



Top firms bring out creativity, growth in their scientists



Thriving biotechnology and pharmaceutical firms share philosophies when it comes to driving innovation, encouraging professional development, and respecting employees' work-life boundaries. These employers know that strategic alliances should serve to keep them on the cutting edge, and that scientists should be given the space, freedom, and resources to explore their riskiest and most creative ideas. They place a high priority on the professional growth of their scientists, and provide them with opportunities to add technical skills and expand leadership responsibilities. And when a long day of pushing projects forward is over, these workplaces make sure they pamper their researchers with celebratory downtime and easy ways to stay active, healthy, and connected—and even ice cream trucks in the summertime. **By Kendall Powell**

Drug discovery is turning a corner in creativity—seeking to solve more unmet medical needs with approaches that come from biological rather than chemical solutions. These drugs include more sophisticated antibody therapeutics, but also encompass messenger RNA (mRNA)-based drugs; immuno-oncology therapeutics that fight cancers with designer, supercharged T cells; and truly personalized medicine, such as tumor vaccines designed to attack individual tumors. At the same time, applying big data bioinformatics to human genomes annotated with a lifetime of physicians' notes from each patient is revealing novel targets and helping tailor optimal treatments to patients.

The modern era of biopharmaceutical projects requires a level of creative thinking that goes far beyond traditional, chemistry-based drug discovery. So it's no surprise that scientists rank the highest satisfaction in industry jobs that let them flex their creative muscle, giving them the freedom to pursue risky ideas and the resources to test those ideas out at top speed. This year's *Science Careers* Top Employers—leaders in the biotech, biopharmaceutical, and pharmaceutical industries—excel at all three. They also share a dedication to innovation that is pushing biological boundaries, and they prioritize career development that stretches employees' skills and talents. Last but not least, they encourage healthy levels of work-life integration to keep employees productive and performing at their best.

This year's results

The top 20 employers of 2016 include companies with rich heritages in drug development that have embraced globalization, as well as relative newcomers with agile, fast-paced programs.

Regeneron Pharmaceuticals (No. 1) returns to the top spot in a continued show of force, having been named No. 1 or No. 2 for the last six years. The 28-year-old company's fully humanized antibody technology has ripened into a pipeline of a dozen such candidates in clinical trials. Ranked No. 2 this year, Novo Nordisk builds on its tradition of more than 90 years of leading diabetes health care. Based in Bagsværd, Denmark, the firm has parlayed that experience into innovations that help patients deal with other chronic conditions: hemophilia, growth disorders, and obesity.

After its debut in the survey at No. 7 last year, Moderna Therapeutics has rapidly moved up the ranks into the No. 3 slot. Headquartered in Cambridge, Massachusetts, Moderna is just five years old and has about 460 employees. But it is a powerhouse of innovation that has quickly turned its mRNA technology platform into two infectious disease mRNA-based vaccines, which are already being tested in early clinical trials. Moderna expects several other internal and partnered candidates to be in human trials by the end of 2016.

Each year, leadership in innovation has been named one of the major drivers of the top firms. However, this year, survey respondents also chose "having a clear vision" as one of the strongest characteristics of the best employers. **George Yancopoulos**, president of Regeneron Pharmaceuticals, as well as its chief scientific officer and founding scientist, says Regeneron's success is largely due to a vision that hasn't changed since the company was founded by Leonard Schleifer in 1988.

"Our vision focuses on three things: teamwork, innovation, and translation. We believe being committed to all three is the best way to do science," he says. **cont>**

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Top twenty employers



The 20 companies with the best reputations as employers and the top three driving characteristics for each company, according to respondents in the 2016 survey undertaken for the Science/AAAS Custom Publishing Office. The companies without a 2015 rank did not receive enough mentions to qualify or did not receive a high enough ranking during the 2015 survey.

