The Missing Link in Pharmaceutical R&D
Scientific Leaders Are Essential to Success
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EXECUTIVE SUMMARY

Despite more than doubling its spending on research and development over the last 10 years, the pharmaceutical industry’s success rate in finding new drugs has been disappointing. Yet new research by Booz & Company points to an unexpected and unheralded source of potential productivity—mid-level managers in the R&D function. Pharmaceutical companies can raise their productivity significantly by recognizing and activating the unique impact of leaders across the middle.

Leaders at this level have the ability to identify and enable the company’s most creative bench scientists, to cultivate new scientific insights, to identify and connect with the most promising external sources of innovation, to nurture and navigate promising ideas through complex organizational decision making, to reinforce an environment of top-quality science, and to keep the brightest minds engaged day in and day out. This group of managers represents an underutilized asset that could, if properly activated, lead to new breakthroughs in pharmaceutical productivity.
By nearly all measures, new drug discovery and development has been declining for more than a decade—even as spending by the largest companies has more than doubled. Why?

A wave of consolidation in the pharmaceutical industry over the past two decades has created larger companies with bigger product portfolios, but almost across the board, it has saddled discovery units with diseconomies of scale and too much bureaucracy to be effective. As a result, the capacity to generate new insights and make shrewd investment decisions has not grown proportionally and has even declined. The rate of new drug discovery over the past 10 years has been so poor that the head of one big pharmaceutical company has dubbed it the “lost decade.”

In an attempt to reverse this trend and increase productivity, innovative R&D organizations have deployed a range of different management, technology, process, and structural solutions:

- Earlier commercial involvement in project decision making in an effort to enhance focus on commercially relevant compounds
- More rigorous portfolio management procedures and increasingly stringent criteria for the adoption of new projects, including, for example, human genetic validation of new drug targets, or decisive results from knockdown or in vivo gene manipulation
- Clearer guidelines for handover from discovery to development, and the growth of translational research capabilities
- More sophisticated and comprehensive incentive and reward structures
- New structural solutions that rely on more external partnerships for discovery and outsourcing of “non-core” activities

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For example, some large R&D organizations have begun to create smaller, more accountable units, but that alone has proven insufficient. In 2008, GlaxoSmithKline (GSK) divided its research and development function into small groups of up to 80 scientists to try to create the innovative atmosphere and close working relationships of a biotech startup.1

While these approaches have contributed to more efficient research and deserve attention, they have not been able to promote and nurture the kind of new insights that lead to more effective drug discovery.

Most breakthrough insights come from the work of individual scientists who connect their own deep expertise in one domain with ideas from another discipline. Most notably, in a speech delivered in 1922, titled *How I Created the Theory of Relativity*, Einstein credited his insight to his discussions with Swiss/Italian engineer Michele Besso, with whom he “did battle against that problem.” The most creative scientists will propose new ideas based on their expertise and input from other disciplines, recombining facts and ideas into new insights.

The role of scientific leaders, therefore, is not only to encourage scientists to strengthen their core areas of expertise but also to identify the scientists who have the greatest potential for breakthrough insights and help them interact and explore adjacent fields, creating the opportunities for breakthroughs in the pharmaceutical space and creating ideas that offer the promise of differentiated treatment of human disease.

But the leadership challenge is stark. Industry-wide consolidation has led to larger research organizations, where senior leaders are now managing significantly more projects, limiting their ability to generate deep insight, explore multiple avenues, or make informed decisions. Senior leaders cannot know all the scientists, encourage them, or easily identify significant scientific insights. As a result, middle managers have become an increasingly critical linchpin in research productivity.

Our team at Booz & Company recently interviewed 20 senior executives at 15 leading research-based pharmaceutical companies and academic institutions. We asked them a question: How can better management of R&D solve the productivity challenge? Almost all the conversations led us to the critical void of scientific leadership in research. We realized that the leadership challenge is most acute across the middle of the organization, and we discovered that pharmaceutical companies could raise their productivity significantly by selecting, developing, and enabling strong scientific leaders at that level.

Middle managers in the research division of pharmaceutical companies are key because they have the ability to identify and enable their most creative bench scientists to cultivate new scientific insights, nurture and navigate promising ideas through complex organizational decision making, and keep the brightest minds engaged day in and day out. These leaders, who are frequently responsible for multiple programs that report to a therapeutic area head or lead functions, offer a huge leverage point in the decision-making structure, making thousands of day-to-day decisions about what to support and what not to support.

Regardless of other variables—such as an open innovation sourcing strategy, organizational structure and alignment, or other systems
and tools—our team observed that internal discovery output per dollar can be vastly improved, and downstream attrition reduced, by addressing the scientific leadership across the middle of the organization. Indeed, one reason that all the investments in organization, tools, technology, and techniques have not delivered additional insight is that the investment in the leaders using them has lagged. Furthermore, the recent wave of outsourcing, restructuring, and merging has caused companies to take away capacity across the middle of the organization. And even where middle managers do exist at some concentrated level in an organization, their roles are often not well defined. Therefore, our research revealed that successful pharmaceutical companies focus on the following three elements.

1. Clearly differentiated roles for senior, middle, and project managers
The role of leaders across the middle should be clearly defined and differentiated from senior leadership and department or project managers. However, the roles of scientific leaders across different levels frequently overlap, blurring responsibilities and activities and leaving organizations unable to take full advantage of the unique contributions that each role offers. Leaders across the middle frequently mirror either the senior leadership or the project management role but rarely reflect the unique needs of their own position. Some leaders in middle management adopt the decision patterns and management approach of senior leaders, managing resource allocation through formal reviews and relying primarily on checklists and common criteria. Alternatively, leaders across the middle either feel their responsibilities are squeezed by their own senior leaders or rely on their familiarity with prior roles and responsibilities. As a result, middle managers frequently continue to manage projects, often duplicating the role of the project managers.

