CAHRS Working Group
HR for R&D

Hosted by Bristol-Myers Squibb
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Participating Organizations:

Amgen
Archer Daniels Midland
Boehringer Ingelheim
Bridgestone
Bristol-Myers Squibb
Colgate-Palmolive
Cornell University
Corning
Ecolab
General Mills
HP Inc.
Johnson & Johnson
Merck & Co.
Nissan
Proctor & Gamble
Stanley Black & Decker

Key Takeaways:

- While earlier generations of scientists may have seen going to industry as a "second-best" career alternative, it is increasingly the preferred career of younger generations.
- The importance of doctoral level training to breakthrough innovations and the size of this workforce differs across industries and fields. Ph.D. level scientists comprise a large share of the workforce in bio/pharma, chemical products, food science, and advanced materials Research & Development, and a smaller share in electronics and consumer products.
- The motivations of scientists — regardless of level of education — tend to be different from those in other occupations. The needs for individual creativity, autonomy, and recognition often outweigh the need for pay. However this may be changing and younger generations show greater need for quality-of-life benefits and amenities.

Opening Comments

This was an inaugural working group — the goal of which was to identify the common interests and needs among HR professionals who support the innovation or Research & Development function within a science- or technology-based business.

The meeting was focused on Ph.D. level scientists and engineers working on breakthrough innovations. Bristol-Myers Squibb hosted the event and opened by remarking on the physical environment – a traditionally appointed corporate board room – as being the antithesis of what was appropriate for the topic and quite different from the R&D physical environment.

This led to a brief acknowledgement about the role of physical space for creativity and innovation and a recognition that many of the participating companies had or were currently renovating their offices and laboratories and many were moving R&D to industry clusters such as Cambridge, MA or Silicon Valley.

After introductions were made, the group collectively generated an agenda of items that it hoped to cover. The organizing questions that were distributed in the initial call for participation were used as a starting point to talk about why the participants had come together and what they hoped to accomplish.

Initial Insights & Implications

Insight	Implication
Many companies have an HR business partner assigned to the R&D function, but it is not commonly recognized as a sub-discipline within HR.	We will achieve mutual benefit by creating a community of practice for HR for R&D.
It is common for HR professionals within the biotech & pharmaceutical industries to convene and share best practices for managing scientific innovation. There are also convening of Silicon Valley tech company HR professionals. But there is little cross-pollination.	There is unique value to be gained by sharing insights across industries and geographies.
There is strong evidence from academia that managing the innovation function, and managing scientific and technical professionals, poses unique challenges, but this information is not widely disseminated or adopted in practice. There was strong interest among the participants in learning more about insights gained from research and how they might be applied to the management of R&D personnel.	There is valuable mutual learning that will occur by bringing academics and practitioners together.

The day focused on three main topics:

1. Creating an organizational structure & culture for breakthrough innovation,
2. Attracting and selecting Ph. D. talent, and
3. Careers, promotion and retention of Ph. D. talent

The group then spent some time defining innovation:

- **Breakthrough** vs. Incremental
- **Revolutionary** vs. Evolutionary
- **Product** vs. Process
- **Truth-seeking** vs. Progress seeking

Note: In all cases, we are interested in the former, but it is worth recognizing that because innovation has become a ubiquitous term, colleagues and commentators may be talking about very different things.

A useful distinction came from a *Nature Review* article distributed as background reading*:

The authors, BCG consultants, describe a study of drug discovery was cited where they examined 842 individual molecules across 419 companies to understand what factors led to ultimate success, noting:

> "There is a strong bias in most R&D organizations to engage in what we call 'progression-seeking' behaviour. Although it is common knowledge that most R&D projects will fail, when we talk to R&D teams in industry, most state that their asset is going to be one of the successes. Positive data tends to go unquestioned, whereas negative data is parsed, re-analysed, and, in many cases, explained away. Anecdotes

of successful molecules saved from oblivion often feed this dynamic. Moreover, because it is uncertain which assets will fail, the temptation is to continue working on them. This reaction is not surprising when one considers that personal success for team members is often tied closely to project progression: it can affect job security, influence within the organization and the ability to pursue one's passion. In this organizational context, progression-seeking behaviour is entirely rational.

