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With most major biopharma companies now active in China, the emphasis has begun to shift from participating to outperforming. Multinationals have three opportunities to maximize their investments.

**EXTERNALIZE R&D ACTIVITIES**
CROs in China are working across almost the full R&D value chain and are building capabilities that are on a par with world-class standards. This has created new opportunities to push the boundaries of R&D externalization.

**CREATE NETWORKS TO ACCESS NEW SOURCES OF INNOVATION**
Locally driven R&D has yet to reach critical mass, but momentum is building. A strong team that knows when and where to invest will provide a competitive advantage. Global biopharmas should focus not simply on acquiring local IP but on enabling its conversion into medicine.

**PURSUE NEW-DRUG DISCOVERY IN CHINA**
Multinationals must ensure that their discovery efforts are framed by clear goals and backed by the necessary resources. They can also take advantage of a fresh start by employing new decision-making and governance models.
Five years ago, only a few global biopharma companies had made significant R&D investments in China. But the growth potential—in terms of both the quantity and quality of investments—was unmistakable. We predicted that most major biopharmas would steer more of their R&D activities to China, mainly to access the domestic market but also to tap greater efficiencies—the standard fare of offshoring opportunities. As public and private investments swelled, multinationals would inevitably set their sights higher. They would focus not simply on sourcing but on partnering, and not only on curbing costs but also on spurring innovation.

In many respects, the development of biopharma R&D in China has exceeded our expectations. Virtually every major biopharma company has made substantial investments, while the country’s R&D ecosystem has continued to become more vibrant, providing new opportunities for multinationals to expand the depth and breadth of their work. Medical journals and newspapers are full of stories about the great things to come, acquisitions and partnerships are regularly announced, investment dollars are flowing, and China is one of the hottest topics in biopharma boardrooms around the world.

But with the new possibilities come new risks. The first wave of foreign R&D investments was focused on a small set of clear-cut opportunities. The second wave, now under way, is characterized by a well-placed eagerness to leverage the benefits of a more advanced R&D sector. In pursuing new avenues of innovation, however, biopharma companies may be propelled more by the momentum of a burgeoning R&D sector—or concerns about losing a step to the competition—than by a well-defined strategy. Multinationals should continue to push the boundaries of R&D in China, but they need to apply at least the same rigor that guides their research projects elsewhere in the world.

Fertile Ground for R&D

By almost any measure, China has become a more attractive destination for biopharma R&D. For starters, its pharmaceutical market, measured in revenues, is on track to become the second largest market in the world by 2015, with revenues of more than $100 billion. Its 20 percent annual growth has been driven largely by expanded access to care. An in-country R&D presence provides a good foothold for foreign companies looking to capitalize on this opportunity.

The surge of consumption could well be matched by a boom in production. The Chinese government featured biotechnology in its Twelfth Five-Year Plan in 2011...
and is implementing policies to spur private-sector investments—for example, by allowing premium pricing for innovative drugs and strengthening intellectual property (IP) rights. Its efforts have contributed to a jump in R&D spending: from 2006 to 2010, China’s biopharma industry nearly tripled its R&D investments, to $3.5 billion. (The growth has been impressive, but this still equates to only about 5 percent of the investments made by the U.S. biopharma industry and is less than half of what some individual biopharma giants spend.) These investments will build on a biotechnology sector that has matured significantly over the past several years.

- The talent pool is growing rapidly. Universities are turning out more graduates in relevant fields, and the rate of Chinese scientists returning home has accelerated over the past several years. Many of these Western-trained or Western-educated scientists are coming home with plans to apply their experience in drug discovery and development.

- China’s contract research organization (CRO) sector has become indispensible to the global biopharma industry, having proven its ability to reduce costs and increase flexibility across the R&D value chain. (See Exhibit 1.) Almost every global biopharma company outsources at least some of its R&D activities to China, taking advantage of the diverse range of CRO vendors, which extends from specialists to end-to-end providers.

