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EUROPEAN TRANSLATION REPORT 2018

EUROPE'S PIECE OF THE PIE

By Lauren Martz, Senior Writer

With China's rising infrastructure for life science innovation and the unabated growth of U.S. science, Europe has two cards to play that can help it compete globally: expertise in key core technologies and its centralized clearinghouses to support translation and access early stage investors.

The core strengths, which include cell and gene therapies, biomarker discovery, rare diseases and neurodegeneration, could position Europe as a driving force as precision medicine and genomics become central to biomedical innovation.

In the landscape of increasing cross-border innovation and investment, the competitive challenge doesn't come from a lack of high quality science emerging from Europe's top-tier universities.

"In terms of basic research capabilities, our history has been strong. The structure of DNA came out of the University of Cambridge, the first antibody was also discovered in the U.K., and CRISPR gene editing was even co-invented here," said Jeanne Bolger, VP of venture investments at the J&J Innovation-JJDC venture arm of Johnson & Johnson. "Academic institutions here are certainly capable of pulling their weight in innovation."

As always, the question is where the money will come from to translate the globally competitive research into homegrown technology and companies.

The picture is improving, according to five VCs and four leaders of European translational centers who spoke with BioCentury.

Since 2013, private funding raised by preclinical companies in Europe increased from \$316 million to \$585 million last year, peaking at almost \$957 million in 2016 (see Preclinical Financings: Private vs. Public).

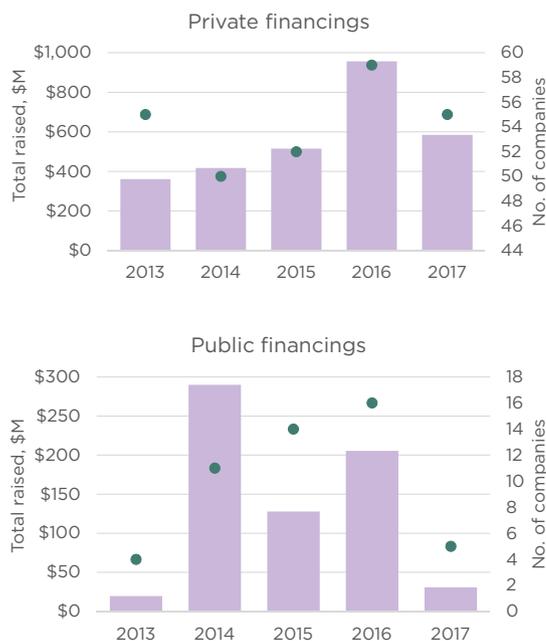
Still, BioCentury's annual review of the European biotech financing environment shows that figure remains about one-fifth of the amount raised in the U.S. for preclinical companies.

Meanwhile, China's rush to modernize could knock Europe off its perch as the second most prolific engine for innovation with commercial potential. That national investment in life science research is coupled with a huge influx of Chinese investor money into healthcare.

According to a McKinsey & Co. report presented on May 15 at BioCentury's 2018 BioEquity Europe conference, VC investment in China healthcare more than doubled from the prior year to

PRECLINICAL FINANCINGS: PRIVATE VS. PUBLIC

For European preclinical-stage companies, VC funding fell in 2017 from a large leap the year before, still showing an overall upward trend over five years in both the total amount raised and number of companies. The peak in both values in 2016 reflects several large-scale series B and C rounds. Public financing for preclinical companies is generally less predictable, with large rounds from a few companies such as **CRISPR Therapeutics AG** (NASDAQ:CRSP), which went public in 2016, having an outsized impact on the data. Debt is included in the figures. Source: BCIQ: BioCentury Online Intelligence



reach \$11.7 billion, while the size of Chinese VC and private equity funds nearly doubled to \$40 billion.

Playing to its strengths will help Europe compete with both a rising China as well as U.S., according to VCs and industry

executives who told BioCentury that Europe can leverage several advantages.

Local, small-scale manufacturing capabilities, led by the U.K.'s growing expertise in cell and gene therapy manufacturing, are essential for autologous cell therapies and other personalized medicine technologies.

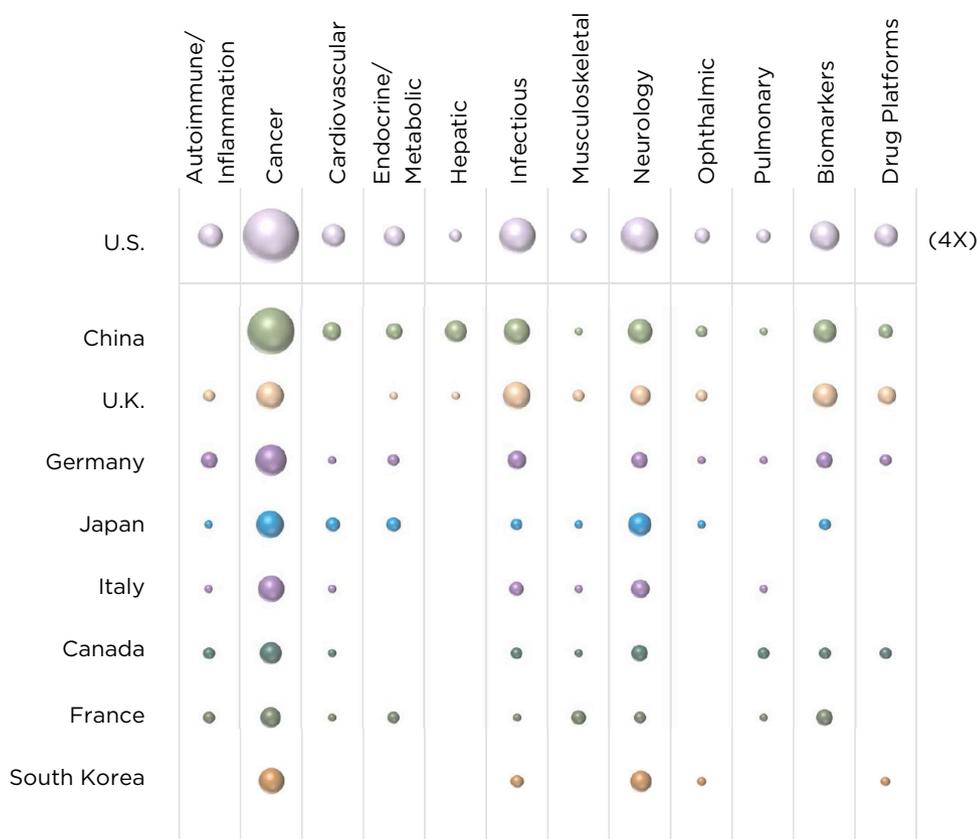
Extensive patient registries and genomics capabilities being developed throughout Europe can provide an edge in rare diseases and biomarker discovery.

