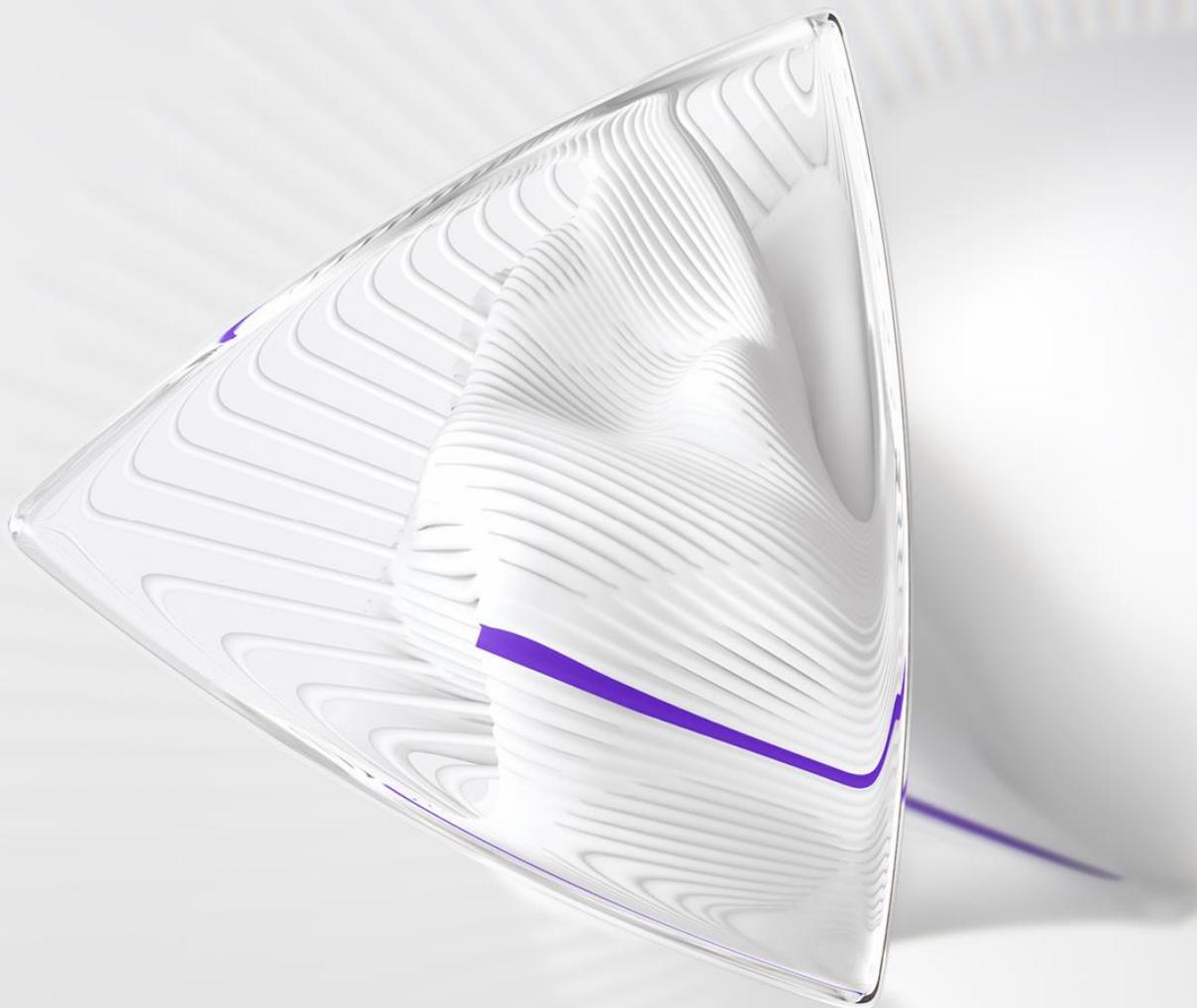




Accelerating drug development through collaboration

Insights into academic-pharma partnerships



Contents

Introduction	2
Patenting hotspots	3
Number of patent applications	3
Number of patent applications filed under the PCT	4
National versus international patents in Mainland China	6
Global partnering activity	8
Research institute deals by country	8
Top academic and government institution deal makers	9
Top industry partners	10
Trends in therapeutic areas	11
Comparison of therapeutic area focus	12
Trends in the agreement type	13
Deals by drug development phase	14
Align research to industry needs	16
References	17

Introduction

Research institutions have long sought partnerships with the pharmaceutical industry to advance their research and secure new funding streams. Many institutions do not have the resources to move their research from bench to bedside, and partnerships provide the financial and human resource means as well as the experience in bringing a product to market.

In fact, licensing out to drug companies can yield high income for some academic institutions, as evidenced by the figures below. At the same time, pharmaceutical companies recognize the value of academic and research organizations in acting as a source of innovation, drug discovery and improved productivity. As such, many collaborations have evolved to include a broader scope, aiming to translate basic science into potential products or to identify and evaluate targets.



Figure 1. Top university and pharma deals.

Source: Cortellis Deals Intelligence

Understanding the historical landscape of research institution and pharma partnerships can help you make decisions about the best financial and structural deals for your institution. In this report, we use data from **Cortellis Competitive Intelligence™** and **Cortellis Deals Intelligence™** to provide insights on:

- patenting hotspots in the academic drug research landscape,
- partnering activity in institutions worldwide,
- influences that might be driving any differences in partnering activity,
- the clinical phase timing of deal making between research institutions and pharmaceutical companies and
- best practice approaches for aligning academic research with pharmaceutical industry needs to achieve the maximum impact.

Patenting hotspots

Measuring innovation in the life sciences industry can be complex, given that discovery and research occurs along a continuum that can be challenging to capture in one measure. However, because patents are a publicly available source of timely information on innovative activities, they can be used as an output measure of innovation for institutions, countries and regions. Therefore, we use patent applications as an indicator of research output in the next section.

Number of patent applications

First, it may be helpful to assess the patenting hotspots in the research institute drug research landscape. The number of patent applications submitted by an institution is often seen as an indicator of its innovation activity and encouragement of academic discovery and invention. We used data from January 2015 to July 2020 to highlight the trends in the number of pharmaceutical patent applications from academic and government institutions globally across the last five years and part of 2020.