2016 Rank	2015 Rank	Employer (Global headquarters)	Innovative leader in the industry	Treats employees with respect	Has loyal employees	Work culture values aligned	Is socially responsible	Has clear vision
1	2	Regeneron Pharmaceuticals (Tarrytown, NY)	✓				✓	✓
2	3	Novo Nordisk (Bagsvaerd, Denmark)	✓		✓			✓
3	7	Moderna Therapeutics (Cambridge, MA)	✓	✓				✓
4	11	Eli Lilly and Company (Indianapolis, IN)		✓	✓		✓	
5	4	Vertex Pharmaceuticals (Boston, MA)	✓	✓		✓		
6	1	Novozymes (Bagsvaerd, Denmark)	✓		✓	✓		
7	6	Genentech (South San Francisco, CA)	✓	✓				✓
8	5	Alexion Pharmaceuticals (New Haven, CT)	✓				✓	✓
9	13	Biocon (Bangalore, India)	✓				✓	✓
10	8	Roche—excluding Genentech (Basel, Switzerland)		✓		✓		✓
11	17	Merck KGaA (Darmstadt, Germany)		✓	✓	✓		
12	10	AbbVie (North Chicago, IL)	✓	✓	✓			
13	9	Monsanto Company (Creve Coeur, MO)			✓	✓		✓
14	–	Syngenta (Basel, Switzerland)			✓	✓	✓	
15	14	Abbott (Abbott Park, IL)		✓	✓	✓		
16	15	Boehringer Ingelheim (Ingelheim, Germany)		✓		✓		✓
17	12	Celgene Corporation (Summit, NJ)			✓	✓	✓	
18	16	Bayer (Leverkusen, Germany)	✓			✓		✓
19	–	Novartis (Basel, Switzerland)	✓	✓				✓
20	–	Johnson & Johnson (New Brunswick, NJ)	✓	✓	✓			

The company's 5,000 employees are encouraged to contribute ideas from any level—but they can't be shy, because rigorous critique is considered the company sport. "Twenty or thirty or forty of us will develop an idea together in a room by arguing it out," says Yancopoulos. "That's going to give us the best chance for success."

The other part of Regeneron's ethos is speed—it is a company of fast talkers and fast doers. "How fast things are happening around here makes Regeneron a great place to work," says **Christos Kyratsous**, associate director of both the Infectious Diseases and the Viral Vector Technologies group. "I've been here only five years, and I've seen four molecules progress to development and some even to approval." This is a rare and lucky thing in the pharmaceutical industry, he says. Regeneron boasts one of the highest percentages of revenue going back into R&D in the industry, at just over 39% in 2015.

Several of the other top employers are big pharmaceutical names that have stayed nimble by looking outward to partnerships, expanding their global footprints, and of course, betting big on biology. Indianapolis-based Eli Lilly and Company (Lilly) charged up in the ranks to No. 4 from the No. 11 spot last year. Founded 140 years ago, Lilly spent US\$4.7 billion last year on R&D—nearly one-quarter of its sales revenue—and employs 9,000 R&D workers in six countries.

Similarly, the German giant Merck KGaA (Merck—not to be confused with the U.S. pharmaceutical firm Merck & Co.) climbed six spots to No. 11 this year.

Belén Garijo, chief executive officer of the Merck Healthcare sector and executive board member, says a major transformation has taken place at Merck over the last five years. The company has deep German roots, being founded nearly 350 years ago, but as Garijo explains, it has turned outward from its Eurocentric approach. It has grown through acquisitions that bring a diversity of cultures, such as the recent US\$17 billion acquisition of life science and technology giant Sigma-Aldrich.

After not being ranked in 2015, Novartis reemerged to claim the No. 19 slot with new scientific leadership at the helm—former Harvard oncologist James Bradner took over as president of the company's research arm, the Novartis Institutes for BioMedical Research (NIBR) in March 2016. The company, which employees say has always had a strong pipeline, has 137 pharmaceutical projects underway in areas such as oncology, cardiovascular disease, ophthalmology, and neuroscience.