Government and VC funds dedicated to translating discoveries in Alzheimer's disease (AD) could give the region a boost in a

RACE FOR SECOND PLACE

In 2017, the U.S. maintained a strong lead among European, Asian and American countries in academic translational science publications across the principal disease and technology categories highlighted in *BioCentury Innovations'* Distillery section, with the country's greatest output in cancer (147 articles). China came in second place with its highest output also in cancer (32 articles); it matched the U.S. in hepatic diseases (7 articles each). European strengths included biomarker studies, which utilize the genomics technologies thriving

there, and drug platforms, which include cell and gene therapies, a growth area in the U.K. and across Europe. While China ranked second for papers on the most disease areas, European countries combined outcompeted China in each disease and technology area except hepatic. Circle sizes for U.S. distillery items were shrunk to fit the chart and represent four times those of other countries'. Papers that included authors from multiple countries or disease categories were double counted. Source: *BioCentury Archives*



discipline where the lack of progress in clinical compounds is sending all players back to the drawing board.

And the rise of both virtual and brick-and-mortar translational organizations, funded with public and private money, is starting to knit the ecosystem together and create better links between academia, VCs and industry.

SELECTED CLOUD

Europe has consistently produced about one-quarter of the world's top translational research as recorded by BioCentury over the past seven years. The U.K. and Germany remain the

power players, producing 24% and 20% respectively of the European output (see "Distillery 2017").

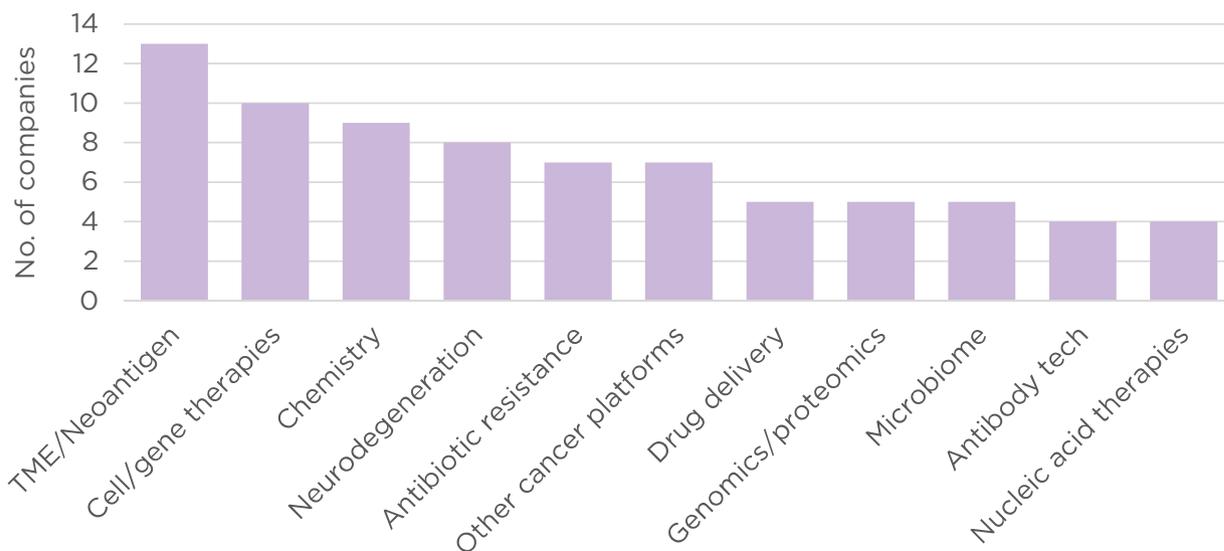
But in many areas of top translational science, Europe is facing competition from China for second place after the U.S.

This is reflected in the Distillery section of *BioCentury Innovations*, which tracks translational publications with commercial potential. By this measure, China produced more translational publications in cancer in 2017 than any country except the U.S., and was second or third in several other therapeutic areas, including infectious disease, neurology and cardiovascular disease.

CAPITAL TECHNOLOGIES

As Europe develops strengths in cell and gene therapies and neurodegeneration, VCs are beginning to take note, while continuing to fund companies that tap its historical expertise in areas like chemistry and antibodies. But funding of other newer areas of promise has lagged behind. For example, biomarkers was last year's top translational technology category, based on papers in the Distillery rather than funding. While biomarkers utilize genomics and proteomics, only five companies in the genomics and proteomics category attracted venture funding in the last three years. The chart shows technologies behind European preclinical companies that received venture funding in the last three years. Among 124 companies that had venture rounds in 2015, 2016 and/or 2017,

77 are using platforms that fall into 11 technology categories. The biggest cohort falls into the tumor microenvironment (TME)/neoantigen category, which includes companies developing therapeutics that modulate immune cells in the microenvironment and those that target cancer by homing drugs to microenvironment factors. The genomics/proteomics category includes companies using genetic information, protein expression and phenotypic screening to identify drugs, targets and/or biomarkers. The chart excludes technology categories with fewer than four companies, and single asset or single target companies that did not fall within any of the 11 categories. Source: *BCIQ: BioCentury Online Intelligence; company websites*



In hepatic disease, China matched the U.S. and outranked the European countries combined (see “Race for Second Place”).

European countries showed robust activity in select concentrated areas. The U.K. was second to the U.S. and ahead of China in biomarkers and in drug platforms — which includes cell and gene therapies. Germany was in fourth position for both.

European countries also competed with China in neurology and infectious disease, and were active in autoimmunity and inflammation — an area where China did not feature.

Venture investments are only beginning to reflect Europe’s potential strengths.

