

Innovative academic startups 2016

Brady Huggett

In a culmination of previous trends, this year's ranking of academic spinouts on the basis of venture capital A rounds in 2016 resulted in a list exclusively of firms based in the United States. Recognizing that innovation is global, we have also listed in **Table 1** two top-capitalized startups from Europe and Asia. Overall, US biopharma

startups dwarf firms from other areas in terms of capitalization and number (**Fig. 1**); Ireland and the UK are punching above their weight; European companies continue to be comparatively under-capitalized. Those few biotech firms started in China were funded exceptionally well (**Table 2**).

Table 1 Top ten A rounds in 2016 for innovative academic startups (as of Dec. 15)

Company	Amount raised (millions); date; investors	Scientific founders	Other founders	Focus
Tioma Therapeutics (Brisbane, California)	\$86; Aug. 16; RiverVest Venture Partners, Novo Ventures, Roche Venture Fund, SR One	William A. Frazier, Washington State University	NA	Anti-CD47 mAbs that act selectively on leukemia cells and induce membrane potential discharge from mitochondria
Forty Seven (Palo Alto, California)	\$75; Feb. 24; Lightspeed Venture Partners, Sutter Hill Ventures, Clarus, GV	Irv Weissman, Ravi Majeti, Mark Chao, Jens Volkmer, all at Stanford University	NA	Humanized anti-CD47 mAb (Hu5F9-G4) in phase 1 for acute myeloid leukemia and solid tumors
C4 Therapeutics (Cambridge, Massachusetts)	\$73; Jan. 7; Cobro Ventures, Cormorant Asset Management, The Kraft Group, EG Capital Group, Roche, Novartis, angel investors	Ken Anderson, Nathanael Gray, both at Harvard	Marc Cohen, serial entrepreneur; Jay Bradner, Novartis	Conjugates of phthalimide with small-molecule inhibitors (degronimids) that recruit the ubiquitin-proteasome system to selectively degrade target proteins
Fulcrum Therapeutics (Cambridge, Massachusetts)	\$55; July 19; Third Rock Ventures	Bradley Bernstein, Harvard; Michael Green, University of Massachusetts; Rudolf Jaenisch, Massachusetts Institute of Technology; Jeannie T. Lee, Harvard; Danny Reinberg, New York University	NA	Diseased tissue screens differentiated from patient-derived induced pluripotent stem cells using CRISPR-Cas9 gene editing or small molecules to identify leads to address misregulated protein expression gene regulation in fragile X syndrome and facioscapulohumeral muscular dystrophy
Bamboo Therapeutics (Chapel Hill, North Carolina)	\$49.5; Feb. 11; CureDuchenne, and other undisclosed investors; Pfizer (New York) acquired 78% of stock in August	R. Jude Samulski, Xiao Xiao; both at University of North Carolina at Chapel Hill	NA	Adeno-associated viral vector serotype-9-based gene therapies: prioritizing mini-dystrophin for Duchenne muscular dystrophy; but also gigaxonin for giant axonal neuropathy, frataxin for Friedreich's ataxia and aspartoacylase for Canavan's disease
Magenta Therapeutics (Cambridge, Massachusetts)	\$48.5; Nov. 16; Third Rock Ventures, Atlas Venture, GV, Access Industries Inc., Partners Innovation Fund	David Scadden, Harvard; Derrick Rossi, Harvard; John Dipersio, Washington University St. Louis School of Medicine; Robert Negrin, Stanford; Luigi Naldini, TIGET, Milan; Alan Tyndall, University of Basel	Jason Gardner, Atlas Ventures	mAbs to target stem cells to reduce the need for cytotoxic conditioning regimens (for example, <i>Nat. Biotechnol.</i> 34 , 738-745, 2016); agents to improve stem cell harvesting; agents to improve stem cell expansion
Pliant Therapeutics (Redwood City, California)	\$45; Feb. 18; Third Rock Ventures	Dean Sheppard, Bill DeGrado, Hal Chapman, Bradley Backes; all at University of California, San Francisco	NA	Small-molecule targeting integrin $\alpha_v\beta_3$ to treat fibrosis in pulmonary, hepatic and other inflammatory diseases
Yumanity Therapeutics (Cambridge, Massachusetts)	\$45; Feb. 10; Fidelity, Redmile Group, Alexandria Venture Investments, Biogen Inc., Sanofi-Genzyme BioVentures, Dolby Family Ventures	Susan Lindquist, Whitehead Institute; Vikram Khurana, Harvard; Chee Yeun Chung, Harvard; Daniel Tardiff, Whitehead Institute	NA	Small-molecule hits in screens of yeast engineered to overexpress misfolded proteins, cross-validated in neurons differentiated from patient-derived induced pluripotent stem cells and retested in yeast to elucidate mechanism. Lead is a compound targeting NEDD4 family E3 ubiquitin protein ligase RPS in Parkinson disease
Inivata (Cambridge, UK)	\$44.9; Jan. 26; Imperial Innovations Group, Cambridge Innovation Capital, Johnson & Johnson Development, Woodford Investment Management	Nitzan Rosenfeld, Davina Gale, James Brenton, all at University of Cambridge; Tim Forshew, University College London	NA	Liquid biopsy of circulating tumor DNA using barcode digital PCR for detection of sequences in a 35-gene panel
Prenetics (Hong Kong, China)	\$10; March 16; Ping An Ventures, Venturra Capital, Capital Union Investments, 500 Startups, Coent Venture Partners	Lawrence Tzang, Hong Kong Society for Behavioral and Neural Genetics	Danny Yeung, SXE Ventures	Pharmacogenomics DNA testing by non-invasive buccal swab to predict patient responses and hypersensitivity to drugs susceptible to metabolism by cytochrome P450 and 41 other genes in cardiovascular, psychiatric, pain and metabolic disease (among others)

