



The New Scientific Workplace: Getting More with Less

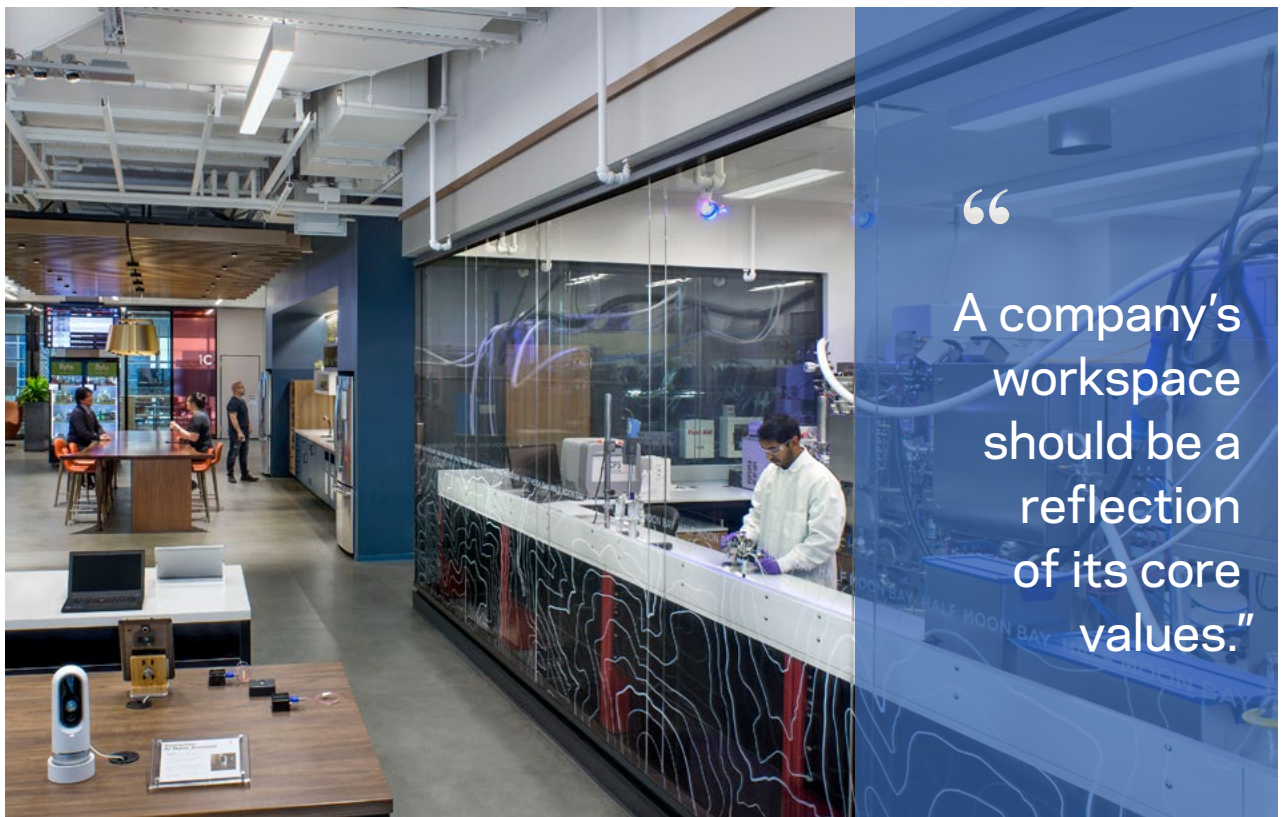
an HOK White Paper by Tim O'Connell, AIA

Tomorrow's research organizations need to be agile, efficient and effective to keep up with the demands of shareholders and customers.

summary

Speed to market continues to be the benchmark of success and many factors, not least of which is innovation, will test traditional ways of working. While the basic principles and function of research will not change significantly, the path toward discovery is continually evolving as complex problem-solving increasingly requires scientists to form large-scale collaborations.

The new scientific workplace will focus on the intersection of people—more “we” and less “me.” Science is changing from an individual activity to a team sport. Designing highly collaborative scientific workplaces can inspire cultural shifts in research-driven organizations. These organizations are finding they achieve better results as they bring more people into contact with each other.