Table 1 shows the top three research institute patent applicants, ranked by total number of pharmaceutical patent applications (deduplicated by INPADOC patent family), not granted patents, across the time period. In Cortellis Competitive Intelligence, pharmaceutical patents are classified as those for drug treatments, vaccines, drug delivery devices and related processes, and technologies.

Interestingly, all three are in Mainland China. The top ranked institution, Zhejiang University, focuses on innovation, and its Industrial Technology Research Institute (ITRI) oversees corporate partnerships and technology transfer activities for the university.

Rank	Institution	Country/region	Number of patents*
1	Zhejiang University	Mainland China	4,722
2	Jiangnan University	Mainland China	4,002
3	Sichuan University	Mainland China	3,251

Table 1. Top three academic and government institution pharmaceutical patent applicants

Source: Cortellis Competitive Intelligence

*deduplicated by INPADOC patent family

Of the top 20 institutions, 19 are in Mainland China; the exception is the University of California, which ranked seventeenth (Figure 2).

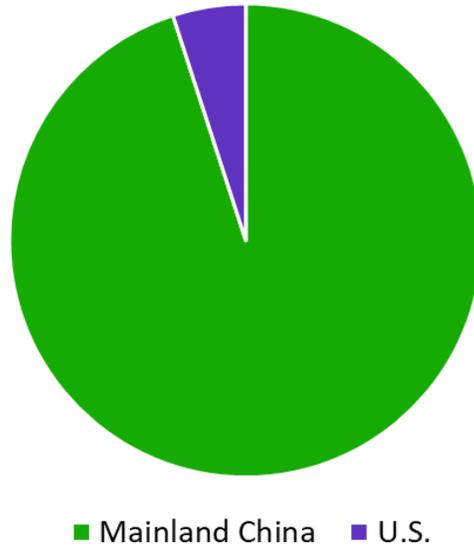


Figure 2. Location of the top 20 academic and government institution pharmaceutical patent applicants
Source: Cortellis Competitive Intelligence

Number of patent applications filed under the PCT

An alternative metric to patents is the number of applications filed under the Patent Cooperation Treaty (PCT), which is a fast-track administrative route to multi-jurisdiction patent coverage. When ranked by the number of PCT applications, our analysis found that the University of California ranked first, followed by two French institutions (Table 2): INSERM, a French government agency with a focus on health and medical research, and the National Centre for Scientific Research (CNRS), the largest fundamental research agency in Europe with 10 institutes covering a broad range of sciences, from astrophysics to zoology.

Rank	Institution	Country	Number of patents*
1	University of California	U.S.	1,419
2	INSERM	France	1,293
3	National Centre for Scientific Research (CNRS)	France	1,095

Table 2. Top three academic and government institution pharmaceutical PCT applicants
Source: Cortellis Competitive Intelligence
*deduplicated by INPADOC patent family

Patents are a useful measure of innovation in part because this information is publicly accessible, giving a clear and parallel view of organizations’ innovation activity. For example, the University of California provides a detailed breakdown of its patenting and licensing activities on its website,¹ including financial data and commercialization reports. INSERM also actively highlights its patenting activity on its website and in press releases, highlighting that its “portfolio of more than 1,650 patents” makes “it...the top-ranking European academic institute in terms of the number of patents filed in biomedical research and in the pharmaceutical sector.”

INSERM has a 100% private subsidiary, Inserm Transfert (IT),² that assists INSERM research units in the promotion of their work: project sourcing, intellectual property, maturation, the search for and management of European funding and technology and knowledge transfer, collaboration with a

licensing option, licensing or even the creation of a biotechnology firm (start-up). Annual CNRS activity reports can be found on the CNRS website.³ CNRS Innovation,⁴ a limited company subsidiary of CNRS and BPI France, was established to transfer innovative technologies from CNRS-linked laboratories to industry: technology assessment, establishment of protection strategies, managing the patent portfolio and negotiating and monitoring operating contracts.

Looking more broadly at the locations of the top 20 institutions for PCT applications, the United States is predominant, with 13 of the 20 institutions (Figure 3).

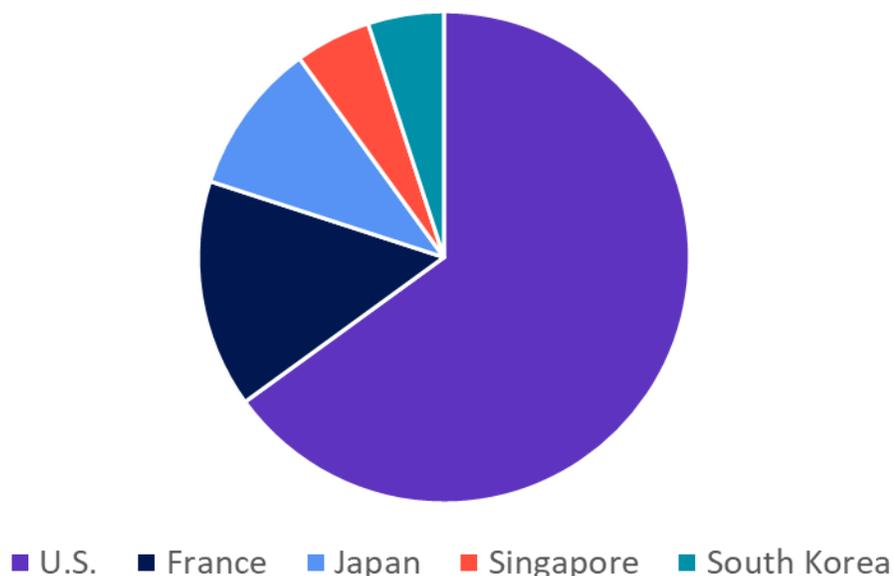


Figure 3. Location of the top 20 academic and government institution pharmaceutical PCT applicants
Source: Cortellis Competitive Intelligence

Next, we segmented the overall number of global PCT applications by region and identified the top three institutions for PCT applications in each region: the Americas; Europe, the Middle East and Africa (EMEA); and Asia Pacific (APAC).

In the Americas, we had already identified that the top ranking was held by the University of California (Table 3). Harvard University, ranking second, facilitates IP protection and innovation transfer through its Office of Technology Development⁵ and actively highlights its granted patents in monthly press releases.⁶ The National Institute of Health is the agency within the third-ranked U.S. Department of Health and Human Sciences that is responsible for health and biomedical research.