Between 2015 and 2017, VCs investing in European companies favored neoantigen and tumor microenvironment-related technology platforms, reflecting the trend to immuno-oncology.

That was followed by investments in companies largely using chemistry to increase target space (see “Capital Technologies”).

platforms, including CRISPR Therapeutics AG, a gene editing company.

Cell therapy plays Autolus Ltd., Cell Medica Ltd., Adaptimmune Therapeutics plc and Immutis Biotechnologies GmbH have raised an aggregate of almost \$600 million in venture financing since 2011 to develop a range of autologous and allogeneic CAR T and TCR cell therapies for cancer. Immutis is also developing bispecific TCR molecules. Adaptimmune went public on NASDAQ in 2015 and has raised almost \$300 million in public financing.

The gene therapy companies include Orchard Therapeutics Ltd. and Iterum Therapeutics Ltd., which together raised almost \$250 million in venture funding. Orchard, which spun out of University College London, was funded partly by Chinese investors — an example of how China’s growing biotech ecosystem is as much opportunity as competition for Europe’s innovators (see “China Comes to Europe.” *BioCentury* (May 18, 2018)).

“I think the trend will be more cross-border innovation, and that’s a good thing whether we’re going to the East or the West.”

Antoine Papiernik, Sofinnova Partners

Cell and gene therapies represented the third most common platform to receive venture funding.

Neurodegeneration and genomics companies now are starting to garner attention.

Other technologies where European companies are raising private financing include antibiotic resistance, the microbiome, nucleic acid therapies and antibodies.

CELL AND GENE STRENGTH

In terms of money raised, cell and gene therapy companies feature prominently among Europe’s venture magnets.

Of the 20 European companies that raised more than \$100 million since 2011, seven are based on cell or gene therapy

In addition, at least eight new cell and gene therapy companies were formed in the U.K. in the last five years, including GammaDelta Therapeutics Ltd., which was founded in 2016 to create $\gamma\delta$ T cell therapies to treat cancer, and Gyroscope Therapeutics Ltd., which launched the same year to develop gene therapies for ophthalmic diseases.

The VCs and industry executives called out three contributing factors to Europe’s strength in the space.

First, the U.K.’s Cell and Gene Therapy Catapult center for excellence is considered a leader in cell therapies.

Second, many cell therapies, particularly autologous therapies, can be manufactured on a small scale.

“Autologous cell therapies require a specific capability, but not a lot of financial muscle,” said Bolger. “They are a technology that

can and should be grown in the smaller environments found in Europe like the stem cell transplant labs.”

The third factor is a strong history in therapeutic areas that support cell therapy development, such as Germany’s stem cell expertise and resources. The U.K., Germany and Italy also all have a strong history of innovation in hematology and specific cancers, so moving into cell therapies is a “natural progression,” said Gabriella Camboni, CEO of Italian accelerator BiovelocITA.

Germany and Italy are home to at least 18 cell and gene therapy companies combined, 16 of which were formed more than 10 years ago. For example, MolMed S.p.A., founded in 1996, was one of the first companies to begin manufacturing stem cell therapies in Italy.

GOOD GOVERNMENT AND GENOMICS

Smaller European countries as well as heavier hitters like the U.K. have a play in biomarker discovery and Orphan diseases,

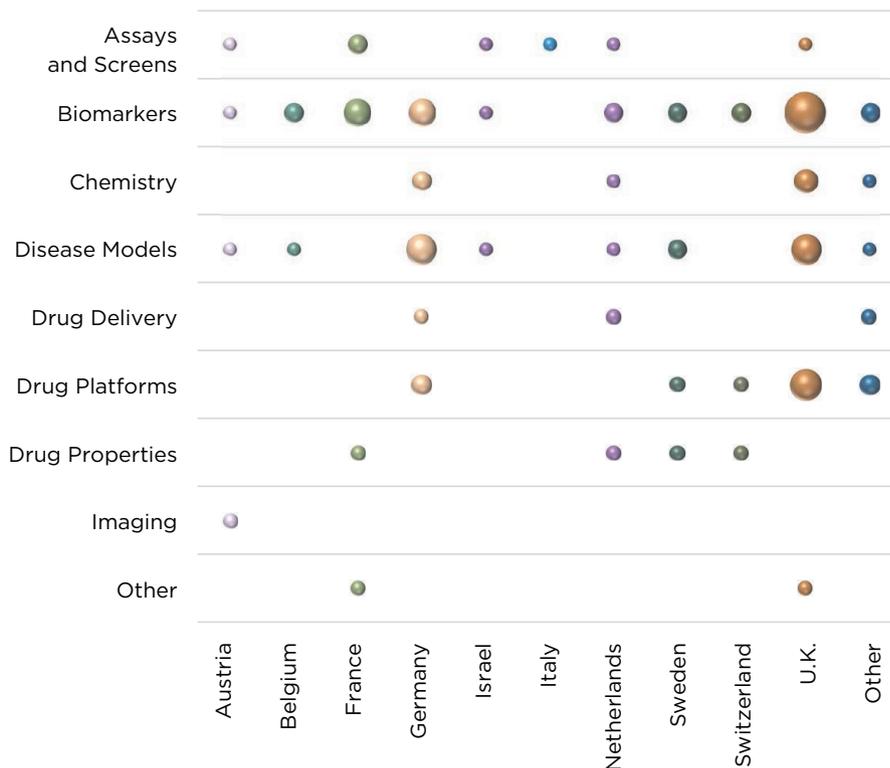
EUROPE’S TECHNOLOGY LEADERBOARD

European countries focused on the region’s core strengths in biomarker discovery, cell and gene therapy technologies, as well as cancer, infectious disease and neurology, in academic translational publications last year.