We have seen success in changing this outlook by changing the organizational context of R&D teams so that 'truth-seeking' rather than progression-seeking becomes a more rational behaviour for individuals and teams. Teams are rewarded (in terms of job security, organizational status, compensation, and so on) not for progressing their asset but rather for revealing the scientific truth about the asset as accurately and efficiently as possible. Governance is likewise characterized by an emphasis on return on investment and a culture of enterprise value creation."

*Michael Ringel, Peter Tollman, Greg Hersch and Ulrik Schulze (2013) "Does size matter in R&D productivity? If not, what does?" Nature Reviews: Drug Discovery, volume 12, pages 901-902.

Creating an Organizational Structure & Culture For Breakthrough Innovation

The day started with a presentation by a CAHRS organization's cultural and organizational transformation in drug discovery teams and lessons learned from the pharmaceutical industry. As a group, CAHRS partners discussed similarities and differences across different industries — which required some translational language — and discovered that most companies, across all industries emphasized the importance of *cross-functional teams* as the vehicle for breakthrough innovation. Notably:

- Some companies reorganized around projects as opposed to functions/disciplines;
- Some had separate innovation units that were explicitly designed to be cross-disciplinary; and
- Some had temporary units or elite "special forces" teams that brought different kinds of expertise together to develop truly innovative products and then disbanded.

Examples:

1. In a bio/pharma company, reorganizing around projects required a fundamental change in resource allocation processes and decision making. Historically R&D had been organized around disciplinary departments. It then shifted to disease targets as the organizing unit and brought different disciplines together with budgets, incentives and rewards located within the new units. An important cultural shift was having the company focused on making good scientific decisions about which projects to continue and which to end.

This change was illustrated with the following description:

Before	After
Projects seeking funding and support to continue would come with a polished presentation – up to 100 slides in a deck. The presenter was the "expert" and came prepared to answer any and all questions that might be posed.	Projects are frequently presented and reviewed. The presentation is explicitly "work-in-process" and the framing is "we need your input." Debate and discussion is encouraged. The idea is to take advantage of broad scientific expertise and make good scientific decisions that are in the best interest of the company.

2. A product R&D organization in one company has always worked through cross-functional teams where project leaders could request particular staff members to work on new projects. This led to perceived patterns of favoritism and inclusion/exclusion. Now HR is involved in reviewing staffing requests to monitor inclusion/exclusion. Sometimes HR asks, "Why is this person not being called upon?" This is a limit to leader autonomy that can be frustrating, but is deemed necessary and seems to have led to better outcomes in terms of both product development success and employee satisfaction and retention.
3. Another CAHRS company formed an elite "tiger team" to work on a future-oriented new product that would cut across existing business units. The team of 10 people was carefully selected to be totally cross-functional and included internal elite talent and specially recruited new talent. The team was sequestered in a new open-concept physical space that was designed for collaboration and creativity. They were physically isolated from the rest of the company and had a separate budget to work with. They were asked for quarterly check-ins, but deliberately treated differently from other product development teams. All of the HR processes, incentives and rewards were different. They wanted the team to be recognized and rewarded for progress so offered spot recognitions and compensation throughout the project, not just on delivery. The HR business partner who oversaw the team believed that they would not have come up with as radical a breakthrough in the context of existing processes because "the ideas would not have been as radical, and early failures would have led people away from the more challenging project."

There was vigorous discussion and debate about:

- Whether scientists should stick with projects from inception through completion/commercialization or whether people are better suited to different phases of a project;
- The pros/cons of permanent versus temporary innovation teams;
- Whether breakthrough innovation should reside centrally, within business units, or both; and
- Whether the innovation function should be separated out and treated differently, or whether the core HR and management systems should be rebuilt to embed innovation throughout the organization.