Rank	Institution	Country	Number of patents*
1	University of California	U.S.	1,419
2	Harvard University	U.S.	633
3	U.S. Department of Health and Human Services	U.S.	565

Table 3. Top three academic and government institution pharmaceutical PCT applicants in the Americas
Source: Cortellis Competitive Intelligence
*deduplicated by INPADOC patent family

Incidentally, the highest ranked institution in the Americas outside of the United States is Canada's University of British Columbia, which is ranked at 119th.

In EMEA, all top three PCT filers are long-standing French public institutions (Table 4). As part of the top three overall, INSERM and CNRS appear again. Because these institutions also jointly manage several research units, they also share some of the patents listed. At the Public Assistance - Hospitals of Paris (AP-HP), the activity of ten clinical investigation centers is coordinated and protected by the Clinical Research and Innovation Department (DRCI).⁷

Rank	Institution	Country	Number of patents*
2	INSERM	France	1,293
3	National Centre for Scientific Research (CNRS)	France	1,095
17	Public Assistance - Hospitals of Paris (AP-HP)	France	325

Table 4. Top three academic and government institution pharmaceutical PCT applicants in EMEA

Source: Cortellis Competitive Intelligence

*deduplicated by INPADOC patent family

Similar to the other regions, the top ranked institutions in APAC are those that make it their mission to protect innovative research, by having dedicated departments or institutions that are dedicated to overseeing and patenting the institutions' innovations (Table 5). For example, the SNU R&DB Foundation⁸ is part of the Seoul National University in South Korea and houses an Intellectual Property Management Department as well as an industrial-academic cooperation/technology holding company. In Singapore, the Agency for Science Technology & Research (A*STAR) is a government agency established to bridge the gap between academia and industry in research and development and currently includes 12 biomedical research entities.⁹

Rank	Institution	Country/region	Number of patents*
16	SNU R&DB Foundation	South Korea	332
18	Agency for Science Technology & Research	Singapore	319
19	Osaka University	Japan	315

Table 5. Top three academic and government institution pharmaceutical PCT applicants in APAC

Source: Cortellis Competitive Intelligence

*deduplicated by INPADOC patent family

National versus international patents in Mainland China

Despite the high national patenting volumes in Mainland China shown in Table 1, there are no Mainland Chinese academic institutions in the top 20 PCT filers overall (Table 3) or even the top three PCT filers in APAC (Table 5). The highest ranked Chinese academic institution overall is the Shanghai Institute of Materia Medica at number 37. This might indicate that Mainland Chinese institutions are filing primarily at home or submitting directly in other countries but not submitting using the PCT route.

The Chinese government wishes to encourage more innovation and has developed a relatively simple evaluation matrix to assess innovation. A patent application is deemed a major index of the innovation outcome evaluation, which has led to a recent, dramatic increase in the number of national patent applications, particularly compared globally, in Mainland China. Therefore, there

might not necessarily be an advantage to filing internationally, such as through a PCT, when a national filing is sufficient for the innovation evaluation.

An additional reason for primarily national filings is that some organizations might not need to commercialize their products beyond the Mainland Chinese domestic market because it is simply large enough to meet their needs. This is supported by data in the 2020 Pharmaceutical R&D Factbook published by the **Centre for Medicines Research (CMR) International**. These data highlighted the growth of innovative first-in-world drug launches in Mainland China in 2019. These products were from companies, in most cases, with no global ambitions or from collaborations that were specifically designed to serve the Chinese market.

This recent growth in innovative drugs in Mainland China is noteworthy because, historically, the Chinese pharmaceutical industry has focused on generics rather than on innovative medicines. The shift might be partly due to recent reforms by the Chinese government that aim to stimulate innovation as part of a long-term investment to improve healthcare in the nation.

In the 13th Five-Year Plan on National Technological Innovation issued in 2016, for example, the National Plan for Medium and Long-Term Technological Development set the goal of developing China as an innovative country by 2020, and the Outline of the National Strategy of Innovation-Driven Development defined the phased goals to reach by 2050. In addition, the focus of Mainland China's scientific research has shifted from having the greatest number of patents or publications to enhancing the quality and international influence of their research.

The Chinese patent authority, the China National Intellectual Property Administration (CNIPA), has also begun to make the IP process more robust. For example, the new "Foreign Investment Law" announced in 2019, among many changes introduced greater protection of foreign IP rights. Some see it as a step closer to a law-based environment that is closer to international practices; the updates include standardized administrative actions and assurance that illegal behavior by officials is prosecuted appropriately.

Therefore, with these recent government reforms and evolving IP regime, we might see a shift in patenting trends in Mainland China in the future, particularly toward more PCT filings.

Global partnering activity

As discussed, the act of protecting academic IP through a patent might not necessarily mean that the IP is transferred or commercialized; therefore, it is also interesting to determine the downstream effects of patenting in terms of deal making between research institutions and the pharmaceutical industry.

When considering the types of partnerships that have been made over the last five years, only an average of 8% have involved pharma acquiring a license to use a university patent. Similarly, only 13% of deals involve development and commercialization licensing deals where a pharmaceutical company acquires a license from a research institution to develop and market a drug. Early R&D partnerships, where research institutions and a pharmaceutical company jointly share expertise and resources to develop drug candidates, are much more prevalent, at an average of 44% (3,107 deals). This is despite the emphasis on technology and patent deals by research institutions.

Research institute deals by country

United States institutions lead the way in partnerships with the pharmaceutical industry (Figure 3). In fact, the total number of deals involving U.S.-based academic and government institutions is greater than for the rest of the top 10 countries/regions put together.

