

# Biotech patents—business as usual?

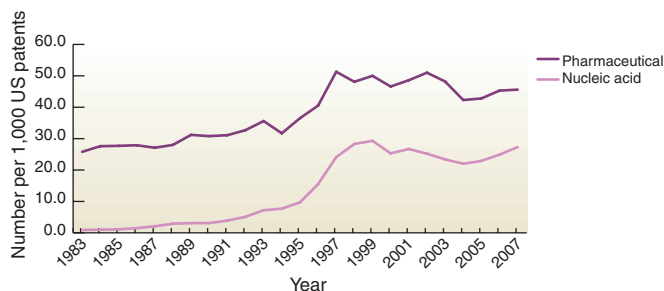
Stacy Lawrence

Patenting of biotech inventions in 2007 remained steady, but below the highs of 2002. Last year, Genentech (So. San Francisco, CA, USA) was issued the highest number of new patents, overtaking the University of California system. The University of Michigan (Ann Arbor, MI, USA),

Immunes (Seattle), Roche Diagnostics (Basel), Schering (Kenilworth, NJ, USA) and Syngenta (Basel) all entered the top 20. Patents in cardiovascular disease and oncology continued to dominate. Obtaining a patent in Europe remains more costly than elsewhere.

## Patent share for biotech and pharmaceutical terms

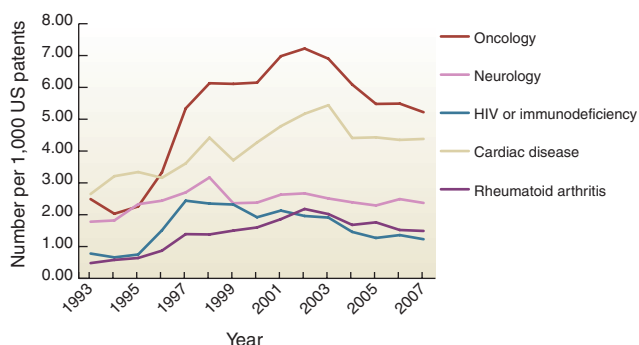
Biotech and pharma patenting in the United States continues to climb as a share of total patents from a low in 2004.



Based on the appearance of the words “pharmaceutical” or “nucleic acid” in the specification of approved US Patent and Trademark Office patents. Source: Finnegan, Henderson, Farabow, Garrett & Dunner

## US patent share by therapeutic area

Patents related to specific disease areas declined slightly, but cardiac disease or oncology continue to figure prominently.



2007 US Patent and Trademark Office data. Oncology, cardiac disease and neurology include related terms. Based on a search of terms in the specification section of patent or application. Source: Finnegan, Henderson, Farabow, Garrett & Dunner

## Patent cost comparison at the major patent offices

	File and research costs (€)	Examination cost (€)	Delivery cost (€)	Fees (€)	Translation (€)	Wage (€)	Total (€)
European Union	810 + 510	1431	715	16,790	12,600	1,700	49,900
US	690	0	1,210	2,730	NA	5,700	10,330
Japan	210	1,100	850	5,840	NA	8,450	16,450

Source: OECD

Corrected after print 8 May 2009

## Selected US institutions with biotech IP

Institution	2006 total R&D revenue (\$ millions)	Biotech intellectual property (primary licensee)
University of California system	193.4	Hepatitis B surface antigen vaccine (Chiron), detachable coils for treating intracranial aneurysms (Boston Scientific) and bovine growth hormone (Monsanto)
New York University	157.0	Remicade/infliximab in autoimmune disease (Centocor and Johnson & Johnson)
Stanford University	61.3	Cohen-Boyer patents
University of Minnesota	56.0	Ziagen/abacavir for HIV (GlaxoSmithKline)
University of Florida	49.0	Trusopt/dorzolamide for glaucoma (Merck)
University of Rochester	38.0	HibTITER/conjugate <i>Haemophilus influenzae</i> type b meningitis vaccine and Prevnar/7-valent vaccine comprising saccharides of <i>Streptococcus pneumoniae</i> capsular antigens for meningitis (Wyeth)
Northwestern University	29.9	Lyrica/pregabalin for nerve pain and fibromyalgia (Pfizer)
University of Massachusetts	27.2	RNAi technology (Alnylam)
Mount Sinai School of Medicine	20.1	CP-400 small molecule for oncology (Clavis Pharma), plasmid rescue technology (MedImmune/GlaxoSmithKline)
University of Utah	16.3	Actiq drug-delivery technology (Cephalon), <i>BRCA1/BRCA2</i> genetic tests for breast cancer (Myriad)

