions within the life sciences sector, Matt has a successful track record of leading companies. He supports the firm's clients by providing insights and practical strategic business advice, developing and implementing partnering or other transactional strategies to accelerate growth, counseling clients on optimizing their business models, and supporting their fundraising efforts.

A licensed attorney, Matt spent the first half-decade of his career as a corporate transactional lawyer with Pfizer in New York before transitioning into business and general counsel positions with public and private companies in Europe and the U.S. He has served on the management teams of four start-ups in the biotech, diagnostics, and digital health sectors, and helped these companies raise private and public capital, develop and execute successful partnerships, and exit through IPOs or acquisitions. Matt joined the firm in June 2019 and is based in the San Francisco office.

Why did you join Wilson Sonsini?

Matt: Wilson Sonsini was outside counsel to my first start-up in the digital health sector in the early 2000s. From my first interactions with the firm, I was

impressed by its capabilities to efficiently support the needs of small companies with top-tier legal counsel. The company, VC-backed RxCentric, was sold to Allscripts and was based in New York. While the firm didn't have an office in the city at the time, the attorneys bridged the geographic gap seamlessly and provided creative and business-minded legal advice.



When senior members of Wilson Sonsini's corporate and IP life sciences practice pitched me on the idea of joining the firm and building out a business advisory practice, such a creative idea didn't surprise me. It was the firm being true to one of its values: supporting innovation. I saw the posting as an opportunity to work with top-tier, creative, and business-minded attorneys to build out a novel, highly differentiated, yet complementary facet of the firm to assist its life sciences clients in need of more dedicated business support.

Could you describe the business advisory practice and its benefit to clients?

In a nutshell, the practice is designed to provide practical business counsel based on real-world perspectives and experience to enable clients to be successful with their business objectives.

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A Conversation with Matthew J. Meyer . . . (Continued from page 1)

Whether it's helping develop a winning pitch for a venture capital fundraising or reviewing a company's platform technology to assess where it may be best out-licensed, our group attempts to provide specific insights and guidance. Because this counsel is typically delivered alongside my legal colleagues, there is a natural synergy that can streamline transactions. For example, if I am helping a company with the business aspects of its fundraising, it's easy for me to interface with the corporate legal folks who may be handling the IP diligence or negotiating the definitive investment agreement.

What is the geographic scope of the practice?

Consistent with the broad reach of the firm, it's national and in some instances international, as we are working with companies in the UK, Germany, and Asia.

How does your background set you up for success in your exciting new role?

As mentioned, I have had a varied and unusual career to date, in which I've worked for a wide range of companies in the U.S. and Europe. My goal is to bring my learnings to the business advisory practice. I started as a corporate attorney with one of the largest corporations in the world, Pfizer, where I gained valuable insights into how a big company operates and "thinks," while also gaining a good understanding of how the pharmaceutical industry works. Thereafter, my tenure on management teams at both very small, more emerging growth private companies and public companies taught me a lot about how these companies grow, establish, and evolve their cultures and tackle the myriad challenges—both expected and unexpected—that come their way on a nearly daily basis. As importantly, I gained a lot of insight around how big companies like Pfizer view their smaller industry peers, and learned how and what small companies should do to

ensure a higher likelihood of success when interfacing with and ultimately hoping to transact with the bigger ones.

Can you share some examples of how you've been able to help companies with their business needs?

One of the nice aspects of my practice is that I work with a diversity of highly talented scientists and business people across a broad range of companies, each of which has different needs.

On the commercial strategy side, for example, I developed a go-to-market plan for a private company in the transfusion medicine sector with a novel business model to address the increasing shortages of blood components now facing the U.S. As a result, the client was able to establish a compelling value proposition to the hospital system, one that ultimately attracted some of the major academic medical centers across the country. This led to the signing of its first commercial contract.

On the therapeutics front, I worked with a group of founders to develop and execute a strategy to out-license an oncology treatment platform from a major academic medical center. Part of the effort involved developing a compelling business plan to convince the institution that the company would have the capabilities to succeed, as well as managing the licensing process and structuring the company's operating plan. In this role, I worked closely with my corporate, IP, and licensing colleagues, all of whom were critical to the company's success.

How has funding changed in the current COVID landscape?

The pandemic is further highlighting the critical role that therapies, vaccines, and diagnostics play in our society. Ultimately, I believe a combination of these are what will allow our global society to more fully emerge from this unprecedented healthcare crisis. As a

result, many life sciences sectors remain relatively healthy, especially more established companies that are either public or planning to go public. In fact, IPO activity in the life sciences industry has been relatively healthy since March. With that said, many venture investors are taking a more cautious approach.

What general advice would you give to companies seeking funding in this unusual economic environment?

First, remember that most fundraising processes are challenging and it is the exception and not the rule for companies to get funded quickly and at their desired valuations, even in a strong market. Second, be thoughtful about your ask and consider raising only what you absolutely need to get to the next critical milestone for your business. Investors should appreciate this, and you may not have the luxury of raising as much as you originally desired. Finally, now more than ever, your pitch and value proposition should be crystal clear. Specifically, be sure you set out in the first minutes of your pitch why your product or technology will address a critical unmet need, how it's different from the rest, and how it will make money for the investor.

How do you see your position evolving?

If we are successful, this practice will help our clients be successful with business challenges. I'm pleased to report that in the short time since my practice started here, we are seeing examples of that, some of which I've mentioned. If this continues, I expect the practice to grow steadily with the addition of other business professionals to support the growth in client demand. These additions will likely be based in strategic life sciences hubs across the country, including the Northeast, to complement my home base in San Francisco.

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10 Reasons Why Health Care Start-Ups Fail *(Continued from page 1)*

Grounded in science and regulated by the government, health care is a challenging sector. In the life of any start-up, there are plenty of opportunities for missteps. And pivoting isn't as easy as it is for companies developing tech solutions, like a photo-sharing app. Mistakes in a health care start-up can be fatal.

But that doesn't mean your company has to make one.

Knowing the most frequent mistakes is the first step to avoiding them. With that in mind, here are 10 of the most common problems we've seen that can cause a health care start-up to fail and some tips to solve them.

Failure to Properly Articulate Your Value Proposition

The value proposition is the new elevator pitch. Too many companies in health care describe themselves as “better, faster, cheaper” than what's already on the market, and their pitch ends there.

But that isn't enough. How is your solution better? How much faster? How much cheaper than the standard of care? You must be prepared to communicate your unique value proposition from all angles, and you need to understand the health care economics for each stakeholder. Take the time early on to define the standard of care for each of your possible stakeholders and then quantitatively explain how your product improves upon it.

Not Having an End-to-End Evidence Generation Strategy

Health care companies are required to amass specific evidence and data to achieve key milestones such as raising capital, obtaining regulatory clearance or approval, and obtaining insurance reimbursement or payment. A common mistake is thinking about evidence generation in a linear manner and

focusing just on what is needed for the next milestone. This is a common and costly error that can significantly delay time to success.

Far too many start-ups succeed in achieving a regulatory milestone but then run out of funding before generating sufficient evidence to convince customers to buy their products. To avoid this, start conversations early with all relevant stakeholders about what data they will require. Also consider the Food and Drug Administration's innovative [Payor Communication Task Force](#), which involves public and private payers such as Medicare and Medicaid, private health plans, health technology assessment groups, and others in the pre-submission process as well as [parallel review](#) with the Centers for Medicare and Medicaid Services to potentially shorten the time between FDA approval or clearance and coverage decisions.

It's never too early to have these conversations.

Choosing the Wrong CEO

The CEO is the face of a company, so it's critically important to have the right person in this role. Investors know that start-ups need the right CEO at the right time. It's OK to have a somewhat inexperienced founder as a CEO, as long as she or he has the general qualities that investors respect.

Common ways to tell if you need to replace the CEO—even with an acting CEO—include overconfidence, dismissiveness, arrogance, and a lack of transparency about important details. If your CEO checks any of those boxes, now is the time to make that change, because investors back people, not technology. You might also consider if it's possible that your current CEO would be more effective in a different position.

Staying in Stealth Too Long

To be successful, a company needs to be talking to investors, customers, health care providers, patients, and potential acquirers early and often. Stakeholder input is needed early to avoid mistakes that can kill a company down the road.

Staying off the radar also carries exit risks. Acquisitions tend to happen in groups, because larger companies are competitive. If a rival buys a certain technology, a large player, such as a public company, might want to acquire something similar—and soon. They track and build relationships with companies in their landscapes of interest, and when there is urgency, they move quickly. A company that is in stealth mode too long could easily miss the window of opportunity.

As soon as your intellectual property is protected, start talking to the relevant stakeholders. Delaying these conversations is the one mistake that can lead to many of the other mistakes on this list.

Thinking the Direct-to-Consumer Model Will Make Life Easier

Many health care start-ups develop a strategy that will let them sell straight to consumers so they can skip regulatory approval, which can be time consuming, labor intensive, and expensive. Angel investors with small pockets tend to favor this strategy. The problem is that this relies on the often-flawed assumption that consumers are willing to pay out of pocket for health-related products and services.