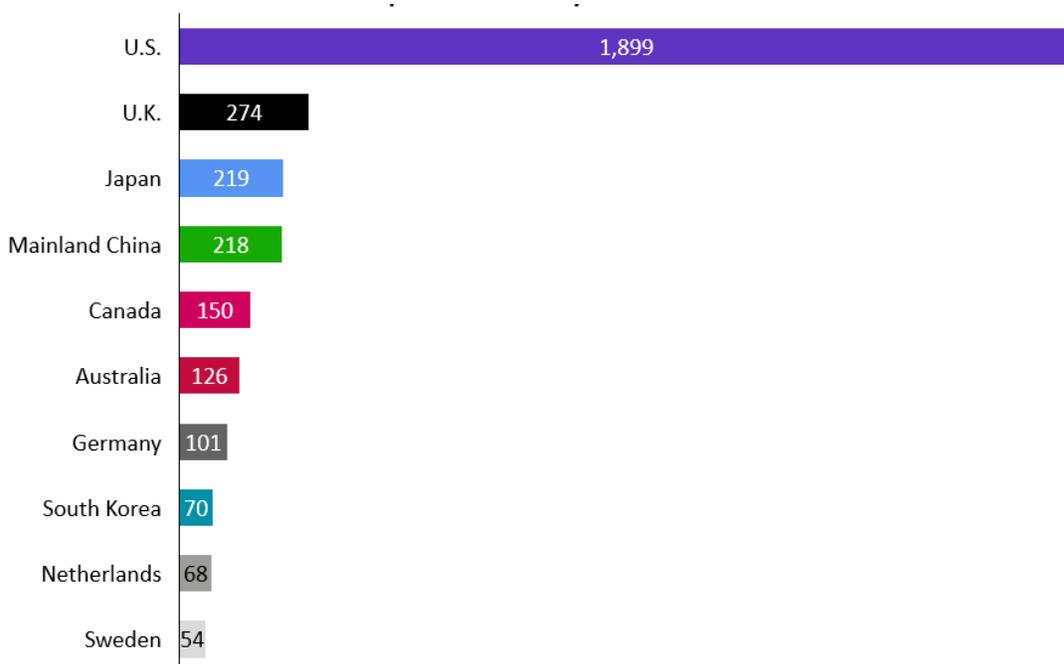


Figure 4. Top 10 countries by number of deals between academic/government institutions and pharmaceutical companies

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 involving academic, government, non-profit research institutes, hospitals and charities

For countries/regions other than the United States, the data show that patenting activity is not necessarily a predictor of partnerships. For example, at number 11, France falls outside the top 10 countries by number of deals despite its status in the number of PCT applications, with two of the top three institutions globally and all of the top three in EMEA.

Top academic and government institution deal makers

When we look at the top 20 institutions by number of deals, the top three are all based in the United States (Table 6). Similar to the institutions ranking high for patent filings, the top ranked MD Anderson Cancer Center also has an Office of Technology Commercialization¹⁰ that aims to accelerate the commercialization of new drugs, diagnostics, devices and therapies within its research portfolio. Announcements in September and October of 2020 include:

- Five-year collaboration for the preclinical and clinical investigation of AlloCAR T candidates across Allogene Therapeutics, Inc’s broad portfolio of hematologic and solid tumors¹¹
- Three-year collaboration with Taiho Pharmaceutical Co., Ltd. to develop treatments for unmet oncology needs, including brain metastases and cancers refractory to available therapies¹²
- Collaborative agreement combining MD Anderson’s clinical trials infrastructure and expertise with the clinical pipeline products for patients with certain types of leukemia from Astex Pharmaceuticals, Inc., a wholly owned subsidiary of Otsuka Pharmaceutical Co. Ltd¹³

Rank	Institution	Country	Number of deals
1	MD Anderson Cancer Center	U.S.	105
2	University of Pennsylvania	U.S.	56
3	National Institute of Allergy and Infectious Diseases	U.S.	54

Table 6. Top three academic and government institution deal makers

Source: Cortellis Deals Intelligence

Only two of the top 20 are non-U.S. institutions (Table 7). These are the University of Oxford in the United Kingdom and University of British Columbia in Canada which, as mentioned earlier, was ranked number 119 in PCT filings. Perhaps the most notable recent deals for the University of Oxford are targeted at COVID-19. The most recent is the RECOVERY (Randomised Evaluation of COVID-19 thERapY) trial,¹⁴ one of the world’s largest RCTs of potential COVID-19 treatments, which will evaluate the antiviral antibody product, REGN-COV2, from Regeneron Pharmaceuticals, Inc. In April, the agreement with AstraZeneca¹⁵ was announced, in which AstraZeneca will be responsible for the global development, manufacturing and distribution of the vaccine being developed by the University of Oxford (ChAdOx1 nCoV-19).

Rank	Institution	Country	Number of deals
7	University of Oxford	U.K.	33
12	University of British Columbia	Canada	27
22	Shanghai Institute of Materia Medica of the Chinese Academy of Sciences	Mainland China	24

Table 7. Top three non-U.S. academic and government institution deal makers

Source: Cortellis Deals Intelligence

Top industry partners

Regarding the industry players that have made the most partnerships with academia since 2015, the top five are companies considered to be “Big Pharma” companies (Figure 5). These companies traditionally relied on blockbuster drugs for their revenue; however, approximately five to six years ago, a number of the blockbuster drugs were going off patent, known as the “patent cliff.” In addition, there appeared to be a decline in productivity in terms of launching new drugs, so the pharmaceutical industry sought new ways to boost their early drug pipelines. At the same time, academic institutions were subject to funding cuts and were seeking new financing streams.

Dr. Seeto, VP and head of partnering and strategy at MedImmune, a subsidiary of AstraZeneca, said at the time “Recently, there has been a shift in pharma thinking and shift in academic thinking, which has led to this unheralded period where companies want to collaborate more significantly with academia.”¹⁶

AstraZeneca has been the most active industry partner over the last five years, primarily with U.K.-based research institutions such as the deal with the University of Oxford for the COVID-19 vaccine. This might explain the number two ranking of the United Kingdom in terms of academic-industry deals. As seen in Figure 5, other companies such as Johnson & Johnson and GlaxoSmithKline (GSK) have also incorporated academic partnering and open innovation within their strategic plans.