Above all, creative, cutting-edge science with the potential to improve or save patient lives draws bright, ambitious researchers to these companies. "Ultimately, we want to be the one company to defeat the global burden of diabetes," says **Mads** *cont>*

Demographics



Gender

52% Male, 43% Female, 5% No response

Experience:

66% have 10 or more years work experience

Highest degree earned:

33% Doctorate, 33% Master's, 27% Bachelor's, 7% Other

Company type:

38% Pharma, 29% Biotech, 26% Biopharma, 3% University, 4% Other; More than 9 out of 10 work in private industry

Nature of work:

27% Development, 18% Applied Research, 15% Basic Research, 9% Administration/Executive, 10% QA/QC/Regulatory Affairs, 7% Production, 11% Other (respondents were able to choose more than one response)

Geography:

56% from North America, 28% from Europe, 12% from Asia/Pacific Rim, 4% from rest of world

Krogsgaard Thomsen, Novo Nordisk chief scientific officer and executive vice president.

Thomsen says the company is tackling risk factors for the disease by searching for novel targets that could prevent or slow the progression of type 2 diabetes. In addition, they are pursuing what he calls “holy grail scenarios” for diabetes, including a US\$2 billion investment in transforming injectable protein-based drugs into oral tablets, and also developing stem cell therapies that will regenerate or replace insulin-secreting beta cells in the pancreas.

Ingredients for a Top Employer

Every year, *Science* Careers surveys employees in the biotechnology, pharmaceutical, and biopharmaceutical industries to find out which companies are the top employers and to define the characteristics that make them so. In 2016, 5,984 respondents took the web-based survey deployed via email (see Survey Methodology online at <http://bit.ly/TopEmp2016>).

The bulk of respondents reported being 30 years of age or older (85%) and lived in North America or Europe (84%). Two-thirds of respondents have an advanced degree and 10 years or more of work experience, and 60% report working in R&D positions (see Survey Demographics box, above).

This year, as in the past, employees chose “innovative leader” as the top-driving characteristic of a top employer. Other company characteristics that drove the rankings were “treats employees with respect,” having “loyal employees,” having “work culture values aligned” with employees’ values, being “socially responsible,” and having a “clear vision” (see Driving Characteristics table, page 492).

The 2016 survey also asked respondents to define what makes companies the worst of the worst. Companies got low marks for ineffective leadership; having too much hierarchy, politics, or bureaucracy; and poor ethics that resulted in harm to patients or the environment. Respondents also dinged companies for profit-driven priorities and weak research-project pipelines.

When asked what makes the best companies the best, employees noted that the top firms operate as meritocracies, possess adequate resources, have trusted brands, and are responsive to stakeholders. Companies exhibiting these qualities include the rest of this year’s

top 10 employers: Vertex Pharmaceuticals (No. 5), Novozymes (No. 6), Genentech (No. 7), Alexion Pharmaceuticals (No. 8), Biocron (No. 9), and Roche (No. 10) (see chart on page 488 for full top 20 list).

Innovate big, go creative

For the last 14 years, companies that lead in innovative solutions to health care and biotechnology dominate the list of top employers. This year, the leading companies take innovation even further, seeking creative biological solutions that will take their therapies for cancer, diabetes, and Alzheimer’s disease truly outside of the box—or rather, the pill bottle. Not surprisingly, the companies that cultivate scientific creativity and encourage researchers to follow where their curiosity leads attract and retain the best scientific workforces.

Moderna’s scientists are motivated by the company’s mission to use mRNA science to deliver transformative medicines, including medicines that can replace missing or flawed intracellular proteins. Moderna’s mRNA therapeutics, made with proprietary nucleotide analogs, have the potential to generate any conceivable protein using the body’s own cellular machinery.

Kerry Benenato, associate director of chemistry at Moderna, was hooked by “the challenges we were going to face, knowing that what’s in the literature is not quite good enough, so we were going to have to do some pretty inventive discovery.” Her enthusiasm for the science she’s doing is catching—she’s recruited six friends and colleagues to work for Moderna in her two years there.

Regeneron believes that “innovation can be taught to the next generation,” says Yancopoulos. He notes that many of the company’s top technology innovators are “still in the conference room every day helping nurture the next great scientists.”