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The Importance of Culture

An organization's culture plays as large a role in the ultimate design as blueprints. For lab planners and designers, it is absolutely crucial to understand an organization's culture long before the first sketch. A company's culture is its DNA—it constitutes the building blocks of what it is and what it strives to be. A company's workspace should be a reflection of its core values.

Establishing an initial meeting with an organization's leadership is one of the most efficient ways to gauge company culture. This meeting also serves to provide planners with an understanding of how decisions will be made and approved throughout the project. For example, is this institution beholden to one ultimate decision-maker, or does it make decisions by committee? Projects become more complex as more people and groups are added to the decision-making process. Thus, planners must establish a firm schedule and be clear in the desired planning and programming approach. Setting these goals ahead of time will help ensure a project is completed on time.

Another way for designers and planners to immerse themselves in a company's culture is to spend a "day in the life" of the client. Understanding how employees use—and don't use—their current space is essential as it allows designers to envision future changes based on efficiency.

The day-in-the-life exercise is also beneficial for employees, some of who will be undergoing intimidating changes to their worklife. An exercise like this can give employees a better perspective on what they truly need in the workplace versus what they have simply grown accustomed to.

Precedent tours are also a critical part of the laboratory planning and design roadmap as they provide a common framework for decision-making. During precedent tours, client representatives visit other labs with their planners and designers to green-light elements that can be incorporated into the ultimate design or determine which elements will not work for their project. This activity helps stakeholders to define a common design language.

The Influence of Startups

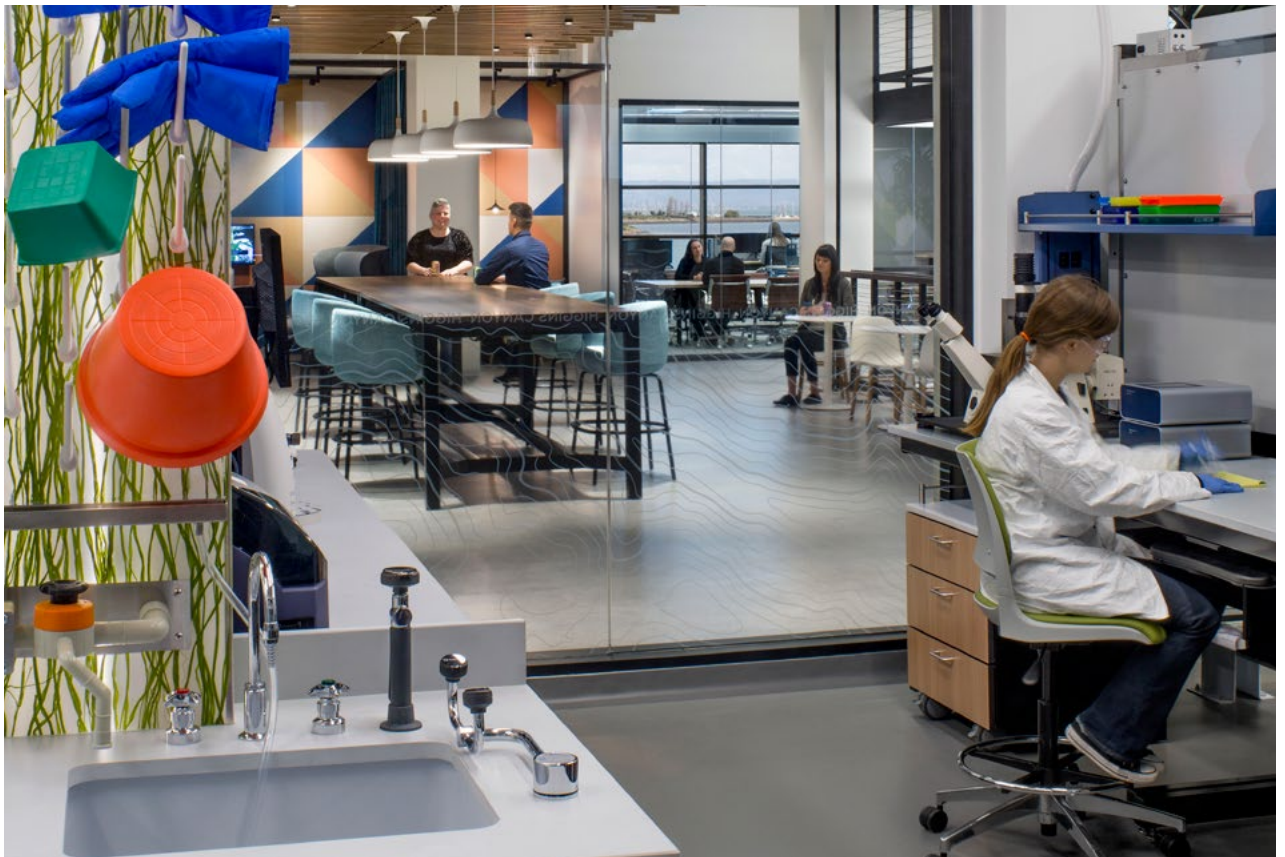
Recently, laboratories in the scientific space have begun to adopt design principles typically used by startup companies. Open workspaces, dedicated project areas, innovation hubs, and shared support areas are all examples of design features associated with companies looking to enhance speed to innovation.