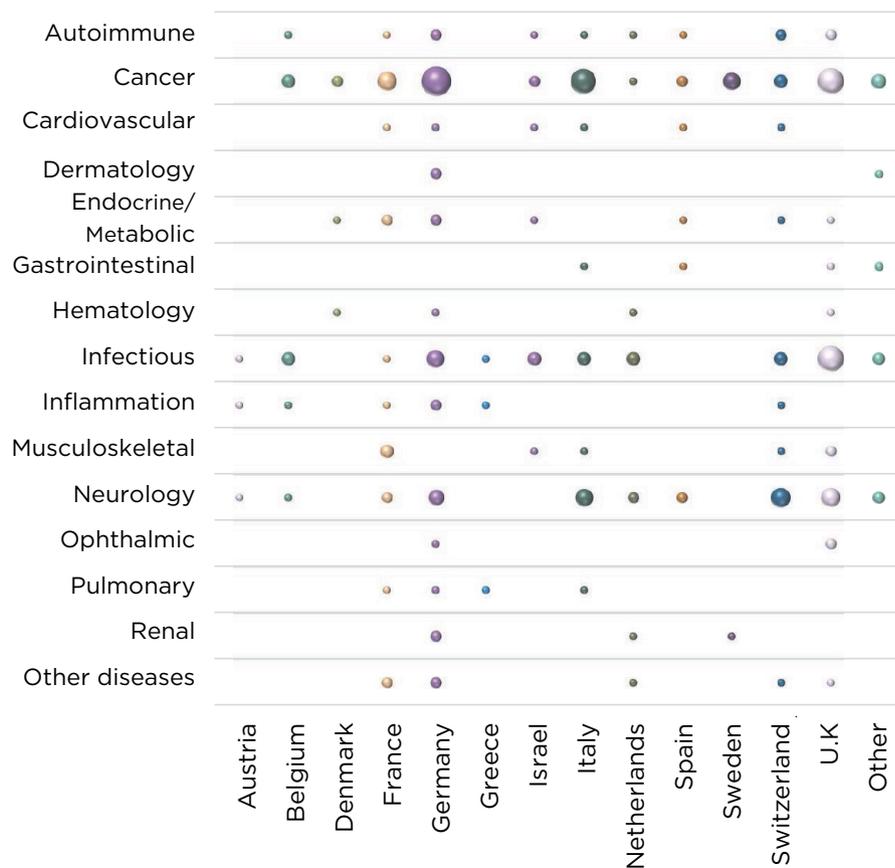
Technologies (first panel): In research papers highlighted in the Distillery section of *BioCentury Innovations* in 2017, European translational science clustered around biomarkers, disease models and drug platforms -- a category that houses cell and gene therapies. The U.K.’s primary focus was in biomarker research (nine articles); Germany and the U.K. were also active in developing disease models.

Disease areas (second panel): Cancer was covered by the largest number of research papers for most countries, with Germany (14 articles) outranking the U.K. (11 articles), but research also focused on infectious diseases, which includes antimicrobial resistance, and neurology, including neurodegeneration.

Circle sizes represent the number of articles written in each category. Countries with two or fewer papers were grouped into Other. Papers with authors from multiple countries or that described multiple technology types were included in each category’s count. Source: *BioCentury Archives*



Continued from previous page



largely due to the extensive national patient registries kept in many of those countries, as well as government initiatives in genomics.

The widespread interest in biomarkers is reflected in BioCentury’s Distillery, which has found papers on novel biomarkers emerging from almost all Europe’s leading countries in translational science (see “Europe’s Technology Leaderboard”).

Karolinska Institute professor Carl-Johan Sundberg told BioCentury the institute’s access to large patient registries includes “almost every single patient with a certain disease or intervention.”

Last year, Karolinska ranked second among European institutions in BioCentury’s Distillery ranking for translational publications (see “Translational Leaderboard: Top European Institutes”).

Rare diseases are also within reach for smaller biotechs without huge capital balances.

“In small countries such as Sweden, it is very tricky to bring projects forward in large spaces, but rare diseases have lower cash requirements,” said Sundberg.

Sweden’s leading rare disease company Swedish Orphan Biovitrum AB has 16 marketed products. The country is also home to Merozyne Therapeutics AB, which is developing a

treatment for a rare congenital muscular dystrophy and is backed by Novo Seeds, the early venture group of the Novo Nordisk Foundation's Novo Holdings A/S investment arm.

Government initiatives in several countries are providing access to data as well as an influx of money.

The U.K. government is putting both into genomics, through projects like Genomics England Ltd., a company funded by the government and owned by the Department of Health and Social Care, which has launched the 100,000 Genomes Project.

Genomics England aims to sequence 100,000 whole genomes from patients with rare diseases and cancers, and their relatives,

and make genomic sequencing a staple of patient care in the U.K.

According to Joanne Hackett, chief commercial officer of Genomics England, the U.K.'s NHS has records on more than 55 million people, some going back over 65 years, that give a full clinical snapshot of each individual.

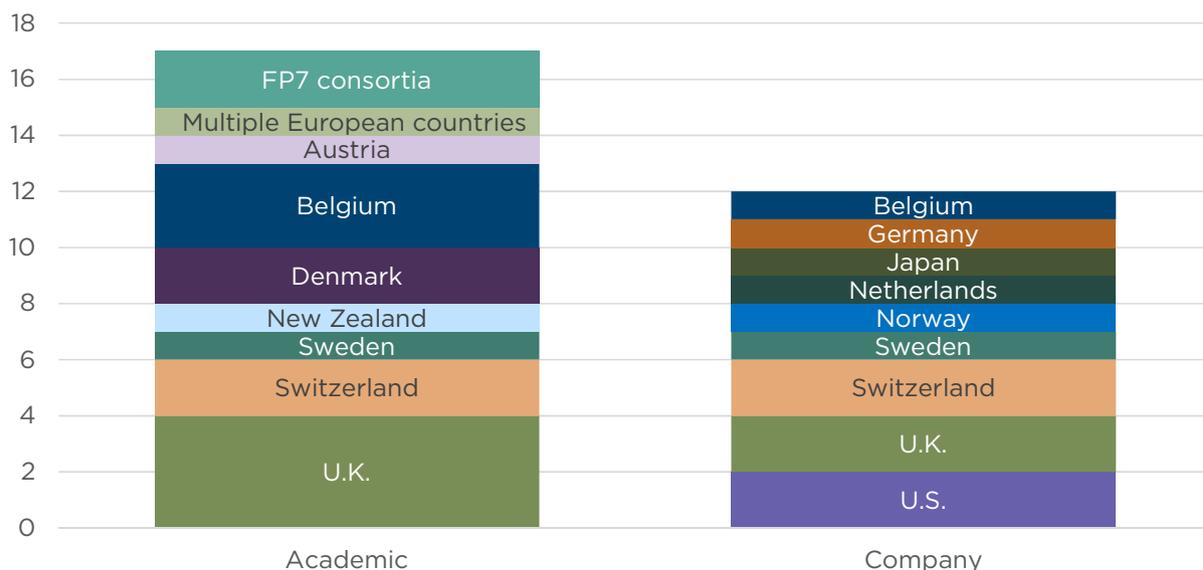
“What makes it attractive to industry is the access to data we’re working with, which helps for example with rare diseases,” she said.