Yancopoulos cites Praluent, Regeneron’s new cholesterol-lowering drug, as an example of the next generation of drugs developed by leveraging the wealth of human genetics data. The Regeneron Genetics Center, which opened in 2014, already houses the sequences of more than 100,000 human exomes—the parts of the genome that encode proteins—linked to patient electronic medical records from the Geisinger Health System and other collaborators.

Last year, Novartis invested US\$8.9 billion in R&D, supporting more than 11,000 R&D employees worldwide. Ann Taylor, global head of the program office for NIBR, says the company has cultivated a culture that listens to everyone and looks to multiple sources for the next great idea—from external collaborators to postdocs.

As a group leader at the NIBR Biologics Center in Basel, Switzerland, Darko Skegro engineers bispecific antibodies to target cancer and modifies antibodies to overcome cancer resistance. “Normally antibodies against cancer recruit natural killer cells, but can we switch up the antibody in a way that it suddenly recruits other cell types to come and kill the cancer cells?” he asks. When his group shared this risky idea with colleagues in Basel and Cambridge, they were immediately given the green light to try it. “This is why Novartis is a great place to work—I have the freedom to explore things and innovate—and with the support of many other groups.”

Alliances strengthen innovation

Whether it’s through mergers and acquisitions, partnerships, or academic collaborations, top employers find strategic ways to make alliances work to their portfolio’s advantage. Both Regeneron and Moderna represent relatively small but lightning-fast companies whose platform technologies have matured into clinical programs advancing at a rapid clip. A key to both companies’ success has been identifying the appropriate partners for drug development projects.

This summer, Moderna announced two major deals with pharmaceutical partners to advance projects in oncology and cystic fibrosis. A US\$200 million deal with U.S.-based Merck & Co. would pair Merck & Co.’s immuno-oncology **cont>**

Driving characteristics of top employers

2016	2015
1. Innovative leader in the industry	1. Innovative leader in the industry
2. Treats employees with respect	2. Treats employees with respect
3. Loyal employees	3. Loyal employees
4. Work culture values aligned	4. Socially responsible
5. Socially responsible	5. Work culture values aligned
6. Clear vision	



Driving characteristics are listed in descending order of impact on overall employer rankings.

The colored backgrounds indicate the characteristics in common for the two years.

drug Keytruda with mRNA-based personalized cancer vaccines made by Moderna. Moderna has also paired with Vertex Pharmaceuticals (ranked No. 5 in this year's list), to discover and develop mRNA therapies for cystic fibrosis patients who have a dysfunctional cystic fibrosis transmembrane conductance regulator (CFTR) protein or are missing it altogether.

Both of these collaborations combine the deep disease expertise and experience of a partner with Moderna's core technology to try to develop breakthrough treatments, says **Stephen Hoge**, president of Moderna. "We know our technology. But we also understand that we need help from others who know the most about a given disease. So we look to partner wherever we believe it can improve our chance of getting medicines to patients."

Moderna's leaders like to point out that although the company feels cozy and young like a startup, it has the resources of a much larger operation. As of September, Moderna had US\$1.4 billion in cash assets on hand—due in no small part to these alliances—to invest in its large and diverse pipeline for drug development. "We don't have to limit ourselves. The financial backing we have enables us to move fast and do the right experiments," says Benenato. "That's unique about Moderna."

Likewise, Yancopoulos calls Regeneron's alliance with Geisinger Health Systems "a perfect marriage." Regeneron gains access to high-quality medical records and patient DNA, and in return, Geisinger gets detailed genetic information that helps them improve and anticipate health care for patients.

Stretching keeps careers limber

Overall, job satisfaction is high among R&D industry workers. Only one-fifth of survey respondents said they were likely to search for a new position in the next year. But more than half of those (54%) gave "career advancement," "professional growth," or "seeking new experiences" as the reason behind their potential move. Top employer firms keep employees engaged and challenged by catering to researchers' restless minds.

"All scientists love learning new things, and people learn in different ways," notes **Adam Kievman**, head of talent management for Moderna. And so Moderna University, the company's professional development program, increases its offerings by the day. This fall, employees can choose between a 30-hour clinical lecture series on genome evolution, workshops on building a professional brand, and talks on leading group members through change.