2. A focus on the pivotal roles across the middle
To be successful, companies must focus more attention on the pivotal role of leaders across the middle of the organization. Managers in these roles typically oversee 100 to 200 direct reports. As a result, leaders can develop a personal relationship with most of the people in their organization. These groups also have sufficient scale to develop expertise, create opportunities and connections for serendipity, and marshal resources to support good ideas. Individual scientists or teams may generate new insights, and senior leaders may devise effective strategy, but groups of 100 to 200 scientists have the depth, critical mass, and diversity (via internal and external connections) to deliver results. Middle-level managers can best select and increase opportunities for these scientists and guide them through the organization to make sure that good ideas aren’t knocked out too easily in an abstract criteria-based process.

3. Developing critical skills within the middle management group
In order to lead scientists, managers must have personal scientific credibility. However, this is not enough. Those who rise to the challenge of being strong scientific leaders differentiate themselves in four key ways:

They define a compelling destination.
When Tom Hughes, now president of Zafgen, launched the early work on Novartis’s DPP-4 inhibitor that produced the company’s successful type 2 diabetes drug, he knew it was a challenging project that would require resilience, creativity, and support from scientists across the organization. To maintain commitment and tap into discretionary efforts, he and his team created the Manifesto for DPP-4 that not only set forth the target research profile but also described the clinical benefits for patients. Among other things, the vision captured in the manifesto enabled bench scientists to link their daily work directly to the desired outcome and helped them to “keep the end in mind” as they considered how to work around inevitable obstacles. Launched in 2007, the product has been approved in 68 countries.

They connect beyond boundaries.
Many scientific leaders recognize that functional silos, highly specialized scientific knowledge, and uneven communication skills create barriers to critical networking interactions that are at the heart of innovation. “Creativity is simply the art of putting two well understood ideas together in a new way,” according to Phillip Sharp, founder of Biogen and winner of the Nobel Prize in physiology, “and making connections through networks is central to innovation.” For that
Successful scientific leaders use informal channels to understand the different strengths of their people and learn what motivates them.
PUTTING IT ALL TOGETHER

To put these ideas into practice, senior leaders will need to first assess the current state of their scientific leadership and then create a systematic capability to generate great scientific leaders and enable them to have maximum impact. Specifically, senior leaders need to identify which opportunities, organizational groups, and projects could benefit the most from strong scientific leadership and build an explicit shared commitment to developing a group of scientific leaders. A successful scientific leadership development initiative, which, in the words of David U’Prichard, the former head of R&D at SmithKline Beecham, “is a novel exercise for most pharmaceutical research organizations,” will include the following:

- A diagnosis of current managers across the middle, including functional and project management leaders, assessing their scientific leadership skills and track record of achievement
- An assessment of the gap between the number of current and potential scientific leaders and the number required—a “talent gap” analysis
- The creation of an organizational environment in which scientific leaders across the middle can develop and thrive

Lessons from the world’s most innovative companies reveal that creating an environment where
leaders across the middle can thrive involves these elements:

- Developing structured “white space” programs that catalyze lateral thinking, ranging from workout sessions where project teams in different therapeutic areas that share common biological pathways jointly address scientific problems, to “challenge sessions” with scientists in other disciplines.

- Defining the role of managers across the middle versus project teams, sub-function managers, and senior executives, as well as adjusting spans of control at the function, sub-function, and group/section leader levels to ensure the right balance between being close to the science and the people and having an appropriate breadth of responsibility to influence resource allocation decisions.

- Designing systems and measures of performance to track and reward contributions to the success of others and other teams as well as to a leader’s own team, to reinforce interaction and collaboration internally and externally; and removing barriers to effective scientific leadership including, for example, simplification of complex matrix management processes such as “contracting” for resources between functions and project teams.

These changes will require support in the form of a new role for human resources, as well as a different role for senior managers in talent development. As Severin Schwan, CEO of the Roche Group, has said, “Innovation is ultimately a talent business.” And talent at the middle of the organization is key.

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Our analysis of Booz & Company’s proprietary research confirmed the widely perceived decline in pharmaceutical R&D productivity and revealed that while no one company has a sustained record of success, there are pockets of excellence. We then convened a roundtable with four recent leaders of global R&D organizations and concluded that few structural or process solutions have delivered their promised results because of a gap in scientific leadership. Further interviews with more than 20 leaders in R&D not only confirmed the leadership gap but also revealed specific leadership requirements and the need to focus on middle managers. An informal gathering with senior HR leaders in R&D identified specific ways in which organizations can expand scientific leadership capacity across the middle of the organization.

**Key Findings**

- Drug development success has been declining for more than a decade, despite increasing investment in research and development.

- Innovative R&D organizations have deployed a range of different management, technology, and process solutions to increase productivity—with uneven success.

- Our research showed that pharmaceutical companies could increase productivity by selecting, developing, and enabling strong scientific leaders across the middle of the organization.

- Successful companies must focus on the pivotal role of leaders across the middle of the organization. These are frequently the positions with approximately 100 to 200 direct reports.
About the Authors

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Endnotes

Booz & Company is a leading global management consulting firm, helping the world’s top businesses, governments, and organizations.

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Today, with more than 3,300 people in 61 offices around the world, we bring foresight and knowledge, deep functional expertise, and a practical approach to building capabilities and delivering real impact. We work closely with our clients to create and deliver essential advantage.

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