Beyond the super-early adopters, though, consumers want their health plans to pay. As a result, consumer health start-ups often wind up pivoting to pursue a regulated device strategy, but many run out of cash before they get there. Do your homework on this one, and come to an

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informed decision on whether your start-up will do better as a regulated product.

Choosing the Wrong Initial Indication

We regularly see start-ups whose technology has multiple potential indications. They typically choose the initial indication based on the one the company founder knows the most about—a founder who is a liver cancer surgeon, for example, choosing liver cancer over breast cancer. But this isn't always the right call, and the evidence generated in the wrong initial indication can drain resources before you have time to pivot.

To find the best indication, do a value proposition analysis on all possible indications and choose the one that's the most compelling in terms of market size, competitive landscape, and patient adoption. These should inform the decision on which indication to initially pursue.

Product Doesn't Fit into Existing Workflows

Can you disrupt an industry without disrupting people who have important work to do? This is a vital question. You may think your technology will be adopted because of the potential for improved patient outcomes or lowering overall costs, but if it adds steps or changes a procedure, you're interrupting people—and they don't like that.

New technology should fit as seamlessly as possible into existing workflows, not delay or interrupt them.

That's why it is essential to learn every step and every aspect of a customer's workflow and every person who will be affected by it. A surgeon might love your technology, but if it adds too much work for nurses or technicians, an adoption hurdle looms. Conduct discovery, focus groups, and user testing with everyone in the workflow and in as many environments as possible.

Misunderstanding the Payment and Reimbursement Dynamic

It's important to know who will be paying for the product and to know how much of the reimbursement will go to it. Misunderstanding the complicated economics of payment is a deadly and easy one to make.

All too often, we hear people pitch us a product and assume they will be able to get the full amount of the payment for the relevant reimbursement code(s). But it's usually more likely that one-third of the reimbursement will go to the product. Pricing a product without doing the necessary homework on the cost of goods and the reimbursement and payment dynamic can doom a company to failure. There are no shortcuts when it comes to understanding the economics of providers, payers, and other customers.

Putting Too Much Money and Effort into Pilot Programs

Pilot programs are important for early-stage companies, but there's no guarantee that any given pilot will turn into a commercially profitable relationship. It is woefully common to underestimate the amount of effort it will take to achieve a successful pilot. For a start-up with a handful of employees, even a single pilot can take up the attention of the entire team.

That's why it is important for companies to put the right amount of resources into these programs, but not go overboard on them. A key way to know how much time, effort, and money to expend is to discuss the terms of a post-pilot contract with a potential customer. To help a pilot generate traction and revenue, ask the testers what key performance indicators they will use when evaluating whether to convert a pilot to a contract. Also ask for statistics on how many of the customer's past pilots resulted in contracts. Getting answers to these questions will help you

allocate the right amount of effort and be choosy about your pilot partners.

Staying in Your Echo Chamber

A start-up's goal should be to create a new advancement that will help people all over the world, not just those in the company's inner circle. That's why input from leaders and stakeholders who are outside the ecosystem is essential. Relying entirely on local key opinion leaders and the immediate networks of the company's founders risks making wrong assumptions about the need and potential uses for the technology.

Local support systems also tend to give plenty of applause and pats on the back, but avoid giving start-ups honest feedback for fear. Get on the road, get out of the echo chamber, and solicit honest input from as broad an ecosystem as possible.

Developing medical advancements is a time- and labor-intensive process. Making the wrong call can mean long delays and escalating costs. But just because many companies make mistakes doesn't mean yours has to.

There are no shortcuts, and there's no substitute for buckling down and learning as much as you can about your market, your competition, and the needs of your customers and potential acquirers.

Paul Grand is the founder and CEO of MedTech Innovator (<https://medtechinnovator.org>), a nonprofit global competition and accelerator for medical device, digital health, and diagnostic companies. Kathryn Zavala is the company's vice president for operations and business development. Together they have evaluated more than 12,000 start-ups. Contact Paul at paul@medtechinnovator.org and Kathryn at kathryn@medtechinnovator.org.

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Wilson Sonsini Clients on the Front Lines of the COVID-19 Pandemic

We at Wilson Sonsini have never been more proud of our work with innovative life sciences companies, many of which are currently working to address challenges associated with COVID-19. There are examples from numerous sectors—including biotech, digital health, medical devices, and pharmaceuticals—from companies developing and testing treatments and prospective vaccines to those involved in manufacturing personal protective equipment, medical supplies, or other key components needed to care for those experiencing illness.

Below is a sampling of recent COVID-19-related client activity in which our firm has been involved:

- **Atossa Therapeutics** announced two programs to develop therapies for the treatment of COVID-19: one called the COVID-19 HOPE Program, which uses a novel combination of drugs for severely ill patients to improve lung function and reduce the amount of time that COVID-19 patients are on ventilators, and another for at-home treatment immediately following diagnosis of COVID-19 to proactively reduce symptoms of COVID-19 and to slow the infection rate, enabling that person's immune system to more effectively fight the virus. The firm is patent counsel to Atossa and is working with the company on the IP strategy to cover its COVID technologies.
- **CalciMedica Inc.**, a clinical-stage biotechnology company targeting calcium release-activated calcium (CRAC) channels for the treatment of acute and severe inflammatory diseases, announced that it has raised \$15 million in a Series C financing round to support ongoing clinical trials in patients with COVID-19 pneumonia and commercial manufacturing of Auxora, the company's lead drug candidate. The firm represented CalciMedica in the transaction.
- In addition, the firm helped CalciMedica earn FDA approval to continue to study the use of Auxora in patients with severe COVID-19 pneumonia who are at risk for progression of acute respiratory distress syndrome. Our team was also instrumental in obtaining FDA approval of the Investigational New Drug application.
- A group of companies has joined forces in the war on COVID-19 to form **The Canadian COVID Coalition**. The Coalition has volunteered its time and resources to identify the nanobodies—special antibodies found only in llamas and sharks—that are activated in the immune response against COVID-19. With initial testing complete, the Coalition plans to publish its first results shortly, with additional results to follow. The publications will be provided publicly in a unique “open source biology” model to allow researchers from around the world to quickly access the data for research purposes. The Coalition is committed to ensuring that treatments or tests stemming from their research can reach financially vulnerable populations. The firm is advising the Coalition on IP strategy to ensure that the resulting products are accessible to all countries around the world.
- **ChromaCode, Inc.**, a company redefining molecular testing through data science, announced a \$10 million Series C extension with an investment from Adjuvant Capital, which brings the company's total Series C funding to \$38 million. Funding from the round will support global expansion and continued development of ChromaCode's high-definition PCR platform (HDPCR™), through which the company recently launched a high-throughput SARS-CoV-2 Assay. The firm represented ChromaCode in the transaction.
- **CorVent Medical**, a Coridea portfolio company, announced the closing of a \$4.5 million seed financing round to support the commercialization of the first single-use, critical care ventilator that will enable rapid and affordable deployment with superior infection control. The funds will be used to finalize regulatory filings under the FDA's Emergency Use Authorization Act, to upon approval launch the CorVent™ Single-Use Ventilator, and to support future development of next-generation lifesaving devices for respiratory insufficiency. The firm represented CorVent Medical in the transaction.
- The firm is working on a number of matters for **Curative**, a company that was founded earlier this year to develop tests for sepsis. In March, Curative pivoted to COVID-19 to address the urgent need for test development and production in the U.S. The company developed a simple oral fluid swab test that is self-administered by the patient, eliminating the need for

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Wilson Sonsini Clients on the Front Lines of the COVID-19 Pandemic *(Continued from page 5)*

PPE or a healthcare worker. Their testing capabilities allow them to receive swabs and return results in about 24 hours. The company has processed 650,000 tests to date and is averaging 25,000 tests per day. Curative is operating out of its CLIA-certified facilities in Los Angeles and Washington, D.C., to process its FDA-authorized tests.

- **Everlywell**, a digital health company that offers access to at-home collection lab tests for cholesterol, diabetes, STIs, hormones, and more, received an Emergency Use Authorization (EUA) from the FDA for a COVID-19 at-home collection kit. Everlywell's EUA is the first to be issued to a digital health company such as Everlywell, which connects people and organizations with laboratory testing and is not a laboratory or diagnostics manufacturer. It is also the only EUA for at-home collection COVID-19 testing that is not tied to one specific lab and allows the company to work with a number of certified labs offering several authorized tests. The firm is representing Everlywell in

drafting and negotiating commercial agreements with employers and other third parties to help those parties provide access to the at-home tests for their employees using Everlywell's platform.

- **Gauss Surgical**, a leading developer of digital decision-support tools for the medical frontlines, partnered with Evive, a leader in enterprise communications and benefits engagement, to launch Apollo, a free Apple iOS and web app to help increase the safety and efficiency of drive-through COVID-19 screening and testing for patients and health workers. The app will also facilitate Stanford Medicine's Apollo COVID-19 Screening Survey. The firm represented Gauss in the transaction.
- Just weeks after **Mammoth Biosciences** announced that its proprietary CRISPR-based diagnostics test for COVID-19 had a high degree of specificity even for asymptomatic patients, Mammoth struck a deal with GlaxoSmithKline Consumer Healthcare to accelerate development of the test in hopes of

getting it to healthcare providers and consumers as soon as possible. The two companies hope to begin seeking an Emergency Use Authorization from the FDA for the test by the end of the year. The firm assisted Mammoth Biosciences in the transaction.