Recruitment and retention of top talent is one driving factor behind this sudden adoption. According to a University of North Carolina study, Millennials will comprise nearly half (46 percent) of all U.S. workers by 2020—and that number will continue to rise. Millennials have come to expect much different work spaces than the

generation before them—Generation X—which represent just 16 percent of today's workforce.

Millennials thrive on flexibility and technology options. They also tend to be more social and work in teams more than previous generations, which requires designers to rethink traditional lab spaces.

The new scientific workplace must meet multi-generational workforce needs, support a more mobile workforce, introduce new and varied modes of collaboration, and integrate emerging technologies.



Planning + Design Trends

Activity- and project-based space

In recent decades, the traditional workplace—defined by segregated spaces of closed offices and cubicles—has been supplanted by more open environments that bring all employees together with the goal of spurring collaboration and reflecting a less hierarchal culture. Today a popular compromise on those two strategies can be found in the concept of workplace neighborhoods. This design features smaller work groups clustered in a single location. HOK has found an ideal neighborhood size anywhere from

25 to 45 people has proven successful. Groups of this size allow employees access activities with spaces designed for solo work, collaboration, learning, socializing and rejuvenation.

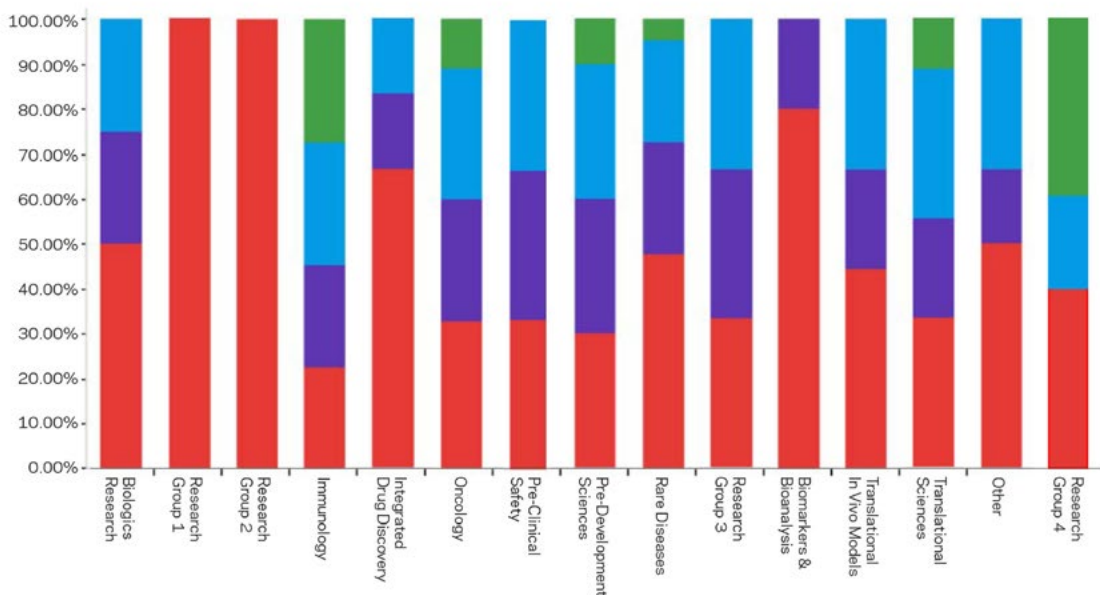
Today's challenges are often solved in an interdisciplinary manner. So pairing, say, chemists with biologists facilitates adaptive, productive research. This "team science" approach enables a "fail fast" mentality to prototyping-another startup principle scientific organizations have used to catalyze innovation.

