

# 化学生物学研究领域分析报告

2011 年 4 月 30 日

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## 一、Web of Science 数据来源、检索年限及检索策略

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Web of Science（全球获取学术信息的重要数据库）中的

1、Science Citation Index Expanded（SCIE，科学引文索引）

检索年限：1899-至今

2、Conference Proceedings Citation Index- Science（CPCI-S，会议论文集引文索引）

检索年限：2001-2010

3、主题=((bioanalysis) or ("single biomolecule") or ("chem\* bio\*") or ("fluo\* probe") or ("fluo\* sensor") or (chemosensor) or ("capillary electrophore\*") or ("bio\* mass"))

## 二、基于 Web of Science 数据库的趋势分析

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### 1、论文产出与增长趋势

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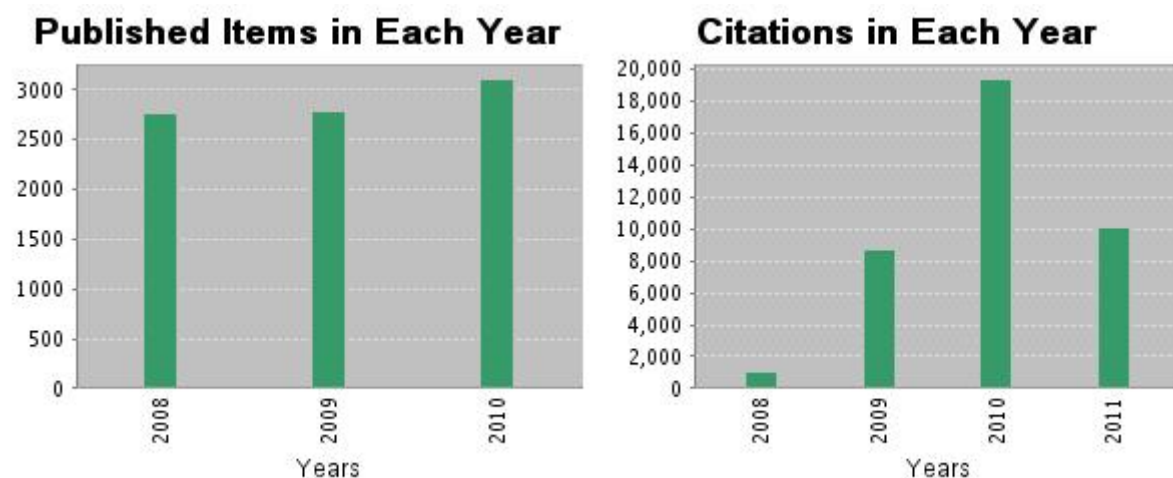
共发表论文 **30315** 篇，其中中国发表论文在该领域中共发表论文 **5617** 篇，可以清晰的看到国际和中国发表论文的发展趋势。

科技论文产出数量

| Publication Year | International Record Count | China Record Count |
|------------------|----------------------------|--------------------|
| 2001             | 2035                       | 208                |
| 2002             | 2205                       | 250                |
| 2003             | 2182                       | 285                |
| 2004             | 2362                       | 411                |
| 2005             | 2531                       | 538                |
| 2006             | 2593                       | 665                |
| 2007             | 2657                       | 639                |
| 2008             | 2760                       | 809                |
| 2009             | 2708                       | 849                |
| 2010             | 2871                       | 935                |

## 2、论文产出引文报告

由于论文数较多，仅选择了 2008-2010 年的 article 进行引文的分析，2008-2010 年总发文 (article) 为 8654 篇。



化学生物学领域近三年（2008-2010 年）期刊论文引文分析

| 分析项目    | 分析数值  |
|---------|-------|
| 论文总数    | 8654  |
| 总被引频次   | 39174 |
| 篇均引用次数  | 4.53  |
| h-index | 46    |

## 3、学科分布概况

10 个学科如下:

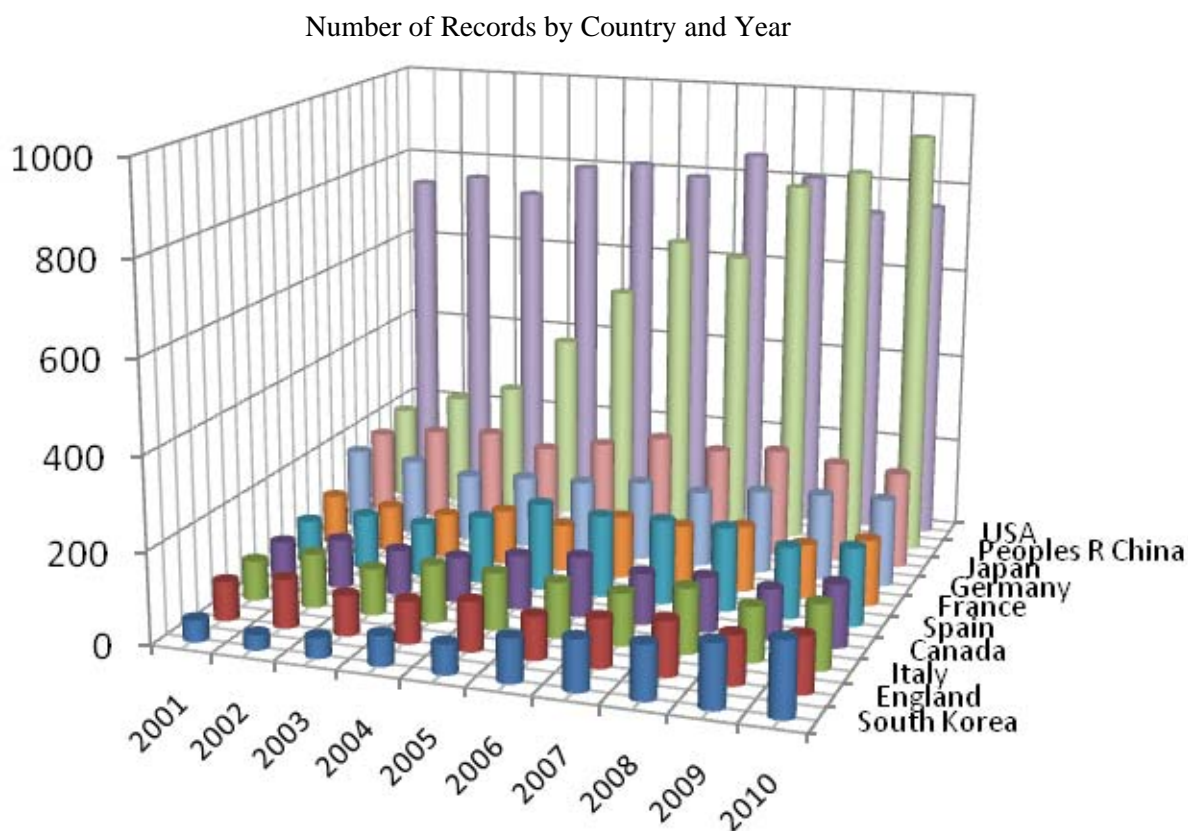
| Subject Area                     | Record Count |
|----------------------------------|--------------|
| Chemistry, Analytical            | 12570        |
| Biochemical Research Methods     | 7520         |
| Chemistry, Multidisciplinary     | 3509         |
| Biochemistry & Molecular Biology | 3129         |
| Pharmacology & Pharmacy          | 1697         |
| Chemistry, Organic               | 1354         |
| Chemistry, Physical              | 1312         |
| Food Science & Technology        | 838          |
| Biophysics                       | 827          |
| Nanoscience & Nanotechnology     | 806          |

#### 4、科研实力分析

前 10 个主要合作的国家和地区如下：

| Country/Territory | Record Count |
|-------------------|--------------|
| USA               | 7774         |
| Peoples R China   | 5589         |
| Japan             | 2145         |
| Germany           | 1725         |
| Spain             | 1543         |
| France            | 1213         |
| Italy             | 1187         |
| Canada            | 1119         |
| England           | 1023         |
| South Korea       | 877          |

前 10 个国家和地区年度发文比较如下：



主要科研国家与地区及其年代变化趋势

前 10 个主要合作的国际机构如下:

---

| <b>Institution Name</b> | <b>Record Count</b> |
|-------------------------|---------------------|
| Chinese Acad Sci        | 1049                |
| CNR                     | 310                 |
| Wuhan Univ              | 294                 |
| Univ Tokyo              | 262                 |
| Univ Texas              | 254                 |
| Univ Sao Paulo          | 242                 |
| Zhejiang Univ           | 232                 |
| CSIC                    | 220                 |
| Nanjing Univ            | 195                 |
| Univ Vienna             | 195                 |

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## Organization Trends in Last 3 Years

| <u>Top Organizations in Last 3 Years</u> | <u>Organizations First Published in Last 3 Years</u> | <u>Organizations No Longer Published in Last 3 Years</u> |
|--|--|--|
| Chinese Acad Sci [423]                   | Univ Texas Austin [16]                               | Charles Univ [96]  |
| Wuhan Univ [115]                         | Islamic Azad Univ [15]                               | Himeji Inst Technol [43]                                 |
| Nanjing Univ [90]                        | Xi An Jiao Tong Univ [14]                            | Free Univ Amsterdam [24]                                 |
| Univ Tokyo [89]                          | Bilkent Univ [12]                                    | GSF [21]   |
| CNR [88]                                 | Univ Toulouse [12]                                   | Univ Basilicata [19]                                     |
| Univ Sao Paulo [82]                      | Natl Inst Nat Sci [11]                               | Zhongshan Univ [19]                                      |
| Zhejiang Univ [82]                       | Shaheed Beheshti Univ [10]                           | Univ Mainz [18]  |
| Dalian Univ Technol [76]                 | Fujian Agr & Forestry Univ [9]                       | Tallinn Tech Univ [18]                                   |
| Fudan Univ [75]                          | Natl Inst Biomed Imaging & Bioengn [9]               | Univ Naples Federico II [18]                             |
| Nankai Univ [75]                         | Rhein Freidrich Wilhelms Univ Bonn [9]               | Torrey Mesa Res Inst [17]                                |
| Peking Univ [75]                         | Tech Univ Dortmund [9]                               | Univ San Pablo [16]                                      |
| Hunan Univ [75]                          | Ain Shams Univ [8]                                   | Danish Univ Pharmaceut Sci [15]                          |
| Russian Acad Sci [69]                    | Ghent Univ Hosp [8]                                  | Kanagawa Acad Sci & Technol [15]                         |
| Harvard Univ [65]                        | Sojo Univ [8]  | Univ Agr [15]  |
| E China Univ Sci & Technol [65]          | Algorithme Pharma Inc [8]                            | SE Oklahoma State Univ [14]                              |
| Lanzhou Univ [65]                        | Rural Dev Adm [7]                                    | GKSS Forschungszentrum Geesthacht GmbH [13]              |
| CSIC [64]                                | Huaibei Coal Ind Teachers Coll [7]                   | Royal Danish Sch Pharm [13]                              |
| Natl Taiwan Univ [63]                    | Aalen Univ [7]                                       | SW Normal Univ [13]                                      |
| Indian Inst Technol [62]                 | Karadeniz Tech Univ [7]                              | Chalmers Univ Technol [13]                               |
| Univ Calif Berkeley [61]                 | Univ Texas SW Med Ctr Dallas [7]                     | Mayo Clin & Mayo Fdn [12]                                |
| E China Normal Univ [60]                 | BAM Fed Inst Mat Res & Testing [7]                   | Royal Vet & Agr Univ [12]                                |
| Tsinghua Univ [59]                       | Wenzhou Univ [7]                                     | Univ Louis Pasteur Strasbourg 1 [11]                     |
| Sichuan Univ [57]                        | Hebei Univ Technol [6]                               | Huddinge Univ Hosp [11]                                  |
| Fuzhou Univ [55]                         | Porto Conte Ric Srl [6]                              | Natl Inst Hydrol [10]                                    |
| Natl Sun Yat Sen Univ [55]               | Bohai Univ [6]                                       | GeoCenters Inc [10]                                      |
| Univ Illinois [55]                       | Taishan Univ [6]                                     | Caliper Technol Corp [10]                                |
| Natl Univ Singapore [54]                 | Univ Alexandria [6]                                  | Aventis Pharma [10]                                      |
| Univ Washington [54]                     | Univ Khartoum [6]                                    | Wroclaw Tech Univ [10]                                   |
| Ewha Womans Univ [53]                    | Univ Lille Nord France [6]                           | Univ Opole [9]   |
| Univ N Carolina [52]                     | Jiangsu Polytech Univ [6]                            | Hitachi Ltd [9]  |
| Kyoto Univ [52]                          | Univ Med Ctr Hamburg Eppendorf [6]                   | Rostov State Univ [9]                                    |