Most European countries have multiple national and regional patient registries for various diseases.

ACADEMIC CONTRIBUTION

Academic innovators contributed to more than half the companies formed in Europe in 2017. Of the 28 newcos recorded by BioCentury, 17 were based on a technology that originated in academia, whereas the remaining 11 had technology that derived from a different company. One newco — Switzerland's **iOnctura S.A.** — launched with products licensed from both **Merck KGaA** (Xetra:MRK) and **Cancer Research UK** and is shown in both columns below. Two companies — **TM3 Therapeutics B.V.** in the Netherlands and **VitriCell S.A.**

in Belgium — were launched from European Seventh Framework Programme (FP7) consortia that comprised research institutions and companies in multiple countries, some outside of Europe, and are included in the academic column. One Belgian company in the academic column was launched by an individual with experience as a clinical trial principal investigator. Source: BioCentury analysis



Belgium, France, Germany, Italy, Spain, Sweden and the U.K. have the most extensive national patient registry systems.

In Iceland, genomics company deCODE genetics ehf, which was acquired by Amgen Inc. in 2012, collected genetic and medical information on about 500,000 individuals from Iceland and around the globe to mine for genetic risk factors of disease.

DEALING WITH DEMENTIA

Public and private initiatives in the U.K. also aim to put a dent in AD. In 2015, then-Prime Minister David Cameron pledged £300 million (\$408 million) to boost dementia research between 2015 and 2020.

Last year the Dementia Research Institute launched with £250 million (\$340 million) from the MRC, Alzheimer's Society and Alzheimer's Research U.K.

SV Health Investors, with a footprint in London, Boston and San Francisco, launched the Dementia Discovery Fund in 2015 to develop therapies against unexploited targets in AD. Last November, Bill Gates made a personal investment of \$50 million into the fund, raising its total disclosed capital to \$150 million, and it received an undisclosed investment from the National Football League Players Association.

The Dementia Discovery Fund has formed six companies, three collaborations and two additional projects in DNA damage response and neuroinflammation.

While the bulk of clinical compounds for AD focus on β -amyloid and tau, two preclinical European companies are pursuing different targets. Irish blood-brain barrier delivery startup Junction Therapeutics Ltd., launched in 2016, has the siRNA candidate JT-02 targeting CLDN5 and OCLN. Norwegian company Pharmasum Therapeutics A/S, launched two years earlier, has the DYRK1A inhibitor PST-900.

At least 43 other neurology companies have been launched in Europe in the last five years, including Idorsia Ltd., which was founded to develop drug candidates spun out of Actelion Ltd. Idorsia listed last year on the SIX Swiss Exchange; its market cap is \$2.5 billion.

POCKETS OF PROMISE

However, VCs agree the fragmented research and capital systems in Europe make it harder to produce the same level of innovation and value as competitors overseas.

"In the U.S., there is a more cohesive market, not to mention more centralized basic research funding through the NIH and a more interconnected VC network," said Karolinska's Sundberg.

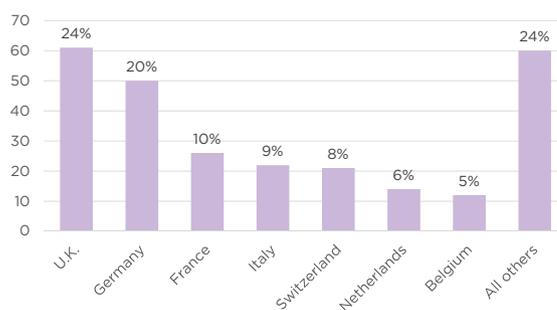
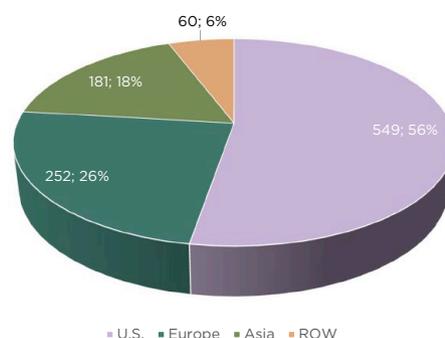
DISTILLERY 2017

Europe has consistently ranked second behind the U.S. in the strength of academic translational science as measured by the source of papers highlighted in BioCentury Innovation's Distillery section, but Asian innovators are not far behind. The Distillery contains synopses of papers describing technologies or discoveries with commercial potential, selected from the top 41 biomedical journals.

Top: Similar to 2016, global translational research was led by the U.S., followed by Europe, which produced less than half as many papers (252) and represented 26% of the translational pie. Asia increased slightly from the previous year from 13% to 18%, but remained in third place. China accounted for 89 of those items, making it the number two country overall, representing 9% of the pie worldwide.

Bottom: U.K. took the lead from Germany this year, while Belgium moved up into the European leaderboard as Spain dropped out.

Percentages do not sum to 100% because some papers include authors from multiple regions which led to some double counting. Source: BioCentury Archives



J&J's Bolger noted that the diversity of cultures, funding environments, currency and language makes it hard for VCs to find and access assets across Europe. "Unlike the U.S. where there is more of a startup culture, there are very strong social structures that allow people to stay in academia for their entire careers, rather than being rewarded for stepping in and out of academia," she said.

Government-backed centralized funding initiatives in Europe have made headway by creating networks that bring industry and academia closer. For example, the Innovative Medicines Initiative (IMI), the public-private partnership between the European Commission and European Federation of Pharmaceutical Industries and Associations (EFPIA), is tasked with accelerating drug development and enabling company formation.

