Trends in biotech literature 2009–2010

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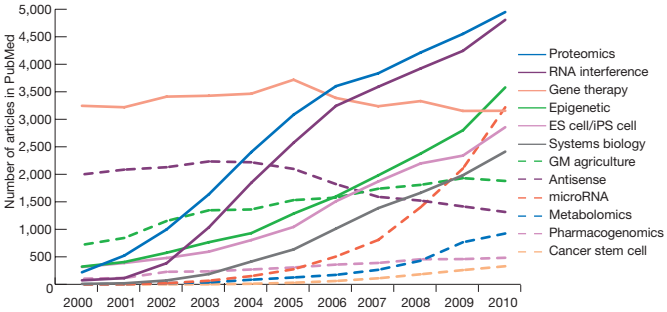
The emergence of large-scale, high-throughput technologies for analyzing epigenetic modifications and RNAs has fueled growth in these fields. Seminal publications appeared describing DNA nanotechnology, characterizing the gut microbiome and disclosing new platforms for DNA/RNA sequencing. China continues its march in terms of numbers of papers, but US institutions still accrue the most citations.

Historic trends in biotech fields

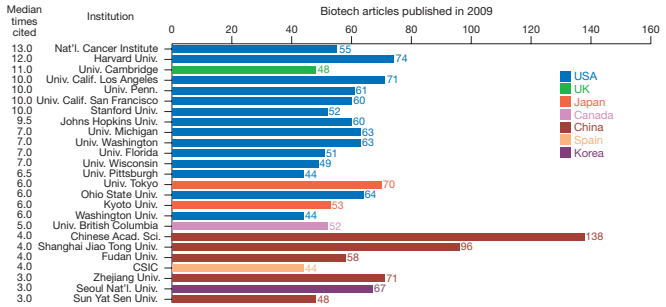
RNA interference (in particular microRNAs), proteomics, ES/iPS cell, epigenetics and systems biology continue rapid growth.



ES cell, embryonic stem cell; iPS cell, induced pluripotent stem cell.
Source: National Center for Biotechnology Information, PubMed.

Top 25 institutions publishing in biotech in 2009

Chinese institutions now account for 5 out of the top 25 in terms of publication volume, though papers from United States remain most cited.



Data obtained by searching 12 predefined 'biotechnology' fields in articles published in 2009.
Source: ISI-Thomson Reuters Web of Science.

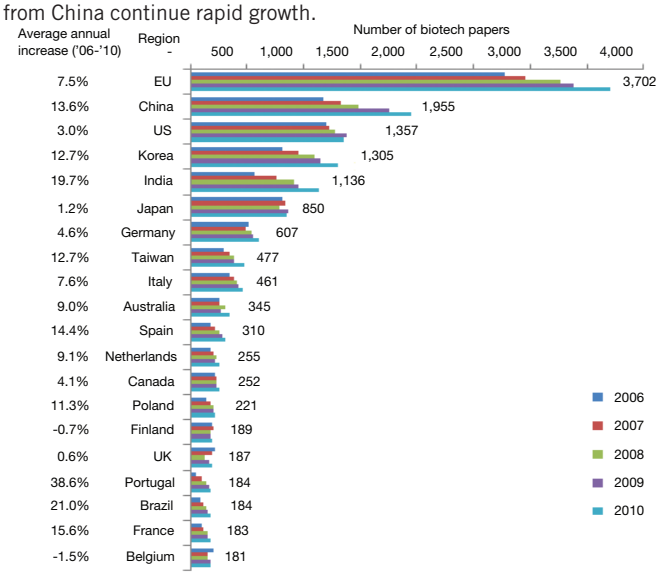
Biotech journal impact

Primary research journal	2009 Impact factor	Change from 2008
Nature Biotechnology	31.085	1.590
Cell Stem Cell	25.943	2.380
Nature Chemical Biology	17.927	1.869
Genome Research	13.588	2.246
PNAS	9.771	0.339
Molecular Systems Biology	9.677	–2.448
Molecular and Cellular Proteomics	8.354	–0.437
Stem Cells	7.871	0.124
Review journal	**2009 Impact factor**	**Change from 2008**
Nature Reviews Drug Discovery	28.712	–0.347
Annual Review of Pharmacology	19.238	–3.230
Pharmacological Reviews	18.861	1.861
Annual Review of Biomedical Engineering	11.000	–0.235
Trends in Biotechnology	9.644	2.735
Current Opinion in Biotechnology	8.486	0.666

Source: ISI-Thomson Reuters, Journal Citation Report.

Number of biotech articles published by region

Taiwan's output of biotech papers surpassed Italy's; articles originating from China continue rapid growth.



EU represents the aggregated number of all EU member countries.
Source: National Center for Biotechnology Information, PubMed.

Top cited papers published in 2009 by field

Field	Author	Title	Citation	Times cited
microRNA	Friedman, R.C. *et al.*	Most mammalian mRNAs are conserved targets of microRNAs.	*Genome Res.* **19**, 92–105 (2009)	384
Metagenomics	Turnbaugh, P.J. *et al.*	A core gut microbiome in obese and lean twins.	*Nature* **457**, 480–484 (2009)	357
Animal models	Paez-Ribes, M. *et al.*	Antiangiogenic therapy elicits malignant progression of tumors to increased local invasion and distant metastasis.	*Cancer Cell* **15**, 220–231 (2009)	353
iPSC/ESC	Yu, J. *et al.*	Human induced pluripotent stem cells free of vector and transgene sequences.	*Science* **324**, 797–801 (2009)	339
Epigenetics	Lister, R. *et al.*	Human DNA methylomes at base resolution show widespread epigenomic differences.	*Nature* **462**, 315–322 (2009)	330
Agricultural biotechnology	Paterson, A.H. *et al.*	The *Sorghum bicolor* genome and the diversification of grasses.	*Nature* **457**, 551–556 (2009)	259
Proteomics	Choudhary, C. *et al.*	Lysine acetylation targets protein complexes and co-regulates major cellular functions.	*Science* **325**, 834–840 (2009)	250
Sequencing	Eid, J. *et al.*	Real-time DNA sequencing from single polymerase molecules.	*Science* **323**, 133–138 (2009)	241
Metabolomics	Sreekumar, A. *et al.*	Metabolomic profiles delineate potential role for sarcosine in prostate cancer progression.	*Nature* **457**, 910–914 (2009)	229
Gene therapy	Kota, J. *et al.*	Therapeutic microRNA delivery suppresses tumorigenesis in a murine liver cancer model.	*Cell* **137**, 1005–1017 (2009)	185
Nanobiotechnology	Douglas, S.M. *et al.*	Self-assembly of DNA into nanoscale three-dimensional shapes.	*Nature* **459**, 414–418	144
Diagnostics	Park, J.H. *et al.*	Biodegradable luminescent porous silicon nanoparticles for *in vivo* applications.	*Nat. Mater.* **8**, 331–336 (2009)	125
Imaging	Lo Celso, C. *et al.*	Live-animal tracking of individual haematopoietic stem/progenitor cells in their niche.	*Nature* **457**, 92–96 (2009)	109
Synthetic biology	Tigges, M. *et al.*	A tunable synthetic mammalian oscillator.	*Nature* **457**, 309–312 (2009)	90

iPSC, induced pluripotent stem cell; ESC, embryonic stem cell.
Source: ISI-Thomson Reuters Web of Science. Citation data as of 8/10/10.

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