|                                      |   |  |
|--------------------------------------|---|--|
| Charles Univ Prague [51]             | Jubilant Innovat [6]                          | Ctr Cellular & Mol Biol [9]              |
| Korea Univ [50]                      | Winston Salem State Univ [6]                  | UMIST [9]                                |
| Natl Inst Adv Ind Sci & Technol [49] | Lappeenranta Univ Technol [6]                 | Dionex Chem Corp [9]                     |
| Osaka Univ [49]                      | Ernst Moritz Arndt Univ Greifswald [6]        | Dupont Merck Pharmaceut Co [9]           |
| MIT [48]                             | Max Planck Gesell [5]                         | Univ Sacred Heart [9]                    |
| Univ Vienna [48]                     | China Three Gorges Univ [5]                   | MDS Pharma Serv [8]                      |
| Acad Sci Czech Republ [47]           | Chinese Acad Inspect & Quarantine [5]         | Res Ctr Julich [8]                       |
| Beijing Inst Technol [46]            | Beijing Natl Lab Mol Sci [5]                  | Boston Biomed Res Inst [8]               |
| RIKEN [46]                           | Nanjing Xiaozhuang Coll [5]                   | Inst Chem Engr & High Temp Chem Proc [8] |
| Seoul Natl Univ [45]                 | Natl Agr Res Ctr Hokkaido Reg [5]             | Tanabe Seiyaku Co Ltd [8]                |
| Shanghai Jiao Tong Univ [45]         | NUPT [5]                                      | CE Resources Pte Ltd [8]                 |
| Univ Bologna [45]                    | Politehn Univ Timisoara [5]                   | ACLARA BioSci Inc [8]                    |
| Hong Kong Baptist Univ [44]          | Selcuk Univ [5]                               | Univ Otago [8]                           |
| Stanford Univ [44]                   | Shaoguan Univ [5]                             | Univ Sevilla [8]                         |
| Univ Wisconsin [44]                  | Thompson Rivers Univ [5]                      | Univ Tuscia [8]                          |
| Univ Florida [43]                    | Natl Inst Hlth & Welf [5]                     | Univ Veszprem [8]                        |
| Univ Calif Los Angeles [43]          | JNTU Coll Engr [5]                            | Bayer AG [7]                             |
| Univ Barcelona [42]                  | Univ Podlasie [5]                             | Childrens Canc Res Inst [7]              |
| Univ Copenhagen [42]                 | Univ Reg Blumenau [5]                         | Montana State Univ [7]                   |
| Ecole Polytech Fed Lausanne [41]     | Univ So Mississippi [5]                       | Ft Lewis Coll [7]                        |
| Xiamen Univ [41]                     | Xuzhou Haotong New Mat Sci & Stock Co Ltd [5] | Natl Tech Univ Athens [7]                |
| Univ Granada [40]                    | Anapharm [5]                                  | Pharmacia Corp [7]                       |
| China Pharmaceut Univ [39]           | Mendeleev Univ Chem Technol [4]               | Sanofi Synthelabo Rech [7]               |
| Univ Minnesota [39]                  | Missouri Univ Sci & Technol [4]               | Shanghai Inst Drug Control [7]           |
| Univ Tasmania [39]                   | CHU [4]                                       | Silla Univ [7]                           |
| Jilin Univ [38]                      | Natl Chem Lab [4]                             | So Yangze Univ [7]                       |
| Shandong Univ [37]                   | Natl Inst Radiol Sci [4]                      | SpectruMedix [7]                         |
| Univ Cordoba [37]                    | Ochanomizu Univ [4]                           | Inje Univ [7]                            |
| Yonsei Univ [37]                     | Akdeniz Univ [4]                              | Def Res Estab Suffield [7]               |
| Huazhong Univ Sci & Technol [36]     | Consejo Super Invest Cient [4]                | Japan Adv Inst Sci & Technol [7]         |
| Univ Alberta [36]                    | Creighton Univ [4]                            | Univ Linz [7]                            |
| Univ Michigan [36]                   | Hlth Protect Agcy [4]                         | Duquesne Univ [7]                        |
| Univ Basel [35]                      | Rajamangala Univ Technol Krungthep [4]        | Kangweon Natl Univ [7]                   |
| Univ Toronto [35]                    | Huangshan Coll [4]                            | Univ Rostock [7]                         |