Source: Forbes

## Top 20 organizations with the most US biotech patents issued

2007		2006	
Institution	Number of new patents	Institution	Number of new patents
Genentech	264	University of California	134
University of California	129	Genentech	124
Pioneer Hi-Bred	123	US government	84
US government	113	Pioneer Hi-Bred	81
E.I. du Pont de Nemours	72	E.I. du Pont de Nemours	80
Applera	53	Applera	62
Monsanto	50	Human Genome Sciences	59
Agilent Technologies	46	Agilent Technologies	55
Merck	39	Millennium	54
Bayer	38	University of Texas	49
Human Genome Sciences	37	Amgen	41
Millennium	33	Affymetrix	37
University of Texas	33	Merck	34
Amgen	33	Stanford	34
Immunes	33	MIT	34
Roche Diagnostics	33	Monsanto	33
ISIS	30	Cornell	33
Schering	30	Wisconsin Alumni Research Foundation	31
University of Michigan	25	Sanofi or Aventis	30
Cornell	25	Chiron	29
Syngenta	24		

US Patent and Trademark Office patents featuring the term ‘nucleic acid’ in the specification section of the patent. Source: Finnegan, Henderson, Farabow, Garrett & Dunner University/research institution, Government, Business

Stacy Lawrence is a Senior Writer at BioCentury

## Corrigendum: Highly efficient neural conversion of human ES and iPS cells by dual inhibition of SMAD signaling

Stuart M Chambers, Christopher A Fasano, Eirini P Papapetrou, Mark Tomishima, Michel Sadelain & Lorenz Studer  
*Nat. Biotechnol.* 27, 275–280 (2009); published online 1 March 2009; corrected after print 16 March 2009

In the version of this article initially published, the unit (nM) for the amount of TGF- $\beta$  inhibitor (Tocris) reported in the Methods section “Neural induction” was incorrect. The correct unit is  $\mu$ M. The error has been corrected in the HTML and PDF versions of the article.

## Corrigendum: Targeted and genome-scale strategies reveal gene-body methylation signatures in human cells

Madeleine P Ball, Jin Billy Li, Yuan Gao, Je-Hyuk Lee, Emily M LeProust, In-Hyun Park, Bin Xie, George Q Daley & George M Church  
*Nat. Biotechnol.* 27, 361–368 (2009); published online 29 March 2009; corrected after print 8 May 2009

In the version of this article initially published, the second affiliation for Yuan Gao was omitted: Department of Computer Science, Virginia Commonwealth University, Richmond, Virginia, USA. The affiliation has been added to the HTML and PDF versions of the article.

## Erratum: Biotech patents—business as usual?

Stacy Lawrence  
*Nat. Biotechnol.* 26, 1326 (2008); published online 6 December 2008; corrected after print 8 May 2009

In the version of this article initially published, the Table listing the top 20 organizations with the most US biotech patents issued in 2007 is incorrect. Pioneer Hi-Bred should be listed in 3rd place, with 123 patents. The error has been corrected in the HTML and PDF versions of the article.

## Erratum: Proprietary science, open science and the role of patent disclosure: the case of zinc-finger proteins

Subhashini Chandrasekharan, Sapna Kumar, Cory M Valley & Arti Rai  
*Nat. Biotechnol.* 27, 140–144 (2009); published online 9 February 2009; corrected after print 9 February 2009

In the version of this article published in print, the second affiliation for Arti Rai was inadvertently inserted into the middle of the affiliation for Sapna Kumar. The two affiliations should have read as follows: “Arti Rai is also at Duke University School of Law, Durham, North Carolina 27708, USA; Sapna Kumar is at the Chambers of the Hon. Kenneth Ripple, US Court of Appeals for the Seventh Circuit, Chicago, Illinois 60604, USA;” The error has been corrected in the HTML and PDF versions of the article.

## Erratum: Biotech scientists bank on big pharma’s biologics push

Grace Wong  
*Nat. Biotechnol.* 27, 293–295 (2009); published online 7 March 2009; corrected after print 8 May 2009

In the version of this article initially published, Joe Jimenez’s title was listed as CEO of Novartis. He is CEO of the Novartis Pharmaceuticals division. The error has been corrected in the HTML and PDF versions of the article.

## Erratum: Identification of selective inhibitors of uncharacterized enzymes by high-throughput screening with fluorescent activity-based probes

Daniel A Bachovchin, Steven J Brown, Hugh Rosen & Benjamin F Cravatt  
*Nat. Biotechnol.* 27, 387–394 (2009); published online 29 March 2009; corrected after print 8 May 2009.

In the version of the article initially published, the IC<sub>50</sub> value of cephaeline is given as 2.7  $\mu$ M in Figure 3d. The correct value is 27  $\mu$ M. The error has been corrected in the HTML and PDF versions of the article.