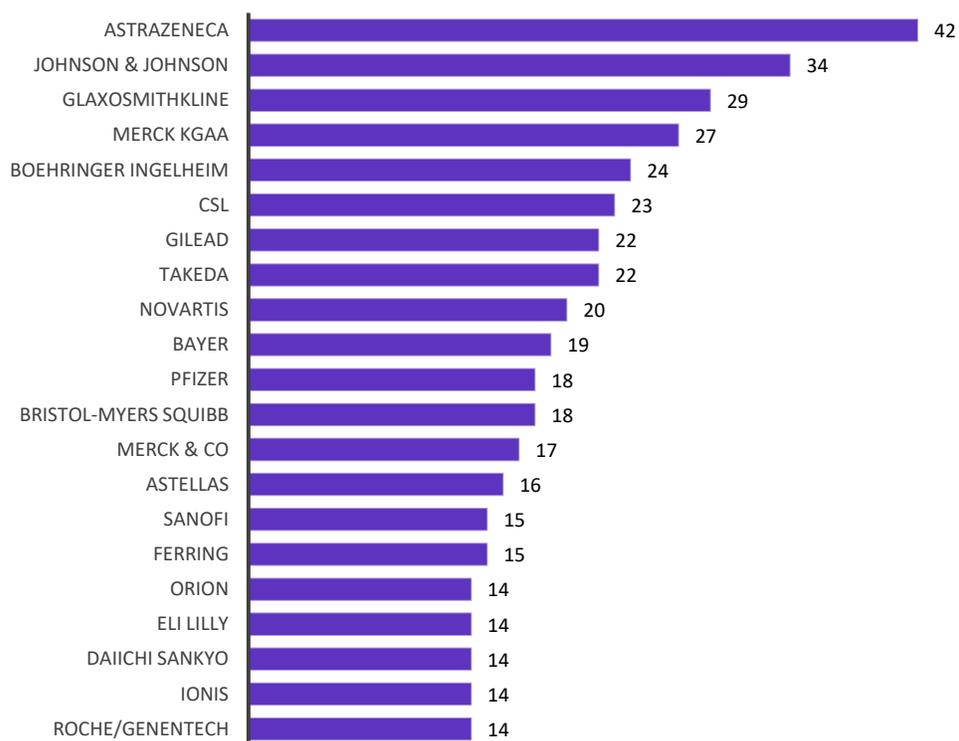


Figure 5. Top 20 industry partners by number of academic and government institution deals

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 involving academic, government, non-profit research institutes, hospitals and charities. Subsidiaries are included with their parent companies in the counts.

As a potential outlier at number six, CSL warrants a brief mention because it is not a top 20 pharma company. Deeper analysis of the data showed that most of its deals with academia have been to provide funding for drug research on their behalf.

As more academic and government institutions are looking to commercialize their research and more pharma companies are proactively looking for research programs and partners, it becomes important for research institutions to differentiate their assets. To do this, an understanding of the research landscape within commercial organizations is essential for partnering decisions.

Trends in therapeutic areas

To determine what might be attractive to industry partners, we analyzed deals by therapy area to determine whether deals involving research institutions are focused in areas where the pharma industry has a strong need for innovation to help build their pipelines. In other words, is there a good match?

While cancer has remained the area with the largest number of research institution-industry partnerships, deal volumes have declined over the last five years (Figure 6). The deal numbers for infectious diseases and neurology/psychiatric disorders have been similar over this period — until 2020. Driven by the extraordinary global research effort to find vaccines and treatments for COVID-19, the industry has looked to academia for breakthroughs, causing the spike for infectious diseases in 2020.

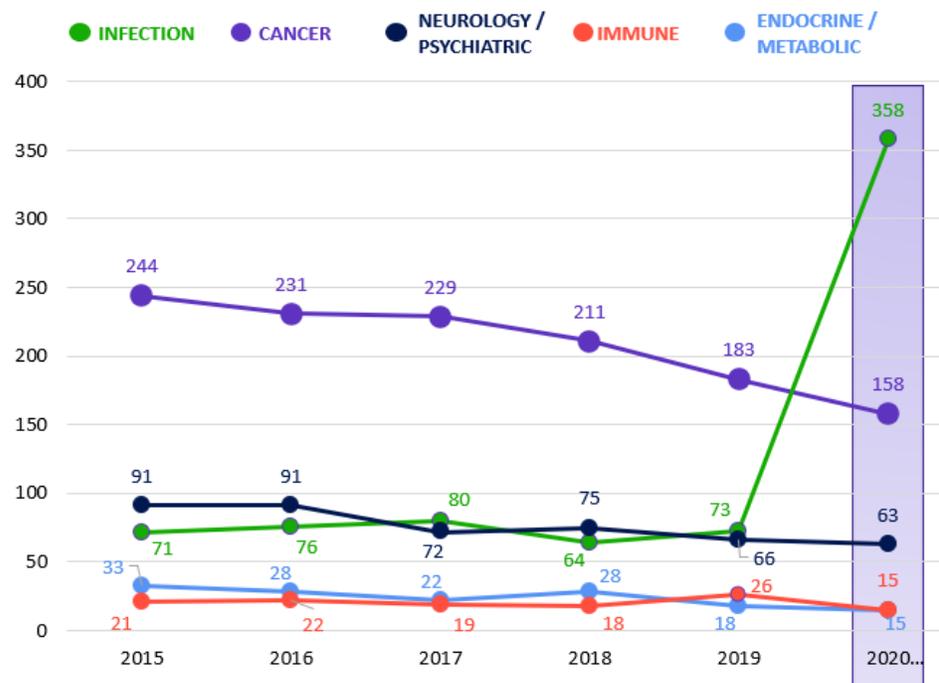


Figure 6. Number of research institution and industry deals for the top five therapeutic areas

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 involving academic, government, non-profit research institutes, hospitals and charities

Comparison of therapeutic area focus

Next, we compared the relative proportion of research institution deals with all deals in a specific therapy area (Figure 7). For this analysis, the comparison was all industry deals since 2015, including those between commercial organizations and those involving non-commercial organizations. Then, each deal was assigned to a single therapy area, or if the deal was related to more than one asset or therapy area, it was classified as “diversified.” The “other/miscellaneous” classification includes technologies, software, digital health assets, etc. In a specific therapy area, if the proportion was the same for research institution deals as for all deals in general (e.g., 20% in both), this is shown on the chart by an even split (50:50), indicated by the red line.