Vcs and KOLs said that an important recent addition is the clearinghouse-like constructs founded in many European countries to foster innovation nationally and make the countries' technologies more visible to investors across Europe.

Bolger noted that the hub and spoke model — like that adopted by JJDC and various European VCs — can help bridge the barriers by connecting investors with science at scattered research centers.

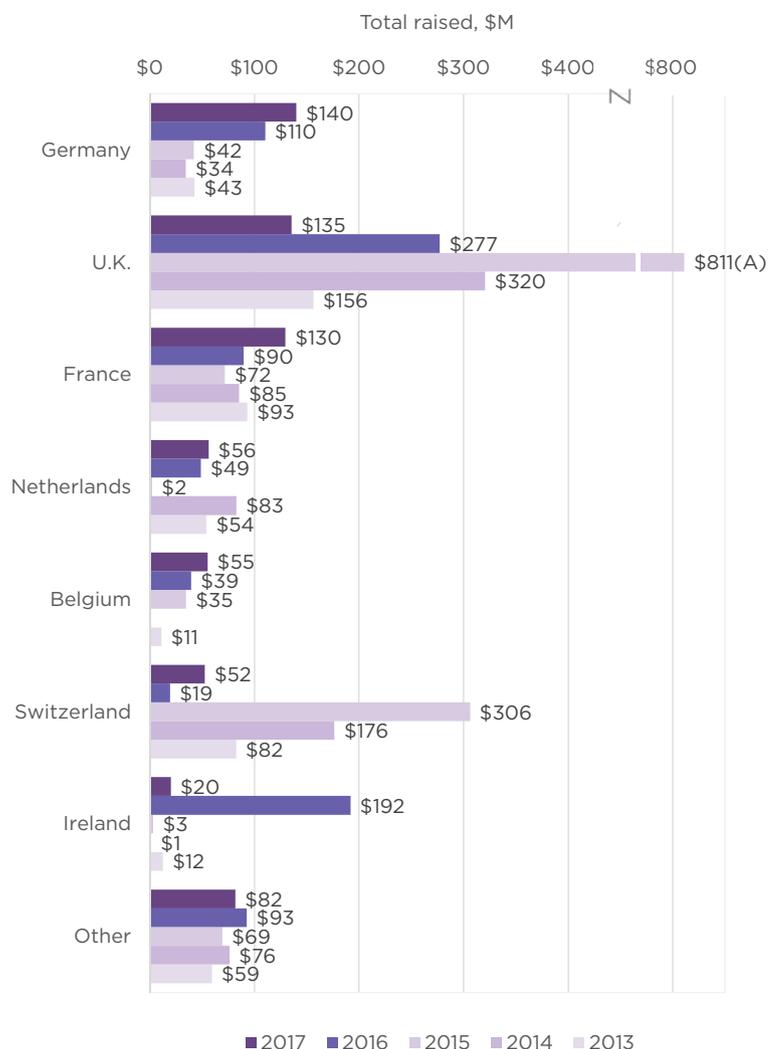
These include accelerators such as Italy's BiovelocITA, incubators like J&J's JLABS in Belgium, and organizations such as the U.K.'s Francis Crick Institute, Germany's Lead Discovery Center GmbH and Israel's Yeda Research and Development Co. Ltd., which are dedicated to translating research from individual institutions or innovation hubs.

BiovelocITA is backed by Sofinnova Partners and undisclosed private Italian investors.

The Crick facilitates translation from several top U.K. institutions and research

SEED AND SERIES A ROUNDS IN EUROPE

Although the U.K. has historically led Europe in venture financing for early stage companies, Germany is emerging as a new leader. The chart includes seed and series A funding received by European companies between 2013 and 2017. Totals include all disclosed seed and series A rounds, regardless of year of founding, as well as uncategorized rounds raised by companies founded within four years of the financing. For companies that had multiple uncategorized rounds over \$50 million within the four years, only the first round was included. Tranched rounds have been broken into the year in which each tranche closing occurred. (A) 2015 U.K. plot not drawn to scale. Source: BCiQ: BioCentury Online Intelligence



centers. LDC is affiliated with the Max Planck Institutes, and Yeda is the Weizmann Institute of Science's tech transfer company.

According to LDC's Michael Hamacher, these organizations are starting to bridge the academic and investment communities. He said German VCs remained wary of the biotech industry for almost a decade following the 2008 financial crisis, but "private money is suddenly available again, in part because of organizations like the LDC and CD3 are helping to showcase high-quality projects."

Catholic University Leuven's Centre for Drug Design and Discovery (CD3) is a fund and technology transfer platform for the Belgian university.

Hamacher is head of finance & human resources and of business development & public relations at LDC.

ACADEMIC SCOREBOARD

Europe's academics provided the technology behind more than half of the new European companies recorded by BioCentury last year.