Lilly caters to scientists who want to climb the career ladder without becoming the dreaded "M" word—management. The technical ladder track allows researchers to take on more leadership within the company and be promoted for their technical expertise.

Distinguished research fellow **Henry Bryant**, an immunologist, has hit the pinnacle of the technical ladder at Lilly, with a position

equivalent to a senior vice president. He can influence company direction and strategy, he says, but still spends most of his time "dreaming up experiments to unravel a key question, seeing the results, and redesigning."

He also says that Lilly's breadth allows employees to make lateral or geographic moves that advance their professional growth. Employees can do work exchanges for six months to two years at another R&D site such as New York, San Diego, Shanghai, the United Kingdom, or Spain. "Working on diabetes in China, employees get to see that it's a very different disease there than it is in the United States," Bryant says.

Merck employees have opportunities to work across the company's three business sectors, Healthcare, Life Science, and the company's Performance Materials, says **Kai Beckmann**, chief administration officer. For example, the materials and health care teams are collaborating on the LicriEye project, which aims to develop a cataract treatment using a liquid crystal-based lens.

Merck's globalization means that the company puts a high priority on diversity and inclusiveness among its employees, who are drawn from 122 different nationalities. Merck sees gender, age, and cultural diversity as a source of competitive advantage that brings the right set of people to the conference table to meet challenges, says **Garijo**. Women make up 41% of the Merck workforce and hold 27% of the company's upper management positions.

"Our talent pool has grown to match the dynamics of our business," says **Garijo**. Keeping that talent pool engaged and productive while preventing burnout and stress are key to retaining the best scientists. "We are not only a family-owned company, but a family-oriented company. Work-life balance is one of our top priorities and one of the most important factors bringing people to Merck today."

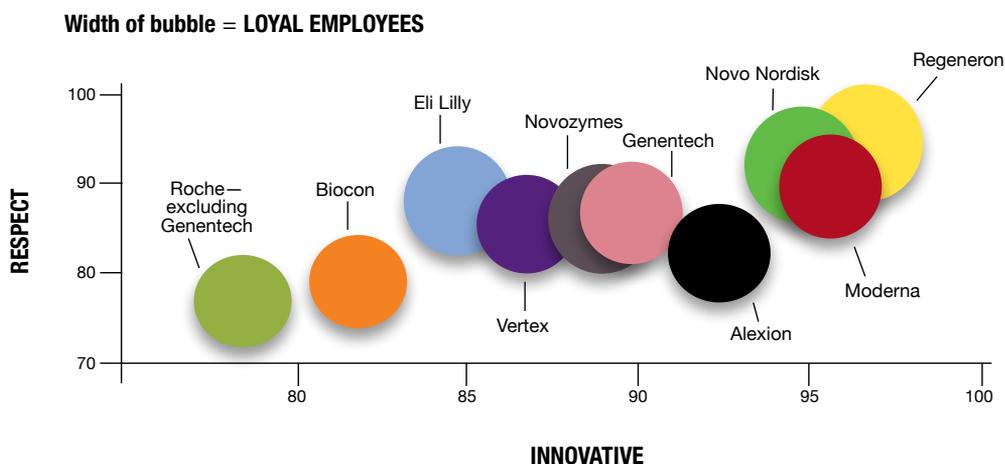
Promoting better balance

The fact that a growing portion of the industry's workforce comes from the Millennial generation means that many employees grew up with a smartphone in their hands and are used to maintaining a constant connection to their work colleagues, family, and friends. That connectivity can be both a boon to productivity and a fast track to burnout. Top employers have figured out how to help their researchers integrate their work and home lives so that projects proceed and time off is protected and restful.

At Regeneron and Novo Nordisk, leaders recognize that fast-paced work carries a higher risk for employee exhaustion, so they encourage taking personal time and working from home when possible. They also carve out a hard boundary around weekends and vacation time.