- **Octant**, a synthetic biology drug discovery company designing small-molecule, multi-target drug leads for multifactorial diseases, announced that it has raised \$30 million in a Series A financing led by Andreessen Horowitz. Octant is using the proceeds to further develop its discovery platform, which targets large numbers of G protein-coupled receptors (GPCRs) and their downstream signaling pathways to engineer drugs to treat complex diseases. The company is responding to the global call for collaboration by open sourcing part of its platform under the Open COVID Pledge for use in the COVID-19 pandemic. The firm represented Octant in corporate and patent matters related to the transaction and has served as an advisor to the company since its inception as a spinout from UCLA.

Wilson Sonsini Supports UCSF Health Hub in Launch of Volunteer Patriots Program, Accelerating COVID-19 Solutions

On April 1, 2020, UC San Francisco's [Health Hub](#), a nonprofit innovation hub and start-up studio supporting the next wave of digital health entrepreneurs, announced the launch of the UCSF Volunteer Patriots Program, a unique effort that will help UCSF build high-impact internal solutions to respond to COVID-19 by bringing together the best talent from Silicon Valley, the UCSF ecosystem, and the Health Hub community. Wilson Sonsini is serving as a legal resource to and sponsor of the program.

The program was launched with three critical projects: building a staff scheduling solution for COVID-19 screening; developing multi-language COVID-19 education content for non-English speaking patients that can be distributed digitally; and creating a prioritization/triaging solution for rescheduling patients whose elective procedures have been deferred because of the outbreak. New projects identified by UCSF will be added periodically.

The Wilson Sonsini team providing legal resources to the program includes partners Ali Alemozafar and James Huie, who both serve on the board of UCSF Health Hub. To learn more about the program, visit <https://www.ucsfvolunteerpatriots.com/>.

FDA Issues MAPP on Conversion of ANDA Approval to Tentative Approval

By David Hoffmeister and Charles Andres

Introduction

When a generic drug manufacturer seeks approval for an abbreviated new drug application, or ANDA, the timing of ANDA approval depends in part on patent and regulatory exclusivity protection for the reference listed drug, or RLD. Although patent and regulatory exclusivities can run concurrently, they are separate forms of intellectual property.

Both patents and regulatory exclusivities have individual expiration dates, but they differ in that patents can be challenged in a federal district court or in the Patent Office, while regulatory exclusivities, with some rarer exceptions (e.g., for orphan drugs), are not generally open to challenge or workaround (Section viii carve-outs).

The Hatch-Waxman Act provides a framework for ANDA (generic drug) applicants to challenge timely Orange Book-listed patents that contain claims covering the approved drug, formulation, and methods of treatment employing these. Within the Hatch-Waxman framework, ANDA applicants must provide a certification that each Orange Book-listed patent has expired (a paragraph II certification); that the ANDA applicant will not come to market until the patent(s) have expired (a paragraph III certification); or that the patent(s) are unenforceable, will not be infringed, or are invalid (a paragraph IV certification). Paragraph IV certifications set the stage for challenging timely Orange Book-listed patents.

Once the FDA agrees to review the ANDA, an ANDA applicant who has

submitted a paragraph IV certification must provide timely notice of the paragraph IV certification to the new drug application (NDA) holder and each patent owner. The notice must include a description of the legal and factual basis for the paragraph IV certification that the patent(s) are invalid, unenforceable, or not infringed. If the NDA holder or patent owner, responsive to this notice, timely initiates a patent infringement suit against the ANDA applicant, the U.S. Food and Drug Administration's (FDA's) approval of the ANDA will generally be stayed for 30 months. The 30-month stay runs from the later of the date of receipt of the notice by the NDA holder or patent owner or such longer or shorter time as a court might order. Importantly, by some estimates, the average length of an ANDA litigation runs about 38 months, which means the ANDA may be ready for approval—and the 30-month stay may run—before the patent litigation is finished.

Thus, the FDA may issue final ANDA approval at the conclusion of the 30-month stay if: the suit is still pending, the ANDA does not contain any paragraph III certifications, the ANDA is not blocked by any unexpired exclusivities, and all other requirements (e.g., a showing of bioequivalence, which is sometimes misunderstood; see also here) are met. In some cases, however, after the ANDA is approved, the NDA holder or patent owner may be successful in its patent infringement lawsuit. In these cases, a federal district court may order that the patent(s) are infringed and that ANDA approval is not effective before the expiration of the infringed patent(s). Such a situation may necessitate that the FDA make a change in the approved status of the ANDA.

An ANDA must be approved before a generic drug can be marketed in the U.S. Tentative approval is not the same as approval, and tentatively approved ANDA drugs cannot be marketed in the United States.

MAPP Outlines the FDA's Multi-Office Procedure

The FDA recently posted MAPP 5220.2, which outlines the process that the agency employs when deciding whether to make a change in status for an approved ANDA—that is, in deciding whether to convert the ANDA approval to a tentative approval. The ANDA status is important. An ANDA must be approved before a generic drug can be marketed in the United States. Tentative approval is not the same as approval, and tentatively approved ANDA drugs cannot be marketed in the United States. The FDA's MAPPs outline, or “map,” internal FDA policies and procedures.

When the FDA has approved an ANDA and a federal district court subsequently issues an order that timely Orange Book-listed patent(s) are valid and infringed, the FDA must determine whether it is appropriate to convert the ANDA's status from approved to tentatively approved, as well as the timing of the conversion. To help the FDA make these determinations, ANDA applicants are required to submit any and all documents related to the court's

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FDA Issues MAPP on Conversion of ANDA Approval to Tentative Approval *(Continued from page 7)*

determination within 14 days of the date of entry by the court, the date of appeal, or the expiration of the time for appeal. A list of required submissions can be found [here](#).

According to the MAPP, the FDA considers several factors when determining whether it is appropriate

A change of ANDA status from approved to tentatively approved happens only after several layers of FDA review, and these take time. Thus, the change will not be instantaneous upon issuance of the federal district court order.

to convert an ANDA with approved status to tentatively approved status. For example, in addition to considering the district court judgment that the patent(s) are valid and infringed, the FDA will consider any documents showing that the district court judgment has been stayed, or that there is a pending motion for stay of the district court judgment.

The MAPP walks through the agency's decision-making process, which involves multiple layers of review, starting at the team level and proceeding to the director level. At the start of the review process, the Office of Generic Drug

Policy Patent and Exclusivity Team (the Team) receives information concerning the patent infringement lawsuit. The Team then verifies that the patents-in-suit are Orange Book-listed, and then assesses court order(s) and motion(s) for stay of the order(s) to determine whether conversion of ANDA status from approved to tentatively approved may be appropriate.

The Team then notifies the Deputy Director of the Office of Generic Drug Policy Division of Legal and Regulatory Support (OGDP DLRS) about the status of the lawsuit, provides a recommendation, and, where appropriate, drafts "Conversion to ANDA Tentative Approval" letters. The OGDP DLRS Deputy Director (or designee) then reviews the assessment and the "Conversion to ANDA Tentative Approval" letter. Afterward, the DLRS Director (or designee) performs a secondary review of the "Conversion to ANDA Tentative Approval" letter.

At that point, the Office of Regulatory Operations Division of Project Management (ORO), among other things, issues the "Conversion to ANDA Tentative Approval" letter, updates the ANDA status to tentative approval, and notifies the Orange Book staff of the conversion. The ORO Immediate office then provides final signature to the "Conversion to ANDA Tentative Approval" letter.

Conclusion

There are several takeaways from the MAPP. First, a change of ANDA status from approved to tentatively approved

happens only after several layers of FDA review, and these take time. Thus, the change will not be instantaneous upon issuance of the federal district court order. Second, a well-crafted, pending motion for a stay of the district court judgment can halt or delay the conversion process. As such, ANDA applicants, as well as NDA holders and patent owners, should give an appropriate level of thought to preparing and responding to these motions. Finally, if the FDA converts an approved ANDA to tentatively approved status, this tentative approval does not allow the generic drug to be marketed in the United States. Thus, any ANDA that is converted to tentative approval status must subsequently obtain an approval letter from the FDA before going to market. Accordingly, the MAPP process can be employed by branded drug manufacturers to delay market entry of a generic drug. And conversely, generic drug applicants should take reasonable measures, where appropriate, to halt or delay the process.



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Life Sciences Venture Financings for Wilson Sonsini Clients

By Scott Murano

The table below includes data from life sciences transactions in which Wilson Sonsini Goodrich & Rosati clients participated during the first and second halves of 2019. Specifically, the table compares—by industry segment—the number of closings, the total amount raised, and the average amount raised per closing across the two six-month periods.