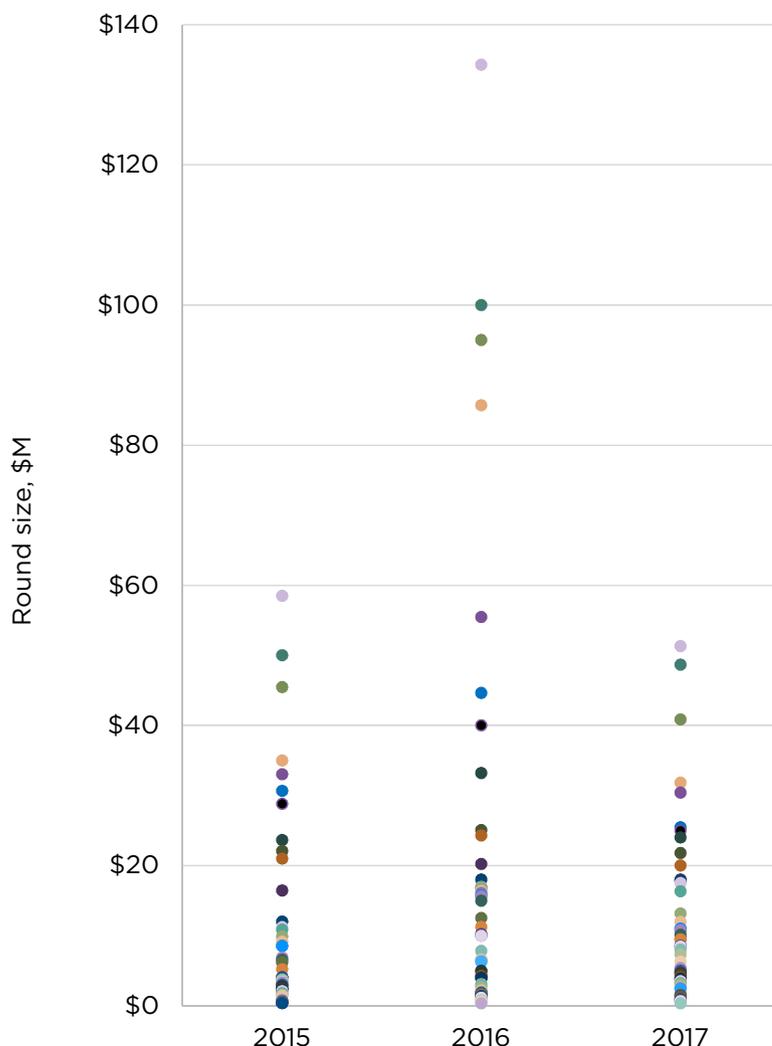
Of the 28 newcos, the technology for 17 originated in a university or research institute, whereas 11 were from technology developed inside a company. The U.K. led in both categories, producing four companies from academia and two from industry (see "Academic Contribution").

Only six of the 17 companies from academia have disclosed their financings, which ranged from CHF 2.4 million (\$2.5 million) for cancer drug screening company Tolremo Therapeutics AG to €27 million (\$31.8 million) for Belgian antibacterial peptide therapeutics company Aelin Therapeutics N.V. (see "Top Academic Spinouts").

Two European newcos sourced their technology from U.S. companies:

PRECLINICAL FINANCINGS

Although venture rounds above \$50 million are becoming more common for preclinical biotechs in the U.S., the same trend hasn't appeared in Europe. Although five companies passed the mark in 2016, only one did so last year; Bicycle Therapeutics Ltd. raised a \$51,328,000 million Series B round. Still, preclinical European companies are raising larger investments than in past years. Nine preclinical European companies raised \$20-\$50 million in venture rounds last year, compared with six in 2016. Each dot in the chart below represents a company's total fundraising for the respective year. Tranches are recorded in the year the funds were received. Source: BCIQ: BioCentury Online Intelligence



“In small countries such as Sweden, it is very tricky to bring projects forward in large spaces, but rare diseases have lower cash requirements.”

Carl-Johan Sundberg, Karolinska Institute

Rejuvenate Biomed N.V., which spun out of J&J, and Ayala Pharmaceuticals Inc., which licensed molecules from Bristol-Myers Squibb Co.

Although the U.K. has for the last few years attracted the most seed and series A funding, Germany took the top spot in 2017 with \$140 million. The U.K. followed with \$135 million, less than half the amount British biotechs received in 2016, and France followed closely with \$130 million (see “Seed and Series A Rounds in Europe”).

But the trend to higher series A valuations seen in the U.S. has not shown up in Europe, where no series A rounds have surpassed \$50 million in the last two years. All told, European preclinical companies raised five large venture rounds that exceeded \$50 million in 2016, and only Bicycle Therapeutics Ltd. crossed that mark last year with a \$51.3 million series B round (see “Preclinical Financings”).

Hamacher thinks uncertainty surrounding Brexit might be responsible for the shift away from the U.K.

“I have at least a feeling that Brexit has VCs shying away from the U.K., while mid-Europe is developing more and more down its innovative path. I think Belgium, Germany and Sweden are the emerging leaders,” he said.

Abingworth Management Ltd. partner Genghis Lloyd-Harris agreed several other countries are “punching above their weight.”

Belgium and the Netherlands have a “disproportionate number of biotech companies coming out of them,” he said, reflecting the relative abundance of venture capital in the Benelux area and the level of innovation.

LDC CEO Bert Klebl noted that France and Belgium have “excellent government support for spinouts,” as do Denmark and Sweden, which also have a strong pharma history.

Denmark spun out two Novo Seeds-backed newcos from academia last year, cancer antibody-drug conjugate company

TRANSLATIONAL LEADERBOARD: TOP EUROPEAN INSTITUTES

Among the top 75 institutions worldwide that have published translatable research over the past five years, 10 are from Europe, a drop from 11 in last year’s analysis. Institutional ranking was based on the total number of Distillery items published in BioCentury Innovations from each institution between 2013-2017. (A) Institut National de la Santé et de la Recherche Médicale (INSERM) totals include labs run by the institute at various French universities. (B) Tie; Source: BioCentury Archives

INSTITUTION	DISTILLERY RANK
University of Oxford	28
Karolinska Institute	34
University of Cambridge	39
Institut National de la Santé et de la Recherche Médicale (INSERM) (A)	42 (B)
Weizmann Institute of Science	42 (B)
German Cancer Research Center (DKFZ)	47
University College London	54
Catholic University Leuven	68
Swiss Federal Institute of Technology Lausanne (EPFL)	70
The Institute of Cancer Research	74

ADCendo ApS and obesity startup Antag Therapeutics ApS. In Sweden, Orexo AB spun out inflammation company Gesynta Pharma AB and Lund University spun out Abarceo Pharma AB, which is hitting an undisclosed diabetes target to correct β cell dysfunction.

Several VCs also mentioned Poland as an emerging biotech region, where health technology is beginning to thrive.