mAb, monoclonal antibody. Source: BCIQ: BioCentury Online Intelligence; company materials.

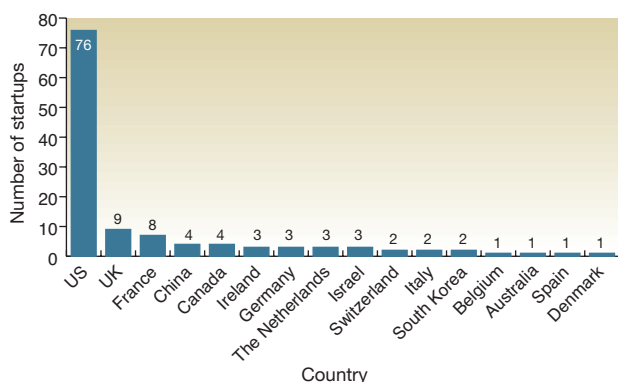


Figure 1 Number of startups by country in 2016. A-2 rounds, and rounds of undisclosed amounts, left out. NA, not applicable. Source: BCIQ: BioCentury Online Intelligence

Brady Huggett is business editor at Nature Biotechnology.

Table 2 Total and average A-round amounts by country in 2016

Country (number of rounds)	Total amount raised (\$ millions)	Average raised per round (\$ millions)
China (4)	324.4	81.1
Ireland (3)	96.9	32.3
United States (76)	2,339.0	30.8
Belgium (1)	26.7	26.7
Germany (3)	80.0	26.7
Canada (4)	93.9	23.5
United Kingdom (9)	190.2	21.1
The Netherlands (3)	48.4	16.1
South Korea (2)	31.5	15.8
Australia (1)	15.0	15.0
Spain (1)	12.5	12.5
Denmark (1)	12.0	12.0
Israel (3)	35.8	11.9
Switzerland (2)	16.7	8.3
France (8)	49.4	6.2
Italy (2)	9.2	4.6

A-2 rounds, and rounds of undisclosed amounts, left out. Source: BCIQ: BioCentury Online Intelligence