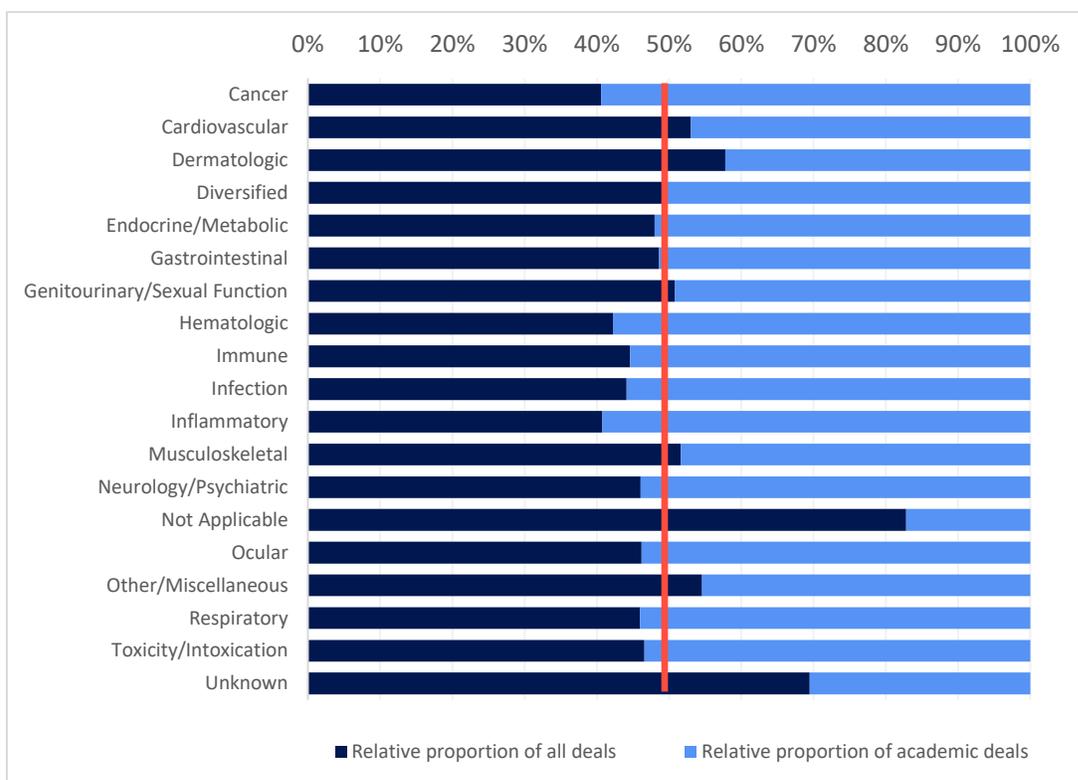


Figure 7. Relative proportion of research institution deals to all deals in a therapy area

Source: Cortellis Deals Intelligence

Based on the results, research institution deals are over-represented in cancer, hematology, inflammatory diseases, infectious diseases and immunological diseases. For example, cancer-related deals represented 22% of all deals and 33% of all research institution deals, which is shown as a 40:60 split. At the other end of the spectrum, research institutions are under-represented in partnerships for dermatology, other/miscellaneous and cardiovascular diseases. Deals with “unknown” therapy area are also less common in academia, which might indicate a tendency to disclose more information than commercial organizations.

Trends in the agreement type

As stated previously, an average 44% of research institution-industry deals are early R&D deals where the organizations jointly share expertise and resources to develop drug candidates. This type of agreement has been increasing over the last five years and is projected to make up half of all research institution-pharma industry deals in 2020 (Figure 8). Technology deals are also increasing. These trends fit with the model of collaborative, risk-sharing relationships that help drug companies lower their costs and accelerate development.

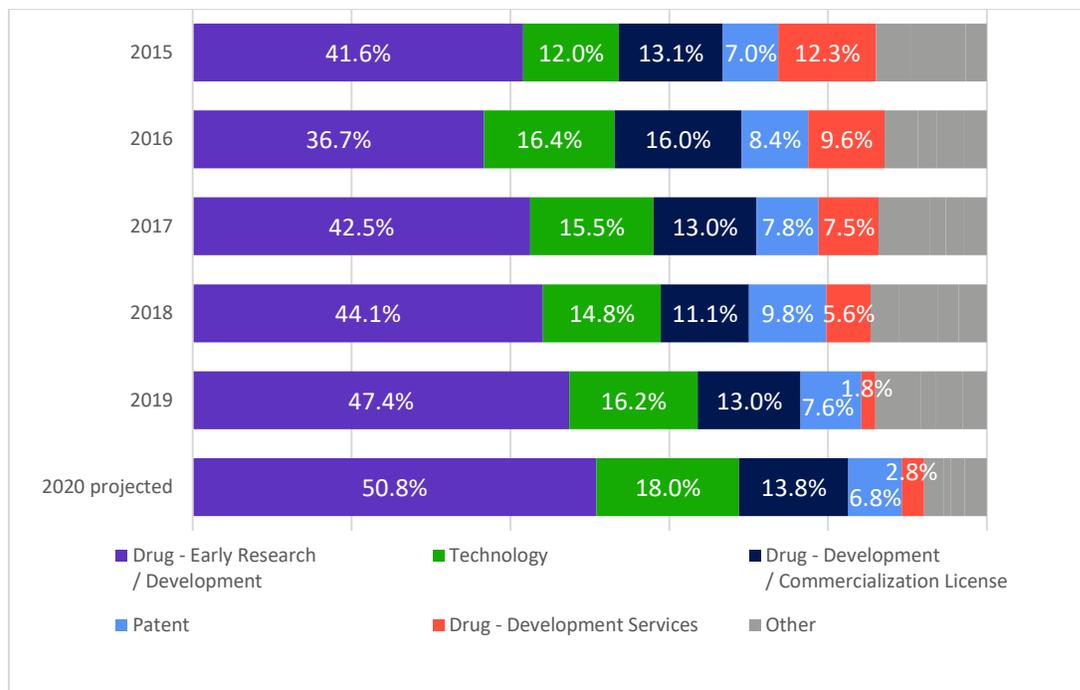


Figure 8. Trends in agreement type

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 involving academic, government, non-profit research institutes, hospitals and charities

Drug development services agreements have declined significantly over the last five years. This might be indicative of a shift away from a fee-for-service model. A similar trend was observed with biotechnology companies that began providing services such as target discovery using proprietary platforms but shifted toward their own development after securing sufficient funding.

Deals by drug development phase

To gain additional insights about partnership trends, we narrowed the focus to deals related to drug assets only. When considered all such deals, slightly more than half are for drugs in the discovery or preclinical phases (Figure 9).