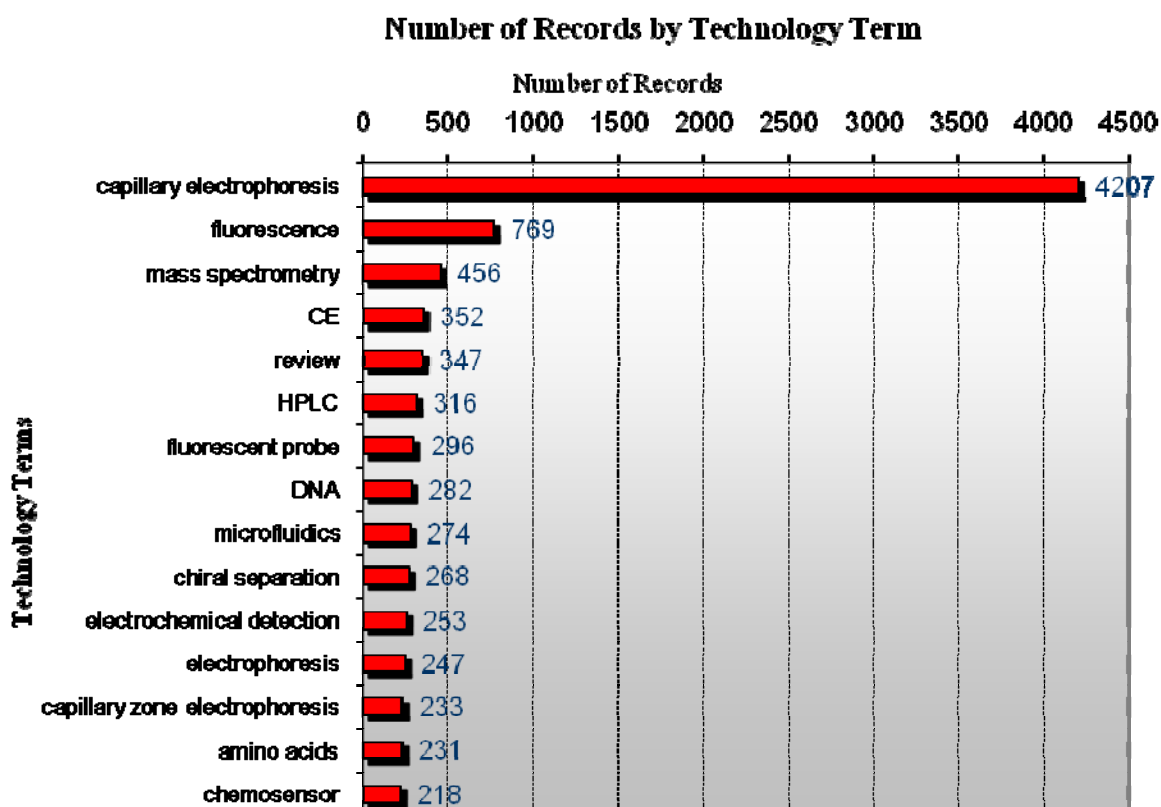
|                           |   |                                |
|---------------------------|---|--------------------------------|
| Univ Utrecht [35]         | Hubei Univ Educ [4]                       | Vienna Tech Univ [7]           |
| Natl Res Ctr [33]         | Acad Romana [4]                           | VTT Proc [7]                   |
| Nanyang Technol Univ [32] | Swiss Trop Inst [4]                       | Whitehead Inst Biomed Res [7]  |
| Shanxi Univ [32]          | Texas A&M Hlth Sci Ctr [4]                | Wright State Univ [7]          |
| Univ Texas [32]           | TU Dortmund [4]                           | Fed Inst Mat Res & Testing [6] |
| Univ Calif Davis [32]     | Inst Phys [4]                             | Micralyne Inc [6]              |
| Univ Valencia [32]        | Cardinal Stefan Wyszynski Univ Warsaw [4] | Fuji Elect Syst Co Ltd [6]     |
| Beijing Normal Univ [31]  | Univ Autonoma Estado Hidalgo [4]          | Furuno Elect Co Ltd [6]        |
| Dublin City Univ [31]     | Univ Beira Interior [4]                   | Natl Nano Device Lab [6]       |

前十位中国机构如下:

| Institution Name    | Record Count |
|---------------------|--------------|
| Chinese Acad Sci    | 1049         |
| Wuhan Univ          | 294          |
| Zhejiang Univ       | 232          |
| Nanjing Univ        | 195          |
| Peking Univ         | 177          |
| Fudan Univ          | 176          |
| Lanzhou Univ        | 173          |
| E China Normal Univ | 161          |
| Shandong Univ       | 150          |
| Nankai Univ         | 148          |