Where do you collaborate?

Question:

Which of the following best describes how you collaborate, interact or share knowledge and ideas in the lab environment?

- Informal discussions at the lab bench
- Team or project meetings inside the lab
- Video or conference with remote colleagues
- Other



Hyper-flexible Spaces

Many R&D employees are now working remotely part of the time thanks to advances in portable technology and communication tools.

In today's world, efficient workplaces are flexible and nimble, supporting heads-down work, one-on-one discussions, video conferencing, discussions over drinks/food, brainstorming, and many other unpredictable moments that support the complexity and variety of scientific work. Researchers need options - hence the demand for flexible space that can be customized to meet the task at hand.

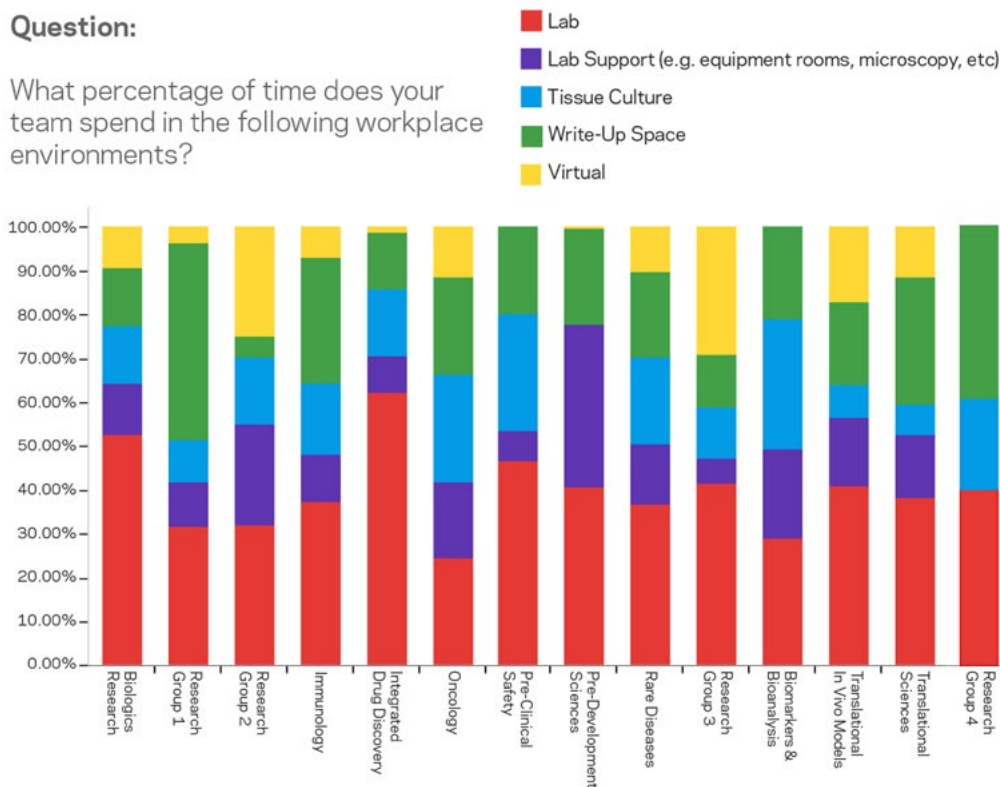
Eliminate hierarchy, support organic growth
In designing flexible laboratory spaces, corporate life-science projects are moving away from the hierarchical status quo of the past.

The paradigm shift away from this model dispels the notion that researchers should be sequestered in different buildings and different campuses with enclosed offices. Instead, planning laboratory spaces by activity, not department, has been shown to increase the rate of discovery.

Where do you spend your time?

Question:

What percentage of time does your team spend in the following workplace environments?



More We, Less Me Space

Ultimately, all of these trends roll up into one prevalent idea: “more we, less me” space. In recent years, lab planners and designers have seen a significant drop in private, enclosed and individually assigned “me” space. In many cases there are no private offices in modern

workplaces. As the percentage of “me” space has declined, the amount of “we” space has increased to accommodate focused and activity-based work. These workspaces also allow much more spontaneous collaboration than private offices, encouraging creativity and group problem solving.