- Local innovation—discoveries that could lead to new pharmaceuticals—is on the rise. The most promising sources are the new biotech startups, many formed by returning scientists, but academics and domestic pharmaceutical companies are also making meaningful contributions through basic research discoveries as well as new medicines. (For more on this, see the sidebar “Squaring Off Against a New Kind of Local Competitor.”)

While China’s R&D environment has been flourishing, the global biopharma industry has been grappling with a steady decline in R&D productivity and the long-feared patent cliff. The confluence of these trends has led many global biopharma companies to ramp up their R&D activities in China. Initially, their investments were geared toward facilitating market access, but most have since taken advantage of low-cost sourcing. A typical investment consists of a new facility in Beijing or Shanghai, the promise of hundreds of jobs, and a multiyear commitment of funds on the order of $100 million. (See Exhibit 2.) Over the past five years, seven companies have made such announcements, while an eighth, Novartis, pledged to invest $1.25 billion over five years.

Our outlook for China’s R&D sector is as optimistic as it was five years ago. Over the next five to ten years, China-based CROs will evolve to the point where high-quality one-stop shops will be a reality. In addition, leading academics will rise to the level of global leaders, propelled by a surge of research and publications. (It will likely take a few more years for China’s research sector to become adept at translating discoveries into new drugs.) China’s biotechnology industry will continue to grow—and some local firms will hit home runs. There is no reason to think they will achieve a higher rate of scientific success than their U.S. and European counter-
parts, but they will be better positioned for commercial success in China, and their
drugs could have a speedier journey through the regulatory process.

Making the Most of R&D Investments in China
With most major biopharma companies now active in China, the emphasis has begun to shift from participating to outperforming. Companies are stretching their ambitions in a way that mirrors the evolution of China’s R&D sector, and they are aiming to do more with their investments relative to their competitors.

This shift dovetails with a broader change taking place in China, where labor rates in the manufacturing sector continue to climb. By 2015, average factory-worker
wages in China could reach 17 percent of those in the U.S., up from 3 percent in 2000. (For more on this, see Made in America, Again: Why Manufacturing Will Return to the U.S., BCG report, August 2011.) The ongoing change in the cost equation has profound implications for manufacturers, some of which have already begun to revise their global sourcing strategies. The consequences are less dramatic for the global biopharma industry, but they underscore the dangers of predating a China strategy solely on labor-cost arbitrage. Although China will continue to provide cost advantages to global biopharma companies, these advantages are likely to diminish

SQUARING OFF AGAINST A NEW KIND OF LOCAL COMPETITOR

Among the many unique and challenging features of China’s biopharma market is its range of dynamic competitors. From an R&D perspective, local biopharma companies—despite being dwarfed by their Western counterparts—can still be a competitive force in the marketplace. Jiangsu Hengrui Medicine Company, China’s leading domestic producer of oncology medicines, exemplifies this potential as well as any local competitor.

With a strong revenue stream from generic oncology medicines and aspirations to become an innovative pharmaceutical company, Hengrui has allocated a significant portion of its R&D investments to so-called follow-on projects. To initiate them, Hengrui looks for novel compounds that are just beginning their global clinical trials. It then develops same-class compounds—often referred to as “me-too” or “me-better” compounds—and carries the discovery work through to candidate selection. If the original compound achieves proof of concept, Hengrui proceeds with clinical trials of its own versions, confident in the outcome. Throughout the process—and especially during the trials—Hengrui emphasizes efficiency and streamlined decision making. This approach could allow the company to narrow the gap between the launch of a novel compound and the release of its own follow-on product to about one to two years.

Compounds that fall into the me-too category may not have sufficient commercial value to be marketed in the U.S. or Europe, given their lack of clinical differentiation. But Hengrui is focused squarely on China, where originality and being first to market are relatively less important than accessibility (including pricing).