## 5、技术术语分析

通过对研究 30315 篇科技论文中的技术术语进行分析, 可以对研究领域出现的高频词分布有一个大致的了解。



## **Technology Trends in Last 3 Years**

Last 3 Years is: 2010 – 2008

| <b><u>Terms First Used in Last 3 Years</u></b> | <b><u>Terms No Longer Published in Last 3 Years</u></b> | <b><u>Unexpectedly high/low terms</u></b> |
|--|---|---|
| Melamine [13]                                  | background electrolyte composition [33]                 | miniaturization [-1]                      |
| ESIPT [10]                                     | buffer composition [32]                                 | microchip [-1]                            |
| oversulfated chondroitin sulfate [8]           | enantiomer separations [20]                             | proteins [-1]                             |
| Hemoglobinopathy [6]                           | positional isomers [17]                                 | cyclodextrins [-1]                        |
| hollow fiber [6]                               | capillary array electrophoresis [15]                    | peptides [-1]                             |
| Bioorganometallic chemistry [6]                | lactic acid [14]  | enantiomer separation [-1]                |
| Mercury detection [6]                          | striatum [12]   | click chemistry [1]                       |
| Monomer [6]                                    | carbamazepine [11]                                      | CE-SSCP [1]                               |
| silver [5]                                     | fatty acid [11]   | charge transfer [1]                       |
| HMW-GS [5]                                     | diastereomer separation [10]                            | mercury ion [1]                           |
| copolymerization [5]                           | capillary liquid chromatography [10]                    | nanomaterials [1]                         |
| Coronary artery disease [5]                    | enantioresolution [10]                                  | ruthenium [1]                             |
| impedance spectroscopy [5]                     | Schiff base [1]   | Melamine [1]                              |
| two-photon fluorescent probe [5]               | excitatory amino acids [10]                             | DFT [1]                                   |
| cytokine and chemokine biology [5]             | plant materials [10]                                    | ESIPT [1]                                 |
| kinase [5]                                     | sample handling [9]                                     | background electrolyte composition [-1]   |
| Amyloid fibril [5]                             | mu TAS [9]  | buffer composition [-1]                   |
| LC-ESI-MS/MS [5]                               | aerosol [9]   | chiral separation [-.999]                 |
| dispersive liquid-liquid microextraction [5]   | erythrocytes [9]  | electrochemical detection [-.999]         |
| Mesoporous materials [5]                       | excimer emission [9]                                    | review [-.999]                            |
| anthocyanins [5]                               | oxidative damage [9]                                    | derivatization [-.999]                    |
| microchannel flow [5]                          | chemokine [9]   | fluorescent [.999]                        |
| microfluidic chip electrophoresis [5]          | prion [9]   | probe [.999]                              |
| microparticles [5]                             | solvation [8]   | aptamers [.999]                           |
| dyes/pigments [5]                              | sulfated cyclodextrin [8]                               | energy transfer [.999]                    |
| molecular biophysics [5]                       | sulfated cyclodextrins [8]                              | molecular imaging [.999]                  |
| permanent pasture [5]                          | creatine [8]  | screening [.999]                          |
| Charged aerosol detection [5]                  | triazines [8]   | dermatan sulfate [.999]                   |
| fragmentation [5]                              | cyanide [.999]  | molecularly imprinted polymer [.999]      |
| functional composition [5]                     | enantioanalysis [8]                                     |   |
| chronic kidney disease [5]                     | environmental waters [8]                                |   |

|                                    |  |  |
|------------------------------------|--|--|
| RNA quality [5]                    | estradiol [8]                                | capacitively coupled contactless conductivity detection [.999] |
| Click reaction [4]                 | atmospheric pressure chemical ionization [8] | Cu <sup>2+</sup> [.999]  |
| SBA-15 [4]                         | 8-hydroxy-2'-deoxyguanosine [8]              | Hg <sup>2+</sup> [.999]  |
| selective [4]                      | fluorimetric detection [8]                   | integration [.999]   |
| Hemoglobin A(2 [4]                 | post-translational modifications [8]         | conjugated polymer [.999]                                      |
| sickle cell disease [4]            | protein kinase C [8]                         | copper ion [.999]  |
| Hg(II [4]                          | hair analysis [7]                            | MCE [.999]   |
| silver nanoparticle [4]            | heptakis(2 [7]                               | CIEF [.999]  |
| simultaneous enantioseparation [4] | high frequency conductivity detection [7]    | colorimetric sensor [.999]                                     |
| Single drop microextraction [4]    | superoxide anion [7]                         | liquid phase microextraction [.999]                            |
| 4-Chloro-3 [4]                     | tartaric acid [7]                            | oversulfated chondroitin sulfate [.999]                        |
| beta-cyclodextrin derivatives [4]  | immunotherapy [7]                            | reviews [-.999]  |

## 6、作者概况

国际前十位作者:

| Author                | Record Count |
|-----------------------|--------------|
| Kim, Jong Seung       | 52           |
| Yoon, Juyoung         | 48           |
| Mischak, Harald       | 39           |
| Hauser, Peter C       | 38           |
| Aboul-Enein, Hassan Y | 34           |
| Mathies, Richard A    | 31           |
| Cifuentes, Alejandro  | 30           |
| Somsen, Govert W      | 30           |
| de Jong, Gerhardus J  | 29           |
| Breadmore, Michael C  | 27           |

中国发文前十位的作者分析结果显示如下:

| Author        | Record Count |
|---------------|--------------|
| Chen, Guonan  | 51           |
| Wang, Erkang  | 40           |
| Wang, Wei     | 38           |
| Chen, Gang    | 37           |
| Qian, Xuhong  | 27           |
| Yu, Ru-Qin    | 26           |
| Peng, Xiaojun | 26           |
| Zhao, Shulin  | 25           |
| Wang, Hong    | 25           |
| Lin, Jin-Ming | 25           |