Case Study: East Coast, USA

HOK was contracted by one of the largest pharmaceutical companies in the world to work on a 1-million-sq.-ft. project that consolidated eight of its laboratories into one central facility. As researchers from across departments and disciplines would all be working in this single location, HOK’s lab planners pursued an activity-based workplace that could support the needs of a diverse mix of teams and individuals.

The design team began by creating a survey that asked employees to answer these vital questions:

- 1) Where do you spend your time?
- 2) Where do you collaborate?

The 108 responses from across 14 different departments had some surprising results, nearly 70% of researchers’ time was spent in labs and lab support spaces and an increasing amount of collaboration was occurring in the lab environment, at the bench and in-lab collaboration areas. The activity-based programming tool revealed which research activities demanded the most usage, and among whom. The answers plotted across heat maps and bar charts were used as the basis for planning Centers of Excellence (CoE) within the new centralized facility.

Peer Research Metrics	Confidential Client 1 Midwest	Confidential Client 2 Europe	Confidential Client 3 California	Confidential Client 4 East Coast	Confidential Client 5 California
Ratio: Wet to Dry Research	5 to 1	6 to 1	All Wet	1.3 to 1	2 to 1
Area per Researcher	384	370	218	150 Includes Workstations	295
Office Size: Investigator	110	135	NA	NA	120
Work Station Size	42	42	30	30	36
Lab Bench ELF per	5	5	5	12 or 9	7
Work Stations: In or Outside of Lab	Outside	Outside	Outside	Outside	Outside
Core Lab	Imaging	Imaging NMRs HTS/CM Vivarium	Biorepository Cell Culture	Chemistry Biology	NA
Ratio: Lab to Lab Support	2 to 1	2 to 1	1.8 to 1	2.3 to 1	2.5 to 1
Net Assignable Square Feet	16,000	380,000	62,547	145,672	188,600
Gross Squar Feet	25,000	570,000	105,728	273,000	310,000
Net to Gross	55%	67%	59%	53%	61%
Completion	2015	2017	2018	2017	2019

Industry Space

To further understand industry trends and where lab planning and design is headed, HOK has established benchmarking for more than 20 corporate life sciences projects completed in the last 10 years.

Benchmarking revealed that the average workstation was 37 sq. ft, while the average area per researcher was 232 sq. ft. Although the recent trend of “less me, more we” space might suggest less space per researcher, that’s not exactly how the data shakes out. It’s not less space per person, rather how that space is allocated per person that is the difference.

For example, for a biopharmaceutical company based in San Francisco, office workspace density was targeted at 75 sq. ft. per person. On the laboratory side, the planning team added 130 sq. ft. for lab and lab support (for a total of 205) per researcher. In actuality, the design of this project culminated in 218 sq. ft. per laboratory person—very close to the planned goal of 205.

The lesson? Integrating benchmark data and an institution’s standard workplace guidelines into planned lab standards that support said guidelines, can lead to incredibly efficient and effective scientific workplaces.



Conclusion

Scientific breakthroughs are more often the product of teamwork rather than individual efforts—the scientific workplace should reflect that reality.

The scientific workplace of the future will focus on the intersection of people—more team-focused environments. It will bring together all types of researchers in environments that make it easy to see each other, talk to each other, work with each other and celebrate each other's accomplishments.

The most effective ways to do this is by creating neighborhoods and planning activity- and

project-based spaces. Creating environments that support both individuals and teams allows for sparks of ideation, fosters germination of thought, and encourages the exchange of ideas that enables divergent co-creation.

The scientific workplace is undergoing a paradigm shift away from private spaces toward highly collaborative ones that reflect cultural shifts and trigger innovation. More and more research-based organizations are finding a direct connection between encouraging collaboration—through laboratory design and culture—and an increased rate of discovery and innovation.



About the Author

Tim is a director of HOK's global Science + Technology practice. A key member of HOK's studio in Washington, D.C., he has more than two decades of experience as an architect and extensive knowledge about lab planning and programming for complex research facilities.

Tim has served as lab planner, lab architect, project manager and project architect on numerous research facility projects, including the

DC Consolidated Forensic Lab Facility, a LEED Platinum building that won the R&D Magazine Lab of the Year Special Mention Award for Collaborative Science.

Tim frequently speaks on the topics of research facilities and scientific workplaces and has published articles about sustainable design and lab design.



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HOK's research facility and laboratory planning specialists create paradigm-shifting projects that advance innovative scientific discovery in buildings of every shape and size.

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