Two years ago, Novartis introduced some forced downtime into its yearly calendar, reserving two weeks in the middle of

Comparison of top ten's top characteristics



Comparison of the top 10 companies on the basis of the top three drivers (scored out of 100):

- **Innovative leader in the industry** (x-axis),
- **Treats employees with respect** (y-axis),
- **Has loyal employees** (bubble width).

summer for a company-wide break from formal meetings. This “Rejuvenation Period” gives employees a window to pursue a backburner project, dive into a literature search, or simply catch up with colleagues over lunch. Skegro used his time this summer to “dig into intellectual property, look at what our competition is doing, and see what we can do to be a strong competitor.”

Lilly, like many top employers, offers traditional work-life balance options for flexible scheduling, part-time weeks, job shares, and on-site daycare to support working parents. But, says **Terri Grant**, vice president of human resources for global R&D, it’s the on-campus amenities that employees take advantage of the most for relieving stress. Indianapolis employees jog on the track, play a pickup soccer game, or grab a beer on the REVelI pub’s patio; and San Diego employees have space to store their surfboards. “When you’re really chewing on a problem, there’s nothing better than to be able to go out and run for 15 minutes,” to literally jog an idea to the surface, says Lilly research scientist **Jennifer Howell**.

Other ways employers help workers stay balanced include providing backup caregiving for sick children or aging relatives (Novartis), weekly deliveries of fresh fruit (Novo Nordisk), and on-site counseling when employees feel overwhelmed by life’s pressures (Merck). With its headquarters in Denmark, Novo Nordisk has some work-life balance supported by national policy: The company offers yearlong, fully paid maternity leave for new mothers (or split with new fathers) and a 37-hour workweek. When senior scientist **Shan Ren** took her maternity leave for her second child, she naturally worried that she might lose her place on her team as her project moved ahead. Instead, she says, her group helped her transition and briefed her on new aspects that had developed. “Looking back, I didn’t feel like I lost anything. It was a year of joy” to be at home with a new baby, she says.

It’s the little things

Respecting employees’ time, supporting working parents, and encouraging healthy, active lifestyles are par for the course for top employers. It’s a recipe shown to attract loyal employees who want to work for socially responsible companies. But it’s also the little things that companies provide as perks or fun benefits that keep employees happy and motivate them to recruit their colleagues.

Both Novartis and Lilly have employee networking groups that bring together people with common interests, goals, or backgrounds. Distinguished research fellow **Jirong Lu** is part of the 700-member Chinese Culture Network at Lilly: “It is one of the things that makes you feel like Lilly is a family.”

There’s also a family feel to the ice cream truck that pulls up in Cambridge each Tuesday in the summer to treat Novartis employees. Moderna’s catered daily lunches with selections like aloo mutter, Brazilian chorizo, and quinoa beet salad keep workers breaking bread together and trading ideas. And lucky Regeneron raffle winners can enjoy prime seats at a New York Yankees or Mets baseball game with their kids.

All top employers offer ways to give back to the community, whether it’s building a community lab space for local middle- and high-school students (Novartis) or sending employees on two-week global service projects (Lilly). Lu is typical of survey respondents who seek companies with values that reflect their own: “Integrity, respect for people, and excellence—I’m really proud to work for a company that shares those values.”

For researchers, of course, the most important “bonus” their jobs provide is feeling that their science is making a real difference.

At Novo Nordisk, senior scientist Ren works on the company’s oral formulation project in Måløv, Denmark. She was attracted by the groundbreaking challenge of putting large peptides or proteins stably into a tablet form that could be safely absorbed—but not degraded—by the gut. Either GLP-1 (glucagon-like peptide-1)—which stimulates insulin secretion—or insulin in tablet form would revolutionize treatment for patients who need multiple injections per day, she says.

Ren admits that many people are skeptical about whether peptide drugs can be made into tablets. Her team not only believes it will work, but that they will be the ones to deliver the first successful formulation. “We are systematically and seriously working on this concept,” she says, and people frequently ask her when the first tablets might be approved. “To know that I am doing something that will bring a big change to so many patients makes me feel really proud.”

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