### 化学所的 10 篇论文目录 (总 195 篇) :

1. 标题: Optical detection of mercury(II) in aqueous solutions by using conjugated polymers and label-free oligonucleotides  
作者: Liu XF, Tang YL, Wang LH, et al.  
来源出版物: **ADVANCED MATERIALS** 卷: 19 期: 11 页: 1471-+ 出版年: JUN 4 2007  
被引频次: 94
2. 标题: Aptamer-based ATP assay using a luminescent light switching complex  
作者: Wang J, Jiang YX, Zhou CS, et al.  
来源出版物: **ANALYTICAL CHEMISTRY** 卷: 77 期: 11 页: 3542-3546 出版年: JUN 1 2005  
被引频次: 82
3. 标题: Rhodamine B thiolactone: a simple **chemosensor** for Hg<sup>2+</sup> in aqueous media  
作者: Shi W, Ma HM  
来源出版物: **CHEMICAL COMMUNICATIONS** 期: 16 页: 1856-1858 出版年: APR 28 2008  
被引频次: 66
4. 标题: Fingerprinting of *Salvia miltiorrhiza* Bunge by non-aqueous **capillary electrophoresis** compared with high-speed counter-current chromatography  
作者: Gu M, Zhang SF, Su ZG, et al.  
来源出版物: **JOURNAL OF CHROMATOGRAPHY A** 卷: 1057 期: 1-2 页: 133-140 出版年: NOV 19 2004  
被引频次: 50
5. 标题: A water-soluble, small molecular **fluorescent sensor** with femtomolar sensitivity for zinc ion  
作者: Wang HH, Gan Q, Wang XJ, et al.  
来源出版物: **ORGANIC LETTERS** 卷: 9 期: 24 页: 4995-4998 出版年: NOV 22 2007  
被引频次: 37
6. 标题: A tetra-sulfonamide derivative bearing two dansyl groups designed as a new fluoride selective fluorescent **chemosensor**  
作者: Chen CF, Chen QY  
来源出版物: **TETRAHEDRON LETTERS** 卷: 45 期: 20 页: 3957-3960 出版年: MAY 10 2004  
被引频次: 30
7. 标题: Vesicles with superior stability at high temperature  
作者: Yan Y, Huang JB, Li ZC, et al.  
来源出版物: **JOURNAL OF PHYSICAL CHEMISTRY B** 卷: 107 期: 7 页: 1479-1482 出版年: FEB 20 2003  
被引频次: 25
8. 标题: High sensitive determination of DNA by use of molecular "light switch" complex of Ru(phen)<sub>2</sub>(dppx)<sub>2</sub><sup>2+</sup>  
作者: Ling LS, He ZK, Song GW, et al.  
来源出版物: **ANALYTICA CHIMICA ACTA** 卷: 436 期: 2 页: 207-214 出版年: JUN 12 2001  
被引频次: 25

9. 标题: A Fluorescence Turn-on Detection of Cyanide in Aqueous Solution Based on the Aggregation-Induced Emission

作者: Peng LH, Wang M, Zhang GX, et al.

来源出版物: **ORGANIC LETTERS** 卷: 11 期: 9 页: 1943-1946 出版年: MAY 7 2009

被引频次: 24

10. 标题: A highly selective and sensitive fluorescence probe for the hypochlorite anion

作者: Chen XQ, Wang XC, Wang SJ, et al.

来源出版物: **CHEMISTRY-A EUROPEAN JOURNAL** 卷: 14 期: 15 页: 4719-4724 出版年: 2008

被引频次: 24

## 三、基于 Web of Science 数据库的文献调研

### 1、高被引综述

据 Web of Science 数据库统计结果显示: 研究领域的综述论文共有 2449 篇, 以下列出了前 10 位的高被引综述。

1. 标题: Micro total analysis systems. 1. Introduction, theory, and technology  
作者: Reyes DR, Iossifidis D, Auroux PA, et al.  
来源出版物: **ANALYTICAL CHEMISTRY** 卷: 74 期: 12 页: 2623-2636 出版年: JUN 15 2002  
被引频次: 1,195
2. 标题: Micro total analysis systems. 2. Analytical standard operations and applications  
作者: Auroux PA, Iossifidis D, Reyes DR, et al.  
来源出版物: **ANALYTICAL CHEMISTRY** 卷: 74 期: 12 页: 2637-2652 出版年: JUN 15 2002  
被引频次: 996
3. 标题: Taking advantage of luminescent lanthanide ions  
作者: Bunzli JCG, Piguet C  
来源出版物: **CHEMICAL SOCIETY REVIEWS** 卷: 34 期: 12 页: 1048-1077 出版年: 2005  
被引频次: 632
4. 标题: Poly(dimethylsiloxane) as a material for fabricating microfluidic devices  
作者: McDonald JC, Whitesides GM  
来源出版物: **ACCOUNTS OF CHEMICAL RESEARCH** 卷: 35 期: 7 页: 491-499 出版年: JUL 2002  
被引频次: 612
5. 标题: Micro total analysis systems. Recent developments  
作者: Vilckner T, Janasek D, Manz A  
来源出版物: **ANALYTICAL CHEMISTRY** 卷: 76 期: 12 页: 3373-3385 出版年: JUN 15 2004  
被引频次: 588
6. 标题: Analysis of proteins and proteomes by mass spectrometry  
作者: Mann M, Hendrickson RC, Pandey A  
来源出版物: **ANNUAL REVIEW OF BIOCHEMISTRY** 卷: 70 页: 437-473 出版年: 2001  
被引频次: 536
7. 标题: Microfluidic devices fabricated in poly(dimethylsiloxane) for biological studies  
作者: Sia SK, Whitesides GM  
来源出版物: **ELECTROPHORESIS** 卷: 24 期: 21 页: 3563-3576 出版年: NOV 2003  
被引频次: 493
8. 标题: Physics and applications of microfluidics in biology  
作者: Beebe DJ, Mensing GA, Walker GM  
来源出版物: **ANNUAL REVIEW OF BIOMEDICAL ENGINEERING** 卷: 4 页: 261-286 出版年: 2002  
被引频次: 466
9. 标题: Measuring reactive species and oxidative damage in vivo and in cell culture: how should you do it and what do the results mean?  
作者: Halliwell B, Whiteman M  
来源出版物: **BRITISH JOURNAL OF PHARMACOLOGY** 卷: 142 期: 2 页: 231-255 出版年: MAY 2004