TOP ACADEMIC SPINOUTS

Of the 17 companies with academic origins founded in Europe in 2017, six have disclosed financings. Among those, three were formed around infectious disease platforms and two have target and drug identification platforms, capitalizing on Europe's strengths in genomics and proteomics. Source: BCIQ: BioCentury Online Intelligence

COMPANY	STATUS	TOTAL RAISED	LOCATION	TECHNOLOGY	ACADEMIC ORGANIZATION	THERAPEUTIC AREA	INVESTORS
Aelin Therapeutics N.V.	Preclin	€27M (\$31.8M)	Leuven, Belgium	Pept-in technology for designing peptides against intracellular targets based on protein aggregation	Flanders Institute for Biotechnology (VIB) and affiliates Catholic University Leuven; Free University of Brussels (VUB); Ghent University	Infectious; cancer	LSP; PMV N.V.; Novartis Venture Fund; Boehringer Ingelheim Venture Fund; Fund+
VirionHealth Ltd	Preclin	£13M (\$17M)	Coventry, U.K.	Platform to create defective viral particles that mimic and outcompete infectious viruses	University of Warwick	Infectious	Abingworth Management
Critical Pressure Ltd.	Preclin	£10M (\$13.2M)	Cambridge, U.K.	Small molecule dimethylarginine dimethylaminohydrolase 1 (DDAH1) inhibitor	Cambridge University; Glasgow University	Infectious	Medicxi
Scenic Biotech B.V.	Preclin	€6.5M (\$7.3M)	Amsterdam, the Netherlands	Cell-seq mutagenesis screening platform to identify drug targets in a human cell line	Netherlands Cancer Institute; Oxford University	Cancer	BioGeneration Ventures; INKEF Capital; Oxford Sciences Innovation plc
Antag Therapeutics ApS	Preclin	€2.7M (\$3M)	Copenhagen, Denmark	Glucose-dependent insulinotropic polypeptide (GIP) antagonist peptides	University of Copenhagen	Endocrine/metabolic	Novo Seeds
Tolremo Therapeutics AG	Preclin	CHF2.4M (\$2.5M)	Zurich, Switzerland	Cancer drug screening platform	ETH Zurich	Cancer	Undisclosed

“Critical masses are developing around a single luminary or institution across Europe,” and the trend is likely to continue and shift across the Continent, said SV Health partner Houman Ashrafiyan.

IMPACT FROM THE EAST

Traditionally, EU innovators have looked to the West to benchmark and build on technological advances. Now, innovations and capital from Asia are coming on the radar.

“In China, the push factor is the availability of capital, and the pull factor is the desire to import innovation and healthcare capability,” said Ashrafiyan.

However, the investors agreed the influx of Chinese innovation and cash is in its very early stages.

A few cross-border investment teams have started to show up, including Vivo Capital and Decheng Capital, which are each located in both the San Francisco Bay Area and China.

Sofinnova's Antoine Papiernik noted that most cross-border investment teams straddle the U.S. and China, but he is convinced Europe will play a role soon. “In the next five years, we could have the same conversation with a lot of examples,” he said.

The VCs also agreed that so far, little Chinese money appears to be making its way into early stage companies and preclinical technologies.

One reason is investors usually want to be very close to newcos, said Bolger, who isn't convinced there will be a large Asian presence at the seed and series A level any time soon.

Medicxi partner Jon Edwards told BioCentury he senses no fear or urgency that Asian innovators could disrupt the EU ecosystem.

However, while BiovelocITA co-founder and president Silvano Spinelli welcomes the change, he cautioned that fast technological development coupled with more relaxed regulations in areas such as gene editing could make China a more disruptive force than others are expecting.

Papiernik and other investors are generally positive about the impact that increased Asian competition and funding will have on the European life sciences.

“I think the trend will be more cross-border innovation, and that’s a good thing whether we’re going to the East or the West. Ultimately, companies benefit from having relationships, with more money, visibility and options for exit,” he said. █

COMPANIES AND INSTITUTIONS MENTIONED

Abarceo Pharma AB, Malmö, Sweden
Abingworth Management Ltd., London, U.K.
Adaptimmune Therapeutics plc (NASDAQ:ADAP), Abingdon, U.K.
ADCendo ApS, Copenhagen, Denmark
Aelin Therapeutics N.V., Leuven, Belgium
Amgen Inc. (NASDAQ:AMGN), Thousand Oaks, Calif.
Antag Therapeutics ApS, Copenhagen, Denmark
Autolus Ltd., London, U.K.
Ayala Pharmaceuticals Inc., Rehovot, Israel
Bicycle Therapeutics Ltd., Cambridge, U.K.
Bristol-Myers Squibb Co. (NYSE:BMJ), New York, N.Y.
Catholic University Leuven, Leuven, Belgium
Cell and Gene Therapy Catapult, London, U.K.
Cell Medica Ltd., London, U.K.
CRISPR Therapeutics AG (NASDAQ:CRSP), Zug, Switzerland
European Federation of Pharmaceutical Industries and Associations, Brussels, Belgium
Francis Crick Institute, London, U.K.
GammaDelta Therapeutics Ltd., London, U.K.
Genomics England Ltd., London, U.K.
Gesynta Parma AB, Solna, Sweden
Gyroscope Therapeutics Ltd., Stevenage, U.K.
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Innovative Medicines Initiative (IMI), Brussels, Belgium
Iterum Therapeutics Ltd., Dublin, Ireland
Johnson & Johnson (NYSE:JNJ), New Brunswick, N.J.
Junction Therapeutics Ltd., Dublin, Ireland
Karolinska Institute, Stockholm, Sweden

Lead Discovery Center GmbH, Dortmund, Germany
Lund University, Lund, Sweden
Max Planck Society, Munich, Germany
Medicxi, London, U.K.
Merozyne Therapeutics AB, Lund, Sweden
MolMed S.p.A. (Milan:MLM), Milan, Italy
Novo Holdings A/S, Hellerup, Denmark
Orchard Therapeutics Ltd., London, U.K.
Orexo AB (SSE:ORX), Uppsala, Sweden
Pharmasum Therapeutics A/S, Tromsø, Norway
Rejuvenate Biomed N.V., Beerse, Belgium
Sofinnova Partners, Paris, France
SV Health Investors LLP (SV Life Sciences), Paris, France
Swedish Orphan Biovitrum AB (SSE:SOBI), Stockholm, Sweden
University of Cambridge, Cambridge, U.K.
University College London, London, U.K.
Vivo Capital LLC, Palo Alto, Calif.
Weizmann Institute of Science, Rehovot, Israel
Yeda Research and Development Co. Ltd., Rehovot, Israel

TARGETS

CLDN5 - Claudin 5
DYRK1A - Dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1A
OCLN - Occludin

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