Life Sciences Industry Segment	1H 2019	1H 2019	1H 2019	2H 2019	2H 2019	2H 2019
	Number of Closings	Total Amount Raised (\$M)	Average Amount Raised (\$M)	Number of Closings	Total Amount Raised (\$M)	Average Amount Raised (\$M)
Biopharmaceuticals	44	\$1,203.07	\$27.34	42	\$770.62	\$18.35
Genomics	7	\$59.88	\$8.55	9	\$81.96	\$9.11
Diagnostics	10	\$140.53	\$14.05	13	\$183.98	\$14.15
Medical Devices & Equipment	50	\$591.04	\$11.82	39	\$308.92	\$7.92
Health IT	14	\$160.59	\$11.47	18	\$180.02	\$10.00
Healthcare Services	19	\$197.92	\$10.42	15	\$465.01	\$31.00
Total	144	\$2,353.03		136	\$1,990.50	

The data demonstrates that venture financing activity decreased from the first half of 2019 to the second half of 2019 with respect to the total number of closings and the total amount raised. Specifically, the total number of closings across all industry segments decreased 5.6 percent, from 144 to 136, and the total amount raised across all industry segments decreased 15.4 percent, from \$2,353.03 million to \$1,990.50 million.

Notably, the two largest industry segments during the first half of 2019—medical devices and equipment and biopharmaceuticals—experienced both a decrease in number of closings and in total amount raised between the first and second halves of 2019. Specifically, the number of closings in the largest industry segment—medical devices and equipment—decreased 22 percent, from 50 to 39, while the total amount raised in medical devices and equipment decreased 47.7 percent, from \$591.04 million to \$308.92 million. Similarly, the

From the first half of 2019 to the second half of 2019, the total number of closings across all industry segments decreased 5.6 percent and the total amount raised decreased 15.4 percent

number of closings in the second-largest industry segment—biopharmaceuticals—decreased 4.5 percent, from 44 to 42, while the total amount raised in biopharmaceuticals decreased 35.9 percent, from \$1,203.07 million to \$770.62 million. In contrast, the third-largest industry segment—healthcare services—experienced a decrease in number of closings, but an increase in total amount raised: the total number

of closings decreased 21.1 percent, from 19 to 15, while the total amount raised increased 134.9 percent, from \$197.92 million to \$465.01 million.

The remaining three industry segments fared better. The number of closings in the fourth-largest industry segment—health IT—increased 28.6 percent, from 14 to 18, while the total amount raised increased 12.1 percent, from \$160.59 million to \$180.02 million. The number of closings in the fifth-largest industry segment—diagnostics—increased 30 percent, from 10 to 13, while the total amount raised increased 30.9 percent, from \$140.53 million to \$183.98 million. The number of closings in the smallest industry segment—genomics—increased 28.6 percent, from 7 to 9, while the total amount raised increased 36.9 percent, from \$59.88 million to \$81.96 million.

In addition, our data suggests that Series A (including Series Seed) financing activity and Series C financing activity,

Continued on page 10...

Life Sciences Venture Financings for Wilson Sonsini Clients *(Continued from page 9)*

Average pre-money valuations for life sciences companies increased from 1H 2019 to 2H 2019 for Series A (including Series Seed) financings, but decreased for Series B and Series C and later-stage financings

in each case as a percentage of all other financing activity, decreased from the first half of 2019 to the second half of 2019, while Series B financing activity and bridge financing activity as a percentage of all other financing activity increased across the same period. Specifically, the number of Series A (including Series Seed) closings decreased from 33.8 percent to 30.8 percent, the number of Series B closings increased from 12.8 percent to 15.4 percent, and the number of Series C and later-stage closings decreased from 16.2 percent to 15.4 percent. Bridge financing activity decreased from 24.3 percent to 21.7 percent over the same period, while recapitalization and other non-traditional financing activity increased from 12.9 percent to 16.8 percent.

Average pre-money valuations for life sciences companies increased from the first half of 2019 to the second half of 2019 for Series A (including Series Seed) financings, but decreased over the same

period for Series B and Series C and later-stage financings. The average pre-money valuation for Series A (including Series Seed) financings increased 18.3 percent, from \$12.11 million to \$14.32 million; the average pre-money valuation for Series B financings decreased 8.8 percent, from \$78.74 million to \$71.81 million; and the average pre-money valuation for Series C and later-stage financings decreased 23.9 percent, from \$281.50 million to \$214.31 million.

Other data taken from transactions in which all firm clients participated in the second half of 2019 suggests that life sciences is now tied with software as the most active industry for investment among our clients, as measured by total amount raised. For the second half of 2019, life sciences and software both represented 30 percent of total funds raised by our clients. In contrast, in the first half of 2019, life sciences accounted for 24 percent of total funds raised, while software accounted for 50 percent of total funds raised.

Overall, the data indicates that access to venture capital for the life sciences industry decreased in the second half of 2019 compared to the first half of 2019, representing the end of a growth trend experienced over the two prior six-month measurement periods. Against that backdrop of decreased macro-level financing activity, it was notable that bridge financing and other non-traditional financing activity as a percentage of all other financing activity significantly increased during

the second half of 2019, suggesting that companies may be working out creative short-term financing arrangements in lieu of closing more traditional financing rounds in order to weather

It was notable that bridge financing and other non-traditional financing activity as a percentage of all other financing activity significantly increased during 2H 2019, suggesting that companies may be working out creative short-term financing arrangements to weather the storm

the storm. Unfortunately, in light of the COVID-19 outbreak and the ensuing decline in economic activity, rise in unemployment, and weakening of the financial markets, we expect to report a continued downward trend in venture financing activity over the first half of 2020 in our next issue.



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An Interview with Ryan Phelan: Using Biotechnology to Revive Endangered Species and Restore Damaged Ecosystems

COVID-19 Vaccines and the Harvesting, Bleeding, and Killing of Horseshoe Crabs

Wilson Sonsini attorneys Vern Norviel and Charles Andres recently sat down with Ryan Phelan of [Revive & Restore](#) (R&R). R&R is using 21st century biotechnology (including genomics, high throughput sequencing, and synthetic biology) to address urgent conservation challenges.

One issue that is particularly pressing is the harvesting and bleeding of horseshoe crabs, a threatened keystone species and the source of limulus ameobocyte lysate (LAL). LAL, obtained from the blood of horseshoe crabs, is employed in pharmaceutical manufacturing to test human and animal vaccines and drugs for the presence of bacterial endotoxins.

In essence, the crabs are harvested in the hundreds of thousands from the Atlantic coast, and then spend 24 to 48 hours being transported by boat to factories, where many of the crabs die in transit. The crabs that survive are impaled with a needle and bled in factory-like settings and drained of about one-third of their blood, as shown in the photo above.

After being industrially bled, the crabs are returned to the ocean, where many of them die and others fail to spawn. Because they are technically returned to the ocean, and because LAL is deemed a medical necessity, it is essentially a non-regulated industry.

The race to develop COVID-19 vaccines—and the anticipated production of billions of COVID-19 vaccine doses—highlights the need for making available to pharmaceutical companies a safe and scientifically proven LAL alternative



(Photo by Timothy Fadak/Corbis via Getty Images)

with minimal regulatory hurdles. Luckily, an alternative to LAL exists in the form of recombinant Factor C protein (rFC), which can be readily made in more than sufficient quantities to meet present and future pharmaceutical needs. A number of [peer-reviewed](#) scientific publications attest to the fact that rFC is a safe, effective, and viable alternative to LAL. For instance, Europe and China have adopted rFC as a LAL alternative.

Major pharmaceutical companies have embraced the so-called “[three R Framework](#)”:

- **Replace** the use of animals with alternative techniques, or avoid the use of animals altogether;
- **Reduce** the number of animals used to a minimum, to obtain information from fewer animals or more information from the same number of animals;
- **Refine** the way experiments are carried out, to make sure animals suffer as little as possible. This includes better housing and improvements to procedures that minimize pain and suffering and/or improve animal welfare.

rFC fits into the three R Framework. In addition, rFC de-risks supply chains that otherwise rely on harvesting

an endangered wild animal as their foundation.

Since January 1, pharmaceutical companies and environmental organizations were expecting the [United States Pharmacopeia \(USP\)](#) to name rFC as an LAL alternative, thereby making it easier for pharmaceutical manufacturers to employ rFC into their manufacturing processes. But on May 29, the USP did just the opposite, reversing an earlier decision to publish the equivalency endorsement. Instead, the USP said they will develop an entirely separate chapter in their guidelines—a process that is likely to take years. R&R seeks to have the USP change course and name rFC as an LAL alternative. With this as background, we introduce Ryan Phelan.



Ryan Phelan

(Photo credit: Christopher Michel)

Continued on page 12...

An Interview with Ryan Phelan . . . (Continued from page 11)

Ryan, please introduce yourself to our readers.

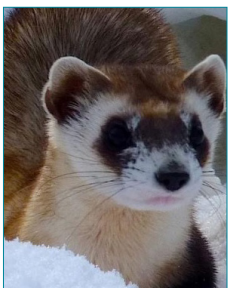
Hi, readers. I am a serial entrepreneur with two successful liquidity exits, including [DNA Direct](#). After the second exit, I decided to take a different course: using biotechnology to tackle unmet conservation challenges. To do this, I co-founded R&R, a 501(c)(3) foundation, a little over seven years ago. In essence, I wanted to take the 21st century scientific toolbox being developed for human medicine and apply it to pressing environmental problems.

Why name the foundation Revive & Restore?

Great question! We wanted to use state-of-the-art biotechnology to revive endangered species and restore their ecosystems. Hence, Revive & Restore.