There were several noteworthy practices mentioned by participants:

- A funding mechanism where business units contributed to an "incubation" fund that provided resources for new innovations;
- An internal "crowd-sourcing" platform that allowed all employees to contribute ideas;
- An internal "shark-tank" competition where teams competed for resources to develop product ideas; and
- A reward program that allowed selected innovators to drive a company-owned Tesla for a month.

Attracting and Selecting Ph. D. Talent

There were two sub-topics in this discussion:

1. Recruitment & Selection, and
2. Careers, Promotions, and Retention

Recruitment & Selection

The group's discussion of recruitment and selection was stimulated by a research presentation by Cornell Professor Michael Roach about a National Science Foundation sponsored study of STEM doctorates and career preferences.

Some key insights from this presentation & discussion:

- While earlier generations of scientists may have seen going to industry as a "second-best" career alternative, it is increasingly the preferred career of younger generations;
- The importance of doctoral level training to breakthrough innovations and the size of this workforce differs across industries and fields. Ph.D. level scientists comprise a large share of the workforce in bio/pharma, chemical products, food science, and advanced materials R&D, and a smaller share in electronics and consumer products;
- The motivations of scientists — regardless of level of education — tend to be different from those in other occupations. The needs for individual creativity, autonomy, and recognition often outweigh the need for pay. However this may be changing, and younger generations show greater need for quality-of-life benefits and amenities.

There was vigorous debate and discussion about:

- The use (and usefulness) of non-compete agreements. Some companies have all employees sign them; some never use them; some make strategic decisions about which categories of employees are subjected to non-competes — both in signing them and in enforcing them;
- The legal challenges associated with employing independent contractors; and
- The strategy of partnering with particular universities to source specialized talent.

Careers, Promotions, and Retention of Ph. D. Talent

The participants' discussion of careers opened with a case study of one of the CAHRS partner company's process for promoting scientists to the highest rank of "Corporate Research Fellow." Many of the participating firms reported to have a system of "dual career ladders" with a managerial track and a technical track. The processes for advancing along the technical track tended to mimic academic promotion and tenure systems with elaborate documentation requirements, long time-in-rank, and peer-review committees instead of managerial discretion.

Several questions and concerns were raised in the discussion:

- A technical career ladder may be an outmoded system that is ineffective in motivating future productivity and results in senior researchers with big salaries and titles who may not be innovative or productive (concerns which are similarly voiced by critics of the tenure system in universities);
- Advancement along a technical career ladder is currently perceived as the only way to be recognized for scientific ability and achievement, but there may be more effective ways to give scientists the recognition they seek as part of a managerial career ladder that does not take them as far away from science/technology;
- Because it tends to be easier to be promoted on a managerial track, ambitious technical talent switches over to management and abandons science. This may not be the best use of highly trained and skilled scientists. One participant described a prior employer that carefully matched the steps on the career ladder for the technical and managerial tracks and was assured that there were no differences in the difficulty or timing of promotions across the tracks as being one way to solve this problem;
- The switch may be driven in part by number of available "spots" at the highest rungs of each track. One participant described a system where there were only a handful of technical "fellows" — the highest level on

the technical track — as compared to several hundred vice presidents — the highest level on the managerial track;

- The group concluded that there seems to be a discrepancy in the philosophies associated with promotion in the managerial track as compared to promotion in the technical track. Managers are promoted to larger and more challenging roles based on their potential. Technical people are promoted based on demonstrated prior achievements and their time with the company; and
- The group concluded that there was an urgent need to reinvent career journeys to reflect the modern, agile, connected, 24/7, global multi-generational world in which we are working.

This Summary Report was prepared by Diane Burton and Michael Roach for use by participants of the HR for R&D Working Group.

The Center for Advanced Human Resource Studies (CAHRS) is an international center serving corporate human resources leaders and their companies by providing critical tools for building and leading high performing HR organizations. CAHRS' mission is to bring together Partners and the ILR School's world-renowned HR Studies faculty to investigate, translate and apply the latest HR research into practice excellence.

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