Strategies like Hengrui’s have two major implications for the Chinese biopharma market. First, they will change the marketability of new medicines in China, as lower-price competition will arise very quickly, even for first-in-class drugs. Second, by allowing local companies to become more familiar with the process of developing drugs, they will eventually lead to a more competitive industry. The former is clearly a threat to multinationals, while the latter is a mixed blessing. Multinationals will face stiffer competition, but they will also find new options for partnering with or acquiring local companies.
over time, particularly given the rising costs of recruiting and retaining experienced talent.

Global biopharma companies have three opportunities to maximize their R&D investments in China. They can externalize more of their R&D activities, create networks to access new sources of innovation, or pursue new-drug discovery in China. The first two are must-haves—pathways that every company must follow to capitalize on an increasingly capable R&D sector. The third opportunity carries more significant rewards—and risks.

**Externalize R&D activities.** When global biopharma companies began outsourcing activities to China, they did so mainly for cost savings, in part because they had low expectations regarding the ability of Chinese scientists to design and conduct complex experiments. The focus was squarely on transactional, execution-oriented tasks, such as chemical synthesis. While these areas are still the core strengths of CROs, today these organizations are working across almost the full R&D value chain, and some are building capabilities on a par with world-class standards. The sector has developed to a point where multinationals should no longer ask, “What services are available?” but rather, “What do we want to externalize?”

Relationships are also evolving, with multinationals and CROs shifting toward strategic partnerships based on long-term incentives and complex activities. Some multinationals have outsourced entire portions of the R&D value chain. Several
have taken the long view and are not just leveraging local capabilities but also accelerating their development. For example, Johnson & Johnson has formed a partnership with WuXi AppTec for nonclinical safety testing, with WuXi providing toxicology and other services to Johnson & Johnson, and J&J providing training (reimbursed by WuXi) in good laboratory practice (GLP) systems and capabilities.

To take advantage of China’s maturing CRO sector, multinationals should continually reevaluate the balance between internal and external activities, based on an up-to-date view of the range and quality of services available. Outsourcing more activities can offer greater efficiencies and flexibility while ensuring that internal resources are focused on the most critical, highest-value activities.

**Create networks to access new sources of innovation.** Locally driven R&D has yet to reach critical mass, but the raw materials are there. Picking out the treasures and knowing when and where to invest will be important. Global biopharma companies will need to keep tabs on what’s going on in academia and in the labs. Investing in startup biotechnology companies is one way to stay plugged in, but there are other options for building local networks. Global biopharmas could also invest in or partner with Chinese pharmaceutical companies to accelerate local innovation, but they will need to construct such deals carefully to ensure that they share in the rewards.

Most multinationals have already developed such networks. GlaxoSmithKline has a ten-year collaboration program with Shanghai Institute of Materia Medica, which is part of the Chinese Academy of Sciences, to pursue combinational chemistry. Novo Nordisk provides funding to the Chinese Academy of Sciences to support promising young talent through the Great Wall professorship. In July 2010, Sanofi-Aventis licensed a technology patent from Shanghai Institutes for Biological Sciences relating to discoveries that may lead to an antiangiogenesis cancer drug.

To get the most out of their partnerships, global biopharmas should focus not simply on acquiring local IP but on enabling its conversion into medicine. They can do this by bridging two gaps in the innovation process. The first is in translational research. While Chinese laboratories have made great strides in producing groundbreaking research, they have limited experience in translating these discoveries into new medicines. The absence of a biotech tradition creates an opportunity for global biopharmas to make upstream investments designed to convert discoveries into drugs (though such investments are admittedly risky and could take years to pay off). The second gap stems from the shortage of local scientists with the skills and experience needed to design sophisticated trials. By providing clinical development expertise, multinationals can help advance promising efforts that might otherwise suffer delays owing to inefficient execution.