Can you provide some examples of reviving and restoring?

Sure. One example is our [Black-footed Ferret \(BFF\) project](#), which we are conducting in conjunction with the United States Fish & Wildlife Service’s (USFWS’s) National Black-footed Ferret Conservation Center.



The Black-footed Ferret
(Photo credit: UCFWS)

BFFs are endangered and are indigenous to North American prairies. The USFWS has been doing a fantastic job breeding BFFs and reintroducing

them into the wild. But the BFFs suffer from two disadvantages: low genetic diversity and complete susceptibility to Sylvatic plague. We are studying two approaches to address these problems.

First, we are preparing, in conjunction with partners, to develop a permanent “vaccine” to Sylvatic plague. In essence, we are looking to convert an effective vaccine for plague in ferrets into a permanent inheritable trait. If successful, the genetically vaccinated BFFs would be born with resistance to plague, which today can only be accomplished by capturing the animals and treating them with a traditional vaccine. Although this current approach protects the BFFs from plague, it keeps them reliant on the continual efforts of humans for survival in the wild.

We have multiple projects to develop the necessary technology for inheritable vaccines for BFFs. First, we are developing methods for introducing new genes into the BFF genome using advanced reproductive technologies, like cloning. In parallel, we are using lab mice to test the hypothesis that a gene for an antibody that attacks Sylvatic plague can lead to heritable immunity over many generations.

Second, we are looking to increase the genetic diversity of BFFs. Revive & Restore partnered with San Diego Zoo Global to study the genomes of four unique BFF specimens with the goal of understanding the extent of the genetic diversity problem and whether existing

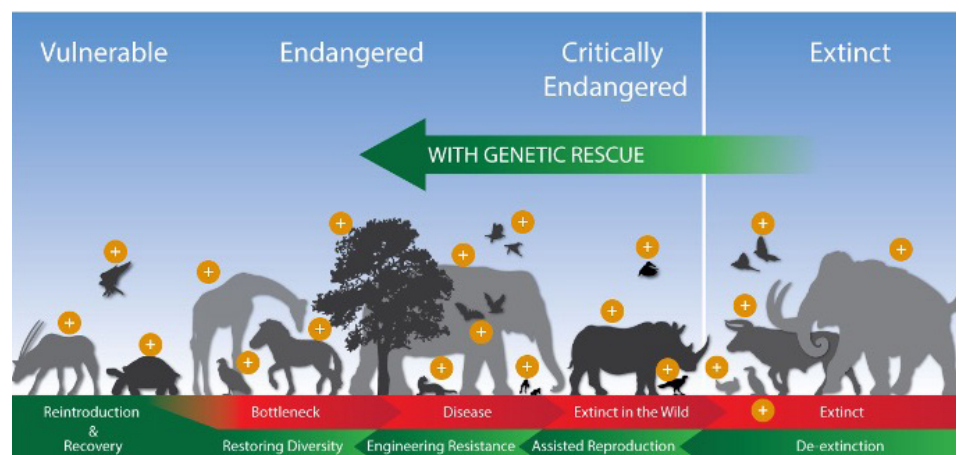
genetic resources could restore diversity into the BFF population. Those genomes were from a living ferret representative of the current population and two cryopreserved cell lines of ferrets originally captured from the wild in the 1980s that were not part of the captive breeding population.

The study found that historic genetic diversity could increase diversity in the living population if historic samples were bred back into the population. Cloning could be used to reproduce the historic ferrets and introduce new founding genetics into the population—a first for an endangered species.

Please go [here](#) for a list of our current projects.

What is the mission of Revive & Restore?

We’re the leading wildlife conservation organization bringing biotechnologies to conservation. Genetics and genomics can help us build a “Genetic Rescue Toolkit” that helps enhance genetic diversity, build disease resistance, facilitate adaptation to climate change, and more. Yet for most conservationists, these tools are still not readily available. Below is a graphic that captures our mission:



(Graphic courtesy of Revive & Restore)

What are the organizational components of Revive & Restore?

One important component is our [Catalyst Science Fund](#). We created this fund to lower the barriers of entry and to increase the use of biotechnology by conservationists through the development of the Genetic Rescue Toolkit. In the space of about two years, we have raised \$6M, which we are using to fund projects aimed at demonstrating the application of biotechnologies to problems that have traditionally been the hardest for conservation to solve. For example, Revive & Restore has reserved \$1.2M in funding for a new program we just launched called [Wild Genomes](#), which will award research grants over the next two years to scientists addressing a clear conservation need. This program will accelerate the genomic sequencing and biobanking of threatened species and put the fundamental tools of genetic rescue directly into the hands of those who manage wildlife.

Why is this important?

We are in a present-day extinction crisis. We know that we have changed the environment significantly over the last 200 years—and the question

is: what do we want to do in the next 200 years? Without addressing biodiversity issues, we will see increasing pathogens (e.g., Ebola, COVID-19) and more challenges to human health. Put differently, humans are part of nature, and humans cannot escape the effects of the degradation of the natural environment. The below graphic shows where we were, where we are, and where we want to move towards: a more bioabundant future.

Let's talk more about bleeding horseshoe crabs. Why do you think the USP changed course?

The motives behind the USP's change in course remain unclear—and as we say in the horseshoe crab world, it smells fishy. What incentive could the USP have to further delay the widespread use of rFC? Who is exerting pressure on the USP? There are several companies that have a vested interest in the bleeding of the horseshoe crabs.

At the same time that the USP changed its course, [it also announced](#) that in light of the global pandemic, COVID-19 vaccine manufacturers can utilize rFC for endotoxin testing and that the USP would provide assistance to do so as part of their [Trust Accelerated](#) program.

The USP's announcement on May 29 appears contradictory: While the USP tells manufacturers that they must provide real-world evidence of rFC equivalence, the USP is also aiding its use for COVID-19 vaccine development.

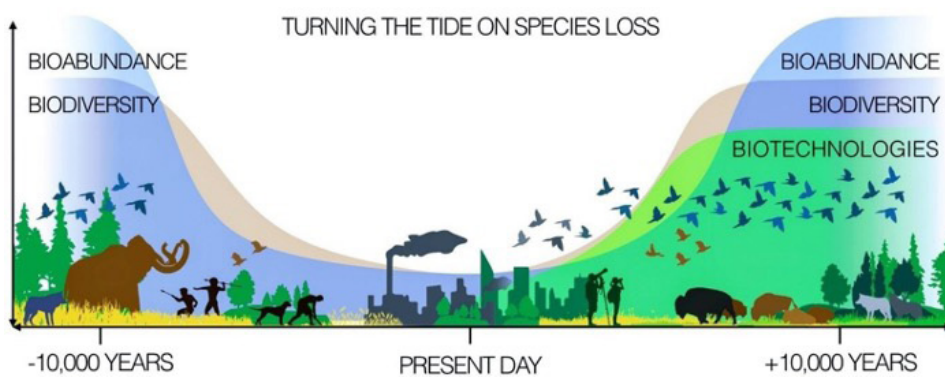
This announcement seems purpose-built to absolve the USP from any liability. As companies ramp up to produce at least 14 billion coronavirus vaccines, there will undoubtedly be an increasing demand for endotoxin testing. By encouraging vaccine manufacturers to use rFC, the USP cannot be blamed if the supply chain of horseshoe crab blood becomes untenable. But, by continuing to place the burden of proof on pharmaceutical companies, the USP punts regulation to the FDA approval process while seemingly keeping the USP in good standing with the horseshoe crab bleeders.

But a few pharmaceutical companies, like Eli Lilly, are already using rFC. Plus, the European Pharmacopeia this July will be publishing the guidance that was expected from the USP.

What does R&R want from the USP?

We want the USP to do what they said they were going to do: 1) honor the existing science and data; and 2) do what pharmaceutical companies are urging them to do. We want the USP to reverse their decision on moving ahead with a separate chapter and demanding further efficacy studies. rFC does not need to be in its own stand-alone chapter in the pharmacopeia. Why? Several reasons, including:

- We know there have been over 200 pharmaceutical products studied using rFC, providing significant data with vaccines, raw materials, and large- and small-molecule drug products. Our own [2018 review](#)



(Graphic courtesy of Revive & Restore)

Continued on page 14...

An Interview with Ryan Phelan . . . *(Continued from page 13)*

article published in *PLOS Biology* of 10 rFC efficacy studies demonstrated that commercially available rFC tests detect endotoxins with results equivalent to or better than LAL, regardless of which company manufactured it. The breadth of these studies also showed strong efficacy across a range of uses and demonstrated high sensitivity, strong reliability, and other positive considerations in the clinical use of rFC.

- We see no evidence-based reason not to declare rFC equivalent to LAL. rFC is made from the horseshoe crab gene that codes for the active component in LAL. But, because LAL includes other factors, it offers less consistent results! Indeed, because LAL suffers from beta-glucan interference, rFC could be deemed superior.
- Removing all unnecessary barriers that prevent the broader use of rFC would give pharmaceutical companies another valuable tool at their disposal to quickly bring forward safe and effective vaccines and therapeutics.
- Both the European Pharmacopoeia and the Chinese Pharmacopoeia have recently recognized rFC. The U.S. is sorely lagging behind, and more importantly, delaying and jeopardizing global harmonization across the pharmacopoeias.
- Given such equivalency, the USP should also consider the larger context of animal welfare and environmental conservation.
- Hundreds of thousands of crabs are subjected to capture, time out

of water in harsh conditions, and bleeding, and then returned to a location very different from where they were originally caught.