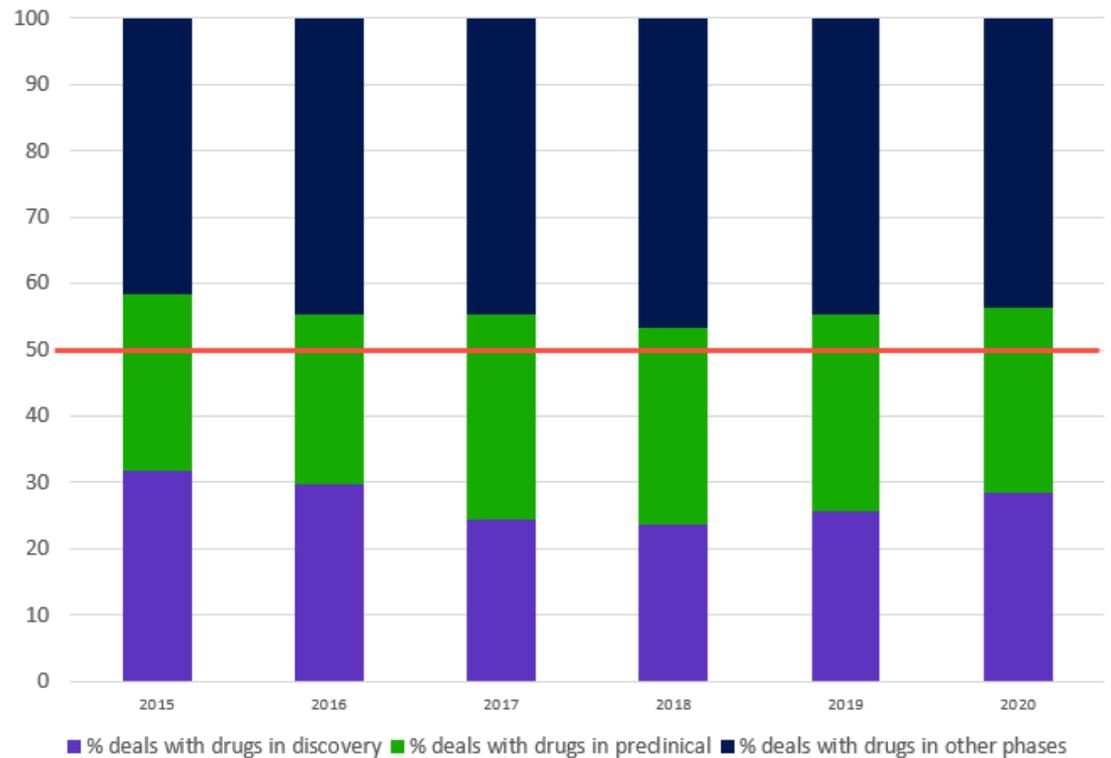


Figure 9. All deals by drug development phase

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 related to drugs

However, these early deals represent approximately two-thirds of deals between research institutions and industry (Figure 10). This also aligns with the model where academic research is helping to fuel the pipelines of pharmaceutical companies. Within the early phase deals, the proportion of preclinical assets has increased over the last five years while the proportion in discovery phase has decreased. This could indicate the need for industry partners to have more preclinical data from academic partners before committing to a deal. In 2020, the resurgence in discovery phase partnerships is most likely driven by the strong push to find vaccines and treatments for COVID-19.

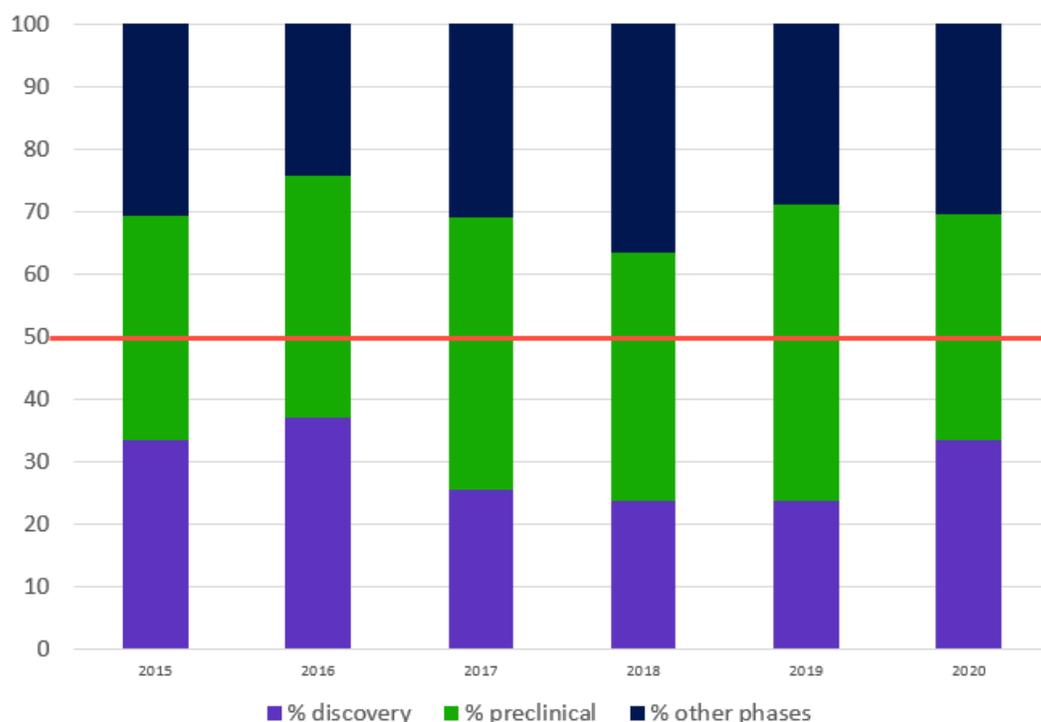


Figure 10. Deals between research institutions and industry by drug development phase

Source: Cortellis Deals Intelligence

All deal records added to Cortellis from Jan 1, 2015 to Jul 30, 2020 related to drugs and involving academic, government, non-profit research institutes, hospitals and charities

Because these are also the riskiest phases of drug development, to attract an industry partner, the institution needs to build a compelling case for both the scientific rationale and commercial potential of the asset. Interest in therapies for areas with unmet needs, such as rare diseases, is increasing as the days of big blockbuster drugs become a thing of the past and companies shift toward more niche areas with less competition and therefore greater opportunity. Furthermore, government incentives and regulatory support for research in these areas can result in lower development costs and expedited review.