被引频次: 433

10. 标题: Quantum dots as cellular probes

作者: Alivisatos AP, Gu WW, Larabell C

来源出版物: ANNUAL REVIEW OF BIOMEDICAL ENGINEERING 卷: 7 页: 55-76 出版年: 2005

被引频次: 431

## 2、高被引论文

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Web of Science 数据库有关研究方向的研究论文有 23462 篇, 研究领域中被引用次数最高的前 10 篇论文为:

1. 标题: Genome sequencing in microfabricated high-density picolitre reactors  
作者: Margulies M, Egholm M, Altman WE, et al.  
来源出版物: NATURE 卷: 437 期: 7057 页: 376-380 出版年: SEP 15 2005  
被引频次: 1,704
2. 标题: Structural diversity in binary nanoparticle superlattices  
作者: Shevchenko EV, Talapin DV, Kotov NA, et al.  
来源出版物: NATURE 卷: 439 期: 7072 页: 55-59 出版年: JAN 5 2006  
被引频次: 529
3. 标题: Aurora B couples chromosome alignment with anaphase by targeting BubR1, Mad2, and Cenp-E to kinetochores  
作者: Ditchfield C, Johnson VL, Tighe A, et al.  
来源出版物: JOURNAL OF CELL BIOLOGY 卷: 161 期: 2 页: 267-280 出版年: APR 28 2003  
被引频次: 521
4. 标题: The small molecule Hesperadin reveals a role for Aurora B in correcting kinetochore-microtubule attachment and in maintaining the spindle assembly checkpoint  
作者: Hauf S, Cole RW, LaTerra S, et al.  
来源出版物: JOURNAL OF CELL BIOLOGY 卷: 161 期: 2 页: 281-294 出版年: APR 28 2003  
被引频次: 500
5. 标题: Loss of acetylation at Lys16 and trimethylation at Lys20 of histone H4 is a common hallmark of human cancer  
作者: Fraga MF, Ballestar E, Villar-Garea A, et al.  
来源出版物: NATURE GENETICS 卷: 37 期: 4 页: 391-400 出版年: APR 2005  
被引频次: 450
6. 标题: The complete genome of an individual by massively parallel DNA sequencing  
作者: Wheeler DA, Srinivasan M, Egholm M, et al.  
来源出版物: NATURE 卷: 452 期: 7189 页: 872-U5 出版年: APR 17 2008  
被引频次: 439
7. 标题: Development and validation of an improved oxygen radical absorbance capacity assay using fluorescein as the fluorescent probe  
作者: Ou BX, Hampsch-Woodill M, Prior RL  
来源出版物: JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY 卷: 49 期: 10 页: 4619-4626 出版年: OCT 2001  
被引频次: 418
8. 标题: Lipophilic and hydrophilic antioxidant capacities of common foods in the United States  
作者: Wu XL, Beecher GR, Holden JM, et al.  
来源出版物: JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY 卷: 52 期: 12 页: 4026-4037 出版年: JUN 16 2004  
被引频次: 399
9. 标题: Determination of organic compounds in water using dispersive liquid-liquid microextraction  
作者: Rezaee M, Assadi Y, Hosseini MRM, et al.  
来源出版物: JOURNAL OF CHROMATOGRAPHY A 卷: 1116 期: 1-2 页: 1-9 出版年: MAY 26 2006  
被引频次: 338

10. 标题: Extraordinary mobility in semiconducting carbon nanotubes  
 作者: Durkop T, Getty SA, Cobas E, et al.  
 来源出版物: **NANO LETTERS** 卷: 4 期: 1 页: 35-39 出版年: JAN 2004  
 被引频次: 337

### 3、会议论文

研究领域上发表会议论文数量前 10 个的会议为:

| 会议名称   | 论文数 |
|--|-----|
| 16th International Symposium on Microscale Separation and Analysis   | 67  |
| 14th International Symposium on Microscale Separations and Analysis  | 33  |
| 15th international Symposium on Microscale Separations and Analysis (HPCE 2002)                              | 29  |
| 17th International Symposium on Microscale Separations and Capillary Electrophoresis (HPCE 2004)             | 26  |
| 3rd International Symposium on Capillary Electrophoresis and Related Microscale Techniques (APCE 2000)       | 25  |
| ASME International Mechanical Engineering Congress and Exposition  | 22  |
| 14th International Symposium on Capillary Electroseparation Techniques                                       | 20  |
| 26th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2002) | 20  |
| 20th Symposium on Capillary Electrophoresis (SCE 2000)   | 17  |
| 12th International Symposium on Capillary Electroseparation Techniques                                       | 16  |