- The horseshoe crab plays a key role in the ecosystem. Thousands of migratory birds critically depend on the spawning of the horseshoe crabs as they refuel on their eggs during the spring migration.
- The potential for a crash in horseshoe crab numbers, as happened 30 years ago, could imperil endotoxin testing and hence the supply chain for critical vaccines and therapeutics.
- Because LAL is an essential component of vaccine production, by destroying the only source of this natural product, these companies are potentially creating a downstream national security issue.

What does R&R want from pharmaceutical companies?

We would like to see more pharmaceutical companies adopt rFC. Just testing the water used in manufacturing with rFC pharma could reduce its reliance on LAL by 90 percent. Doing so is the right thing for the environment and for public health, and would reduce supply chain risk for a component that is essential for vaccine manufacture because current processes rely on non-sustainable harvesting of a wild animal. We also would ask pharmaceutical companies to write the USP and demand that the USP remove all barriers to adoption of rFC.

How can people get involved with R&R?

There are many ways to help. Perhaps the most direct way to make a difference is to contribute to our Catalyst Science Fund. Every contribution helps fund the science needed to secure a more biodiverse future. We are building a new community of biotechnologists focused on creating solutions, not just measuring the decline of the natural world. It's an exciting and optimistic way to get involved in conservation, and there is such a wide range of species that can be helped by this approach. Corporate contributions helped jumpstart the fund (Promega Corporation donated the first \$3M). We've been able to match that contribution so far, and now intend to grow the fund to \$10M.

Is there anything else you would like readers to know?

In light of COVID-19, we all realize how human health and the environment are intimately intertwined, and the importance of using cutting-edge science to solve urgent problems. R&R is one small part of this and relies on the involvement of people from all walks of life. Our effort to grow the Catalyst Science Fund is instrumental to that success. It is often difficult for researchers to find funding to utilize the tools of biotechnology, like genomic sequencing, in their conservation work because it is so experimental. Catalyst Science Fund grants enable these researchers to generate the first proofs of concept for these new approaches, which can lead to increased interest by the larger funding community.

How can readers get in touch with you?

I can be reached by email at ryan@reviverestore.org.

Life Sciences Innovation Culture and Deconstruction

By Paul P. Campbell, W. L. Gore & Associates

Ernst & Young's 2020 *M&A Firepower* report reveals that life sciences mergers and acquisitions (M&A) activity, led by big pharma, hit a new high of \$357 billion in 2019, surpassing the 2014 record of \$335 billion. While it's unlikely that 2020 M&A activity will reach 2019 levels due to the challenging economic environment of the COVID-19 pandemic, life sciences companies are sitting on more than \$1 trillion in capital.¹

The opportunities afforded by science and technology innovation are not lost on entrepreneurs and the investment community—and they present attractive propositions for incumbent corporate entities seeking to reinvigorate their organizations. Facing rapid technological change and market volatility, large institutions can struggle with innovation while lean start-ups battle limited resources. This naturally encourages incumbent-start-up pairing to leverage strengths and mitigate weaknesses.

According to the PitchBook-National Venture Capital Association (NVCA) 1Q 2019 *Venture Monitor*, nearly a quarter (23 percent) of life sciences and healthcare start-ups that raised at least \$4 million over 2017 and 2018 had been involved with an accelerator or incubator.² The Q4 2019 *Venture Monitor* notes that entrepreneurs in developing markets increasingly start businesses at home after having completed their higher studies and work stints in the U.S. and Europe, where they gain access to mentorship and information through

global accelerators and thriving start-up communities.³

Incubator, accelerator, M&A, and start-up partnership programs each have their own nuances, but they all share the ultimate purpose of generating business value through innovation. But too often, this pursuit fails to generate the intended outcome. Specifically, while pursuing disruptive new lines of business, large organizations tend to fumble with culture.

Innovation Culture

Business innovation typically evolves through three phases: ideate, incubate, and scaleup.⁴ Within organizations, ventures move through these phases within a framework, which can be thought of as an innovation pyramid. There will be strategic direction at the bottom and target layers of commercialization at the top—structural elements that are difficult to change. In between, there's an area open for play. This middle area consists of “culture.”

Culture, often misidentified as an organization's esprit de corps, is actually a collection of principles and practices that an organization employs to accomplish work. Lean Six Sigma, design thinking, business model experimentation, collaborative iteration, continuous delivery, and so forth are all elements of innovative culture.

Principles and Practices

Life sciences organizations tend to focus too little on the breadth of these tools and practices, and their

interplay in moving innovation from strategic direction to core line of business. Innovative technologies get stuck inside core R&D labs and never get commercialized, lean practices are introduced to diagnose company problems but engaged only in priority areas, or companies pursue a cycle of growth best described as “acquire and purge, acquire and purge, repeat.”

Culture harbors an innovation opportunity distinct from the value proposition of whatever new technology or product is being pursued, integrated, or developed. Successful incumbent-start-up collaboration can hinge on scrutinizing that opportunity.

Principles and practices are both essential elements in culture, but they are not the same thing. A company's principles (mission and core values) should run deep and remain intact, regardless of collaborative endeavor or acquisition.

But the *practices* that determine how work gets done in the company should be fair game for changes that will effectuate innovation.

Deconstruction

In the traditional innovation phase progression, an added step of “deconstruction” should take place between ideation and incubation. Deconstruction is a culture-focused process of analyzing and changing internal practices to match the new opportunity being pursued.

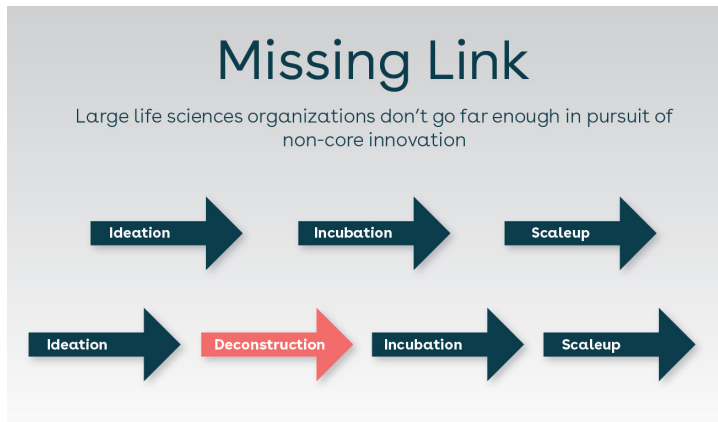
¹ See https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/life-sciences/life-sciences-pdfs/ey-firepower-report-2020-how-will-deals-done-now-deliver-what-the-health-ecosystem-needs-next-v2.pdf.

² See https://files.pitchbook.com/website/files/pdf/1Q_2019_PitchBook_NVCA_Venture_Monitor.pdf.

³ See https://files.pitchbook.com/website/files/pdf/Q4_2019_PitchBook_NVCA_Venture_Monitor.pdf.

⁴ See http://www.impacthub.net/wp-content/uploads/2017/01/Incubation_Acceleration_Scaling.pdf.

Life Sciences Innovation Culture and Deconstruction *(Continued from page 15)*



This does not mean tearing down and restructuring the company or destroying the core business. Instead, it's a critical evaluation of assets assessed against the new opportunity. Essentially, what's great for meeting the needs of existing markets and existing customers may not be appropriate for the new market being explored or the desired new customers—and that must be addressed.

Deconstruction in Action

In my work with W. L. Gore & Associates, we collaborated recently with start-ups Checkerspot, Graftworx, and Moray Medical, among others. These collaborations were made between a small, dedicated business team that was managed independently from core business units. This separation was necessary so that Gore could participate more successfully in the start-up ecosystem.

Deconstruction enabled investment and collaboration decisions to be made via new processes that hadn't existed within the company previously. Because no formal Gore corporate venture capital (CVC) program existed, we forged partnership-tailored processes for establishing investment mechanisms, selecting and approving investments,

establishing ground rules for collaborations, and aligning investment activities to enterprise strategy—all with an eye toward finding disruptive technologies and business models outside our core businesses. This deconstruction/

reconstruction cycle has made us more agile and promoted successful endeavors with our start-up partners, resulting in early-stage start-ups either concluding or initiating follow-on investment rounds.

Years ago, when I worked at Hewlett-Packard, I initiated another deconstruction approach. We had attempted to start a new business, but it went nowhere—we just couldn't move fast enough. Our unit decided to seek external collaborations, which led to an acquisition that spurred aggressive pursuit of the new opportunity. The deconstruction step involved carving out a vertical business team that cut across the company's many product-centric businesses to ensure understanding of (and focus on) the new target segment. We altered the way we marketed and sold products, we set up a new supply chain approach, and we changed how we developed new products entirely. Once the acquired start-up joined the team, we gained the speed and effectiveness we'd been lacking and soon launched a series of products that achieved significant market success and continue to this day.