Align research to industry needs

The analyses show that industry partners value the innovative contributions of academic research institutions to drug discovery, while research institutions benefit from collaborations to bring their discoveries to market. For maximum impact, there are a few best practices that research institutions can follow to align their research with the needs of the pharmaceutical industry.

- Perform thorough due diligence.
- Use data such as those presented in this report, in addition to annual reports from commercial and non-commercial entities, to benchmark your research and partnering efforts against those of other institutions.
- Understand how to differentiate your institution in terms of research strengths and therapeutic areas.
- Evaluate the deals that are occurring, and with whom, to understand the best-fit deal type and structure (royalties, upfront payments, contingent milestones, etc) for your institution.

Then, form that compelling, comprehensive story by looking at the broad picture in terms of where your research and the assets you would like to partner fit within the larger drug development landscape and fulfil an unmet need.

As the industry continues its effort to reduce the length of clinical trials and speed much-needed new therapies to market, the opportunities for partnerships continue to increase. Now is the time to move innovative vaccines and therapies from the lab to the clinic, and strategic planning can ensure developments align with current needs.

References

1. UC inventions at a glance (2020). University of California, [online], Available at: <https://www.universityofcalifornia.edu/infocenter/uc-inventions-glance>. (accessed: November 3, 2020).
2. Inserm Transfert, [online], Available at: <https://www.inserm-transfert.com/>. (accessed: November 3, 2020).
3. Activity Report (July 15, 2019). CNRS, [online], Available at: <https://www.cnrs.fr/fr/rapport-dactivite>. (accessed: November 3, 2020).
4. CNRS Innovation, [online], Available at: <https://www.cnrsinnovation.com/>. (accessed: November 3, 2020).
5. About OTD (2020). Harvard Office of Technology Development, [online], Available at: <https://otd.harvard.edu/about-otd/>. (accessed: November 3, 2020).
6. News: issued patents (2020). Harvard Office of Technology Development, [online], Available at: <https://otd.harvard.edu/news/tag/issued+patents>. (accessed: November 3, 2020).
7. AP-HP Research & Innovation press releases (2020). Clinical Research and Innovation Department (DRCI), [online], Available at: <http://recherche-innovation.aphp.fr/>. (accessed: November 3, 2020).
8. Seoul National University SNU R&DB Foundation, [online], Available at: <https://snurnd.snu.ac.kr/en/>?. (accessed: November 3, 2020).
9. Biomedical research entities capabilities (2020). Agency for Science, Technology and Research, Singapore, [online], Available at: <https://www.a-star.edu.sg/Research/research-entities-capabilities/biomedical-research>. (accessed: November 3, 2020).
10. Office of Technology Commercialization. The University of Texas MD Anderson Cancer Center, [online], Available at: <https://www.mdanderson.org/about-md-anderson/innovation/strategic-industry-ventures/office-of-technology-and-commercialization.html>. (accessed: November 3, 2020).
11. MD Anderson and Allogene Therapeutics announce strategic collaboration to accelerate advancement of allogeneic CAR T therapy (AlloCAR T) (October 15, 2020). The University of Texas MD Anderson Cancer Center, [online], Available at: <https://www.mdanderson.org/newsroom/md-anderson-and-allogene-therapeutics-announce-strategic-collaboration-to-accelerate-advancement-of-allogeneic-car-t-therapy-allocar-ttm.h00-159385890.html>. (accessed: November 3, 2020).
12. MD Anderson and Taiho Pharmaceutical announce collaboration to accelerate development of novel therapies for brain metastasis and other unmet medical needs (September 24, 2020). The University of Texas MD Anderson Cancer Center, [online], Available at: <https://www.mdanderson.org/newsroom/md-anderson-and-taiho-pharmaceutical-announce-collaboration-to-accelerate-development-of-novel-therapies-for-brain-metastasis-and-other-unmet-medical-needs.h00-159385101.html>. (accessed: November 3, 2020).
13. MD Anderson and Astex Pharmaceuticals announce strategic collaboration to accelerate clinical evaluation of therapies for patients with leukemia (September 8, 2020). The University of Texas MD Anderson Cancer Center, [online], Available at: <https://www.mdanderson.org/newsroom/md-anderson-astex-announce-collaboration-leukemia-patients.h00-159385101.html>. (accessed: November 3, 2020).
14. RECOVERY COVID-19 phase 3 trial to evaluate Regeneron's REGN-COV2 investigational antibody cocktail in the UK (September 14, 2020). University of Oxford News & Events,

[online], Available at: <https://www.ox.ac.uk/news/2020-09-14-recovery-covid-19-phase-3-trial-evaluate-regeneron-s-regn-cov2-investigational>. (accessed: November 3, 2020).

15. AstraZeneca and Oxford University announce landmark agreement for COVID-19 vaccine (April 30, 2020). AstraZeneca, [online], Available at: <https://www.astrazeneca.com/media-centre/press-releases/2020/astrazeneca-and-oxford-university-announce-landmark-agreement-for-covid-19-vaccine.html>. (accessed: November 3, 2020).
16. Myshko D. New Models for Academic Partnerships. PharmaVOICE. October 2014. <https://www.pharmavoices.com/article/academic-partnerships/>

About Clarivate

Clarivate™ is a global leader in providing solutions to accelerate the lifecycle of innovation. Our bold mission is to help customers solve some of the world's most complex problems by providing actionable information and insights that reduce the time from new ideas to life-changing inventions. Covering scientific and academic research, pharmaceutical, biotech and healthcare intelligence and intellectual property services, we help customers discover, protect and commercialize their inventions using our trusted subscription and technology-based solutions coupled with deep domain expertise. For more information, please visit clarivate.com.

Cortellis™ gives life to science by unlocking the hidden insights in data by curating broad and deep sources of intelligence to enable precise, actionable answers to specific questions across the R&D lifecycle — from discovery and clinical development through regulatory submission and commercialization. By supporting data-driven decisions, Cortellis helps pharmaceutical companies, biotech and medical device/diagnostic firms accelerate innovation. Over the past year, 80% of U.S. companies filing NMEs, 91% of companies achieving breakthrough therapy status and 70% of the top licensing deals were informed by Cortellis intelligence. For more information, please visit clarivate.com/cortellis.