**Pursue new-drug discovery in China.** This opportunity is emblematic of the second wave of foreign investment. Global companies are looking to China not simply as a platform to support their existing portfolio but rather as a well of ideas for innovative drugs. Currently, only a small number of multinationals are conducting new-drug discovery in China, and the bias is toward “local” diseases with a higher prevalence in Asia. For example, Pfizer is consolidating its anti-infectives R&D ac-
tivities from the U.S. and the U.K. into a new Shanghai-based unit; AstraZeneca is focusing its local R&D efforts on gastric and liver cancer in the region; GlaxoSmithKline is focusing on neurodegenerative diseases; and Eli Lilly is establishing a facility to drive diabetes research, with a focus on molecular differences that are specific to the disease in Asia. But with the industry looking for ways to reinvigorate the product pipeline, together with the increasing sophistication of China’s biotechnology sector, it seems inevitable that more companies will follow.

There is a risk, however, that some companies might pursue such strategies more as a reflexive next step—a natural, if not inevitable, progression of their expansion in China—than as a deliberate, well-planned initiative framed by clear goals and backed by the necessary resources. The impressive momentum of China’s biotechnology sector alone is not sufficient justification for multinationals to dive deeper.

A series of questions and considerations can help biopharma companies ensure that new-drug discovery initiatives are grounded in a clear rationale:

- **Are our business objectives in China clear?** Is the aim to learn more about a fast-growing market, so that the company can adjust its approach to reflect characteristics that are unique to China? Or is it to discover new drugs designed to satisfy unmet needs? There are shades of grey between these two extremes, but multinationals must be clear about their aspirations.

- **Are our scientific objectives well defined?** Ensuring that scientific objectives are clearly defined and not spread across too many disparate disease areas is almost a prerequisite for scientific success and is essential to avoiding a subscale effort—even more so in China, where drug discovery efforts are relatively small compared with the work done by multinationals.

- **Do our efforts have a high probability of success?** Bad ideas do not magically become good ideas when moved to China. There must still be a high bar for committing research funds to projects, and each initiative needs to have the full support of the leadership team.

- **Are we prepared to import talent to close gaps?** Filling key positions with Western-trained staff can be costly but is almost always necessary. Retention will also be an issue, given the competition for talent from other multinationals, as well as from local startups.

- **Are we committing sufficient financial resources?** While R&D is certainly cheaper in China, the level of investment should match the aspiration. Insufficient funding will show through in the final output.

- **Does this research align with our global R&D strategy and priorities?** In other words, would we invest in these same activities outside China? If not, there needs to be a compelling rationale for how China will offer a unique advantage.

- **At the same time, are we customizing our approach for China?** Companies that are planning to expand in new locations have an opportunity to create R&D organi-
an upbeat outlook does not absolve multinationals from the need to define clear objectives.

For the most part, these are questions that companies should ask of any research project anywhere in the world. The bottom line is simple: if a company would not consider doing a particular drug-discovery project in the U.S. or Europe, it should think very hard about why it wants to do it in China. Commitment is also critical. An underresourced, unfocused project risks destroying value by drawing resources and attention away from more promising drug-discovery efforts. Conversely, companies that develop a strategic approach to new-drug discovery in China will almost certainly gain an edge in China and the global pharmaceutical market.

China’s biopharma R&D sector has come a long way in five years. Local players have broadened their capabilities and continue to attract investments, while multinationals have become more sure-footed and are moving from simple outsourcing to strategic partnerships. Five years from now, we would not be surprised if our outlook—as optimistic as it is—turns out to have been understated. The growth potential of China’s R&D sector, coupled with multinationals’ appetite for innovation, makes for a powerful combination.

But an upbeat outlook does not absolve multinationals from the need to define clear objectives. Which end of the spectrum are they aiming for? Are they there to understand—and access—China’s fast-growing domestic market? Or are they there to spur innovation and harvest new drugs? For the latter option, in particular, it is critical that multinationals bring to bear the necessary resources, along with a long-term commitment to enriching their partnerships. This road has the potential to provide higher returns on R&D investments, but that is not enough of a reason to take it. Multinationals that cannot marshal the resources to support such an approach would be better off paring back their ambitions and focusing on other opportunities in China, such as externalizing R&D activities and creating networks, both of which are critical to capturing value from China’s explosive growth in R&D.
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