As Gary Pisano wrote in his excellent commentary on innovation in *Harvard Business Review*, "because innovative cultures are systems

of interdependent behaviors, they cannot be implemented in a piecemeal fashion."⁵ A comprehensive examination of the whole spectrum of practices and policies impacting a minimum level of capabilities is needed to establish programs that will progress to deployment. This should cover venturing, contracts and agreements, intellectual property terms, and adaptive business models—and it will cut across the organizational culture.

Deconstruction examines existing practices concerning HR, legal procurement, supply chain, brand identity, product development, go-to-market, and finance. There is no area off-limits.

Undertaken from the vantage of the disruptor, this process will identify barriers and produce changes to fundamental processes and support functions that will get in the way of new business. Deconstruction can prevent the superimposition of incumbent company practices and performance metrics where they don't belong, recalibrate culture for productivity, and clear the path for innovation initiatives and partnerships with start-ups to proceed unhindered.

Paul P. Campbell is enterprise innovation leader in digital health for W. L. Gore & Associates, the global materials science company. In 2017, Gore established an 11,000-square-foot innovation center in Santa Clara, Calif., that leverages the company's 60 years of engineering expertise to help start-ups pursue new concepts and ideas, build prototypes, and test material sets. Start-ups may apply for the Silicon Valley residency program at <https://www.gore.com/innovation-center>.

⁵ See <https://hbr.org/2019/01/the-hard-truth-about-innovative-cultures>.

Select Life Sciences Client Highlights

Soleno Therapeutics Announces Closing of \$57.5 Million Public Offering of Common Stock

On June 26, Soleno Therapeutics, Inc., a clinical-stage biopharmaceutical company developing novel therapeutics for the treatment of rare diseases, announced the closing of its previously announced underwritten public offering of 34,848,484 shares of its common stock, including 4,545,454 shares sold upon full exercise of the underwriters' option to purchase additional shares, at a public offering price of \$1.65 per share. The net proceeds of the offering were approximately \$53.7 million, after deducting the underwriting discount and other offering expenses. Wilson Sonsini represented Soleno Therapeutics in the transaction. For further information, see <http://investors.soleno.life/news-releases/news-release-details/soleno-therapeutics-announces-closing-575-million-public>.

Orca Bio Announces \$192 Million Series D Financing

On June 17, Orca Bio, a clinical-stage biotechnology company developing high-precision allogeneic cell therapies, announced a Series D financing round worth \$192 million, bringing its total capital raised since its 2016 launch to nearly \$300 million. The round was co-led by Lightspeed Venture Partners and an undisclosed investor. Other new and existing investors included 8VC, DCVC Bio, ND Capital, Mubadala Investment Company, Kaiser Foundation Hospitals, Kaiser Permanente Group Trust, and IMRF. The funds will be used to continue advancing Orca Bio's cell therapy pipeline and novel manufacturing platform. Wilson Sonsini represented Orca Bio in patent matters related to the transaction. To learn more, visit <https://orcabio.com/news/2020-06-17/>.

Avidity Biosciences Announces Closing of IPO

On June 16, Avidity Biosciences, Inc., a

biopharmaceutical company pioneering a new class of oligonucleotide-based therapies called Antibody Oligonucleotide Conjugates (AOCs™), announced the closing of its initial public offering of 16,560,000 shares of common stock, which includes the exercise in full by the underwriters of their option to purchase 2,160,000 additional shares, at a public offering price of \$18 per share. The aggregate gross proceeds from the offering, before deducting underwriting discounts and commissions and other offering expenses payable by Avidity, were approximately \$298.1 million. Wilson Sonsini advised Avidity on patent matters related to the transaction. Additional details are available at <https://aviditybiosciences.investorroom.com/2020-06-16-Avidity-Biosciences-Announces-Closing-of-Initial-Public-Offering-and-Full-Exercise-of-Underwriters-Option-to-Purchase-Additional-Shares>.

Foundation Medicine Completes Acquisition of Lexent Bio

On June 12, Foundation Medicine (member of the Roche Group), a Massachusetts-based molecular information company providing genomic profiling services that help personalize cancer care, announced that it has completed the acquisition of Lexent Bio, Inc., a California-based precision oncology company building novel liquid biopsy technology to advance cancer care. The total potential consideration was undisclosed, but included an upfront payment as well as contingent milestone payments. Wilson Sonsini advised Lexent Bio in the transaction and has advised the company since its formation. For more information, visit <https://www.foundationmedicine.com/press-releases/a5c44c8c-b102-4287-98da-9ff38222fb13>.

Nautilus Biotechnology Raises \$76 Million in Series B Funding

On May 21, Nautilus Biotechnology, a company pioneering a high-throughput,

low-cost platform for analyzing and quantifying the human proteome, announced it has raised \$76 million in an oversubscribed Series B offering that closed on May 18, placing the company's total funding in excess of \$100 million. The round was led by Vulcan Capital and included new investors Perceptive Advisors, Bezos Expeditions, and Defy Partners. Previous investors AME Cloud Ventures, Andreessen Horowitz, Bolt, and Madrona Venture Group also participated in the round. Wilson Sonsini represented Nautilus in the transaction. Further details are available at <https://www.nautilus.bio/news/nautilus-biotechnology-raises-76-million-in-series-b-funding-to-be-the-first-to-quantify-the-human-proteome/>.

Dascena Announces Closing of \$50 Million Series B Financing

On April 30, Dascena, Inc., a machine learning diagnostic algorithm company targeting early disease intervention to improve patient care outcomes, announced that it has closed a \$50 million Series B financing led by Frazier Healthcare Partners with participation from Longitude Capital, existing investor Euclidean Capital, and an undisclosed investor. Wilson Sonsini represented Dascena in the transaction. For more information, visit <https://www.dascena.com/news/dascena-announces-closing-of-50-million-series-b-financing-to-support-advancement-of-diagnostic-algorithm-development-engine-to-inform-patient-care-and-improve-outcomes>.

ORIC Pharmaceuticals Announces Closing of IPO

On April 28, ORIC Pharmaceuticals, a clinical-stage oncology company focused on developing treatments that address mechanisms of therapeutic resistance, announced the closing of its initial public offering of 8,625,000 shares of its common stock, which includes the exercise in full of the underwriters'

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Select Life Sciences Client Highlights *(Continued from page 17)*

option to purchase 1,125,000 additional shares of its common stock, at a price to the public of \$16.00 per share. The shares began trading on the Nasdaq Global Select Market on April 24 under the symbol "ORIC." Wilson Sonsini advised ORIC Pharmaceuticals in the offering. Further details are available at <https://investors.oricpharma.com/news-releases/news-release-details/oric-pharmaceuticals-announces-closing-initial-public-offering>.

Nitrome Biosciences Raises \$38 Million Series A Financing

On April 21, Nitrome Biosciences, a privately held biopharmaceutical company developing a platform around a newly identified class of enzymes to target Parkinson's disease and other age-related disorders, announced that it has closed a Series A financing of \$38 million co-led by Sofinnova Partners and AbbVie Ventures, AbbVie's corporate strategic venture capital arm, with further participation from the Dementia Discovery Fund, Mission Bay Capital, and Alexandria Venture Investments. Wilson Sonsini represented Nitrome in the transaction. Visit <https://www.businesswire.com/news/home/20200421005787/en/> for additional information.

Crinetics Pharmaceuticals Announces Closing of \$115 Million Public Offering

On April 17, Crinetics Pharmaceuticals, a clinical-stage pharmaceutical company focused on the discovery, development, and commercialization of novel therapeutics for rare endocrine diseases and endocrine-related tumors, announced that it has closed its previously announced underwritten public offering of 8,222,500 shares of its common stock, including 1,072,500 shares sold pursuant to the underwriters' full exercise of their option to purchase additional shares, at a price to the public of \$14 per share. Wilson Sonsini represented Crinetics Pharmaceuticals in

patent matters related to the transaction. Learn more at <http://ir.crinetics.com/news-releases/news-release-details/crinetics-pharmaceuticals-announces-closing-public-offering>.

Kindred Biosciences Completes \$43 Million Sale of Mirataz® to Dechra Pharmaceuticals

On April 15, Kindred Biosciences, a biopharmaceutical company focused on saving and improving the lives of pets, announced that it has completed the sale of Mirataz® (mirtazapine transdermal ointment), a topical medication for use in cats, to Dechra Pharmaceuticals for an upfront payment of \$43 million and royalties on worldwide sales. Wilson Sonsini represented Kindred Biosciences in the transaction. Additional information is available at <https://ir.kindredbio.com/news-releases/news-release-details/kindred-biosciences-announces-completion-mirataz-mirtazapine>.

Curzion Pharmaceuticals Acquired by Horizon Therapeutics for \$45 Million

On April 2, Horizon Therapeutics announced that it has acquired Curizon Pharmaceuticals, a privately owned biopharma company, and its development-stage oral selective lysophosphatidic acid 1 receptor (LPA1) antagonist, CZN001 (renamed HZN-825). Under the terms of the agreement, Horizon acquired Curzion for a \$45 million upfront cash payment with additional payments contingent on the achievement of development and regulatory milestones. Wilson Sonsini represented Curizon in company patent matters and IP matters related to the acquisition. Visit <https://ir.horizontherapeutics.com/news-releases/news-release-details/horizon-therapeutics-plc-acquires-curzion-pharmaceuticals-inc> for more information.

Savara Enters License and Collaboration Agreement with Grifols for Apulmiq

Also on April 2, Savara Inc., an orphan lung disease company, announced that it has entered into an exclusive license and collaboration agreement with Grifols for Apulmiq (inhaled liposomal ciprofloxacin) after Grifols had acquired the assets in a bankruptcy process. Apulmiq is a late-stage investigational inhaled antibiotic in Phase 3 development for the treatment of non-cystic fibrosis bronchiectasis. Wilson Sonsini represented Savara in the transaction. For further details, visit <https://savarapharma.com/investors/press-releases/release/?id=12781>.

iTeos Therapeutics Closes \$125 Million Series B2 Financing

On April 1, iTeos Therapeutics, a privately held clinical-stage biotech company developing innovative cancer immunotherapies, announced the closing of an oversubscribed Series B2 financing, which raised a total of \$125 million. The financing round was co-led by RA Capital Management and Boxer Capital, and included new investors Janus Henderson Investors, RTW Investments, and Invus, along with existing investors MPM Capital, HBM Partners, 6 Dimensions Capital, Curative Ventures, Fund+, VIVES Louvain Technology Fund, SRIW, and SFPI. Wilson Sonsini advised investors on IP matters in the transaction. Please see <https://www.iteostherapeutics.com/news/iteos-therapeutics-closes-125-million-series-b2-financing> for more information.

SanBio Announces Development and Commercialization Alliance with Ocumension

On March 31, Tokyo-based SanBio Co., which is focused on regenerative cell medicines for neurological disorders, announced that it has entered into a development and commercialization

alliance with Ocumension (Hong Kong) Limited. The collaboration will accelerate the research, development, and commercialization of innovative stem cell therapies for ophthalmic diseases. Wilson Sonsini advised SanBio in the agreement. Further details are available at <https://www.businesswire.com/news/home/20200331005923/en/Notice-Business-Alliance-Sanbio-Ocumension-Research-Development>.

ReCode Therapeutics Announces Completion of Merger with TranscripTx, Inc. and Closing of Oversubscribed \$80 Million Series A Fundraising

On March 26, ReCode Therapeutics, Inc. announced the completion of an all-stock merger with TranscripTx, Inc. and, immediately thereafter, the closing of an oversubscribed \$80 million Series A financing round. OrbiMed Advisors LLC and Colt Ventures co-led the round, with participation from MPM Capital, Vida Ventures LLC, Hunt Technology Ventures, L.P., and Osage University Partners. ReCode will use the proceeds to continue the preclinical development of its lead programs in primary ciliary dyskinesia and cystic fibrosis. Wilson Sonsini represented TranscripTx in the merger and represents the post-transaction ReCode. Please see <https://recodetx.com/wp-content/uploads/ReCode-Therapeutics-Series-A-Financing-Announcement-032620-FINAL.pdf> for more information.

CG Oncology Announces License, Development, and Commercialization Agreement with Kissei Pharmaceutical

Also on March 26, CG Oncology announced an exclusive license, development, and commercialization agreement with Kissei Pharmaceutical Co., Ltd. for its oncolytic immunotherapy drug CG0070 for Japan, South Korea, Taiwan, and other Asian countries with

the exception of China. Under the terms of the agreement, CG Oncology receives a licensing fee of \$10 million in cash, with the potential for an additional \$100 million in development and commercial milestone payments, and will receive certain royalties on sales of CG0070 in the territories licensed by Kissei. CG Oncology also receives a \$30 million equity investment from Kissei. Wilson Sonsini Goodrich & Rosati represented CG Oncology in the transaction. Visit <https://www.cgoncology.com/news/press-releases/032620/> for additional details.

Forge Therapeutics Enters Collaboration with Roche to Develop Novel Antibiotic to Treat Lung Infections

On March 25, Forge Therapeutics announced that it has entered into a research collaboration and option agreement with Hoffmann-La Roche (Roche) to license FG-LpxC LUNG, a novel antibiotic for the treatment of serious lung infections. The FG-LpxC LUNG program is being developed to treat hospital-based infections. Under the agreement, Roche has an exclusive option to license the program from Forge, which is eligible to receive up to \$190.5 million in total payments, including potential sales-based payments and royalties upon commercialization of the program. Wilson Sonsini represented Forge in the transaction. Further information is available at <https://forgetherapeutics.com/forge-enters-into-collaboration-with-roche-to-develop-novel-sntibiotic-to-treat-lung-infections/>.

Elevar Therapeutics Acquires Global Rights to Apealea® from Oasmia Pharmaceutical

Also on March 25, Elevar Therapeutics, a biopharmaceutical company focused on promising therapies for unmet medical needs in cancer, announced an

agreement with Sweden-based Oasmia Pharmaceutical AP, a company engaged in the field of human and veterinary oncology, to obtain global rights for Apealea®, except in the Nordics, Russia, and certain countries in Eastern Europe. Apealea®, a non-cremophor formulation of the well-known chemotherapeutic agent paclitaxel, has been approved by the European regulatory authorities for use in combination with carboplatin for the treatment of adult patients with certain cancers. Wilson Sonsini advised Elevar Therapeutics in the agreement. Visit <https://elevartherapeutics.com/2020/03/25/elevar-therapeutics-acquires-global-rights-to-european-approved-apealea-from-oasmia-pharmaceutical/> for additional details.

Design Therapeutics Launches with \$45 Million to Develop a New Class of Disease-Modifying Therapies for Serious Degenerative Disorder

On March 20, Design Therapeutics announced it is launching to create and develop a new class of therapies for patients with serious degenerative disorders caused by nucleotide repeat expansions. The company has closed a \$45 million Series A financing led by SR One, with participation from Cormorant Asset Management, Quan Capital, and WestRiver Group. Wilson Sonsini supported Design Therapeutics in the transaction and is representing the company in IP matters. Please see <https://www.businesswire.com/news/home/20200320005061/en/Design-Therapeutics-Launches-45-Million-Develop-New> for more information.

Circle Pharma Raises \$45 Million in Series B Financing

On March 17, Circle Pharma, Inc., a macrocycle drug discovery and development company focused on intractable cancer targets, announced that it has raised \$45 million in a Series B financing. The financing was led by

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The Column Group, with participation by Nextech Invest. All investors from the prior round—ShangPharma, LifeForce Capital, and the Berkeley Catalyst Fund—joined the financing. Proceeds will be used to advance Circle’s work to develop inhibitors of Cyclin A and Cyclin E, and to expand the company’s pipeline. Wilson Sonsini represented Circle Pharma in the transaction. Visit <https://www.businesswire.com/news/home/20200317005159/en/> for additional details.

illumina Announces Global Strategic Collaboration with IDbyDNA

On March 17, Illumina, Inc. announced a global strategic collaboration with IDbyDNA Inc., a metagenomics technology company setting a standard for detection, identification, and interpretation of microorganisms and their role in human health, to bring comprehensive next-generation sequencing (NGS)-based workflows to the global microbiology market. Wilson Sonsini represented IDbyDNA in the

transaction. Please see <https://www.illumina.com/company/news-center/feature-articles/illumina-and-idbydna-partner-to-deliver-ngs-infectious-disease-s.html> for more information.

Nurix Therapeutics Closes \$120 Million Financing

On March 12, Nurix Therapeutics, Inc., a company developing targeted protein modulation drugs, announced it has closed an oversubscribed \$120 million financing. The round was led by Foresite Capital with participation from Bain Capital Life Sciences, Boxer Capital (Tavistock Group), EcoR1 Capital, Redmile Group, Wellington Management Company, and an undisclosed investor, as well as Nurix’s founding investors The Column Group and Third Rock Ventures. Wilson Sonsini represented lead investor Foresite Capital in the transaction. Please refer to <https://www.nurixtx.com/nurix-therapeutics-closes-120-million-financing-to-advance-targeted-protein-modulation-drug-pipeline/> for further information.

Keros Therapeutics Announces Close of \$56 Million Series C Financing

On March 4, Keros Therapeutics, Inc., a biotechnology company focused on the discovery, development, and commercialization of novel treatments for patients suffering from hematologic and musculoskeletal disorders with high unmet medical need, announced the close of its \$56 million Series C financing, bringing its total venture funding to \$78.5 million to date. The financing was led by new investors Foresite Capital, OrbiMed, Cowen Healthcare Investments, and Venrock. Certain of Keros’ existing investors also participated, including Pontifax, Arkin Bio Ventures, Partners Innovation Fund, Global Health Sciences Fund, and Medison Pharma. Wilson Sonsini represented Foresite Capital in the transaction. More detail can be found at <https://www.kerostx.com/news/435sehnj5n4nw09okfn2iqc3r5ne8b>.

Casey McGlynn, a leader of the firm’s life sciences practice, has editorial oversight of *The Life Sciences Report* and was assisted by Philip Oettinger, Elton Satusky, Scott Murano, and James Huie. They would like to take this opportunity to thank all of the contributors to the report, which is published on a semi-annual basis.



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