其中高被引用次数前 10 位的会议论文为(总 3004 篇):

- 标题: From bench to bedside - preclinical and early clinical development of the anticancer agent indazolium trans-[tetrachlorobis(1H-indazole)ruthenate(III)] (KP1019 or FFC14A)  
 作者: Hartinger CG, Zorbass-Seifried S, Jakupcic MA, et al.  
 会议信息: 12th International Conference on Biological Inorganic Chemistry, JUL 31-AUG 05, 2005 Ann Arbor, MI  
 来源出版物: **JOURNAL OF INORGANIC BIOCHEMISTRY** 卷: 100 期: 5-6 页: 891-904 出版年: MAY 2006  
 被引频次: 213
- 标题: Reactive nitrogen species in the [chemical biology](#) of inflammation  
 作者: Dedon PC, Tannenbaum SR  
 会议信息: Annual Meeting of the Oxygen Club of California (OCC), MAR 10-13, 2004 SANTA BARBARA, CALIFORNIA  
 来源出版物: **ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS** 卷: 423 期: 1 页: 12-22 出版年: MAR 1 2004  
 被引频次: 199
- 标题: QM/MM: what have we learned, where are we, and where do we go from here?  
 作者: Lin H, Truhlar DG  
 会议信息: 10th Electronic Computational Chemistry Conference, APR, 2005 West Long Branch, NJ  
 来源出版物: **THEORETICAL CHEMISTRY ACCOUNTS** 卷: 117 期: 2 页: 185-199 出版年: FEB 2007  
 被引频次: 176
- 标题: Review of physics and applications of relativistic plasmas driven by ultra-intense lasers  
 作者: Umstadter D  
 会议信息: 42nd Annual Meeting of the Division of Plasma Physics Of the American-Physical-Society/10th International Congress on Plasma Physics, OCT 23-27, 2000 QUEBEC CITY, CANADA  
 来源出版物: **PHYSICS OF PLASMAS** 卷: 8 期: 5 页: 1774-1785 子辑: Part 2 出版年: MAY 2001  
 被引频次: 174



- 5. 标题:** Effects and fate of tannins in ruminant animals, adaptation to tannins, and strategies to overcome detrimental effects of feeding tannin-rich feeds  
**作者:** Makkar HPS  
**会议信息:** Seminar on Nutrition and feeding Strategies of Small Ruminants Under Harsh Climates, NOV 08-10, 2001 HAMMAMET, TUNISIA  
**来源出版物:** **SMALL RUMINANT RESEARCH** 卷: **49** 期: **3** 页: **241-256** 出版年: **SEP 2003**  
**被引频次:** **162**
- 6. 标题:** Microchannel wall coatings for protein separations by capillary and chip electrophoresis  
**作者:** Doherty EAS, Meagher RJ, Albarghouthi MN, et al.  
**会议信息:** 16th International Symposium on Microscale Separation and Analysis, JAN 17-22, 2003 SAN DIEGO, CALIFORNIA  
**来源出版物:** **ELECTROPHORESIS** 卷: **24** 期: **1-2** 页: **34-54** 出版年: **JAN 2003**  
**被引频次:** **159**
- 7. 标题:** Sweeping: concentration mechanism and applications to high-sensitivity analysis in [capillary electrophoresis](#)  
**作者:** Quirino JP, Kim JB, Terabe S  
**会议信息:** Symposium on Application of Theory to the Practice and Understanding of Chromatography, JUN 13-15, 2001 ELLECOM, NETHERLANDS  
**来源出版物:** **JOURNAL OF CHROMATOGRAPHY A** 卷: **965** 期: **1-2** 页: **357-373** 出版年: **AUG 2 2002**  
**被引频次:** **134**
- 8. 标题:** Tumor targeting using anti-her2 immunoliposomes  
**作者:** Park JW, Kirpotin DB, Hong K, et al.  
**会议信息:** International Symposium on Tumor Targeted Delivery Systems, SEP 25-27, 2000 BETHESDA, MARYLAND  
**来源出版物:** **JOURNAL OF CONTROLLED RELEASE** 卷: **74** 期: **1-3** 页: **95-113** 出版年: **JUL 6 2001**  
**被引频次:** **130**
- 9. 标题:** Prospects of conducting polymers in molecular electronics  
**作者:** Saxena V, Malhotra BD  
**会议信息:** India/Japan Workshop on New Advanced Materials in Molecular Electronics, DEC 10-11, 2001 NEW DELHI, INDIA  
**来源出版物:** **CURRENT APPLIED PHYSICS** 卷: **3** 期: **2-3** 页: **293-305** 出版年: **APR 2003**  
**被引频次:** **113**
- 10. 标题:** Recent developments in the coupling of photoassisted and aerobic biological processes for the treatment of biorecalcitrant compounds  
**作者:** Sarria V, Parra S, Adler N, et al.  
**会议信息:** Ibero-American Workshop on Photocatalysis, JUN, 2002 SEVILLE, SPAIN  
**来源出版物:** **CATALYSIS TODAY** 卷: **76** 期: **2-4** 页: **301-315** 出版年: **NOV 15 2002**  
**被引频次:** **111**

#### 4、期刊分布

发表论文数量排在前 10 位的期刊为:

| 期刊名称                   | 论文数  |
|------------------------|------|
| Electrophoresis        | 2374 |
| J. Chromatogr. A       | 1623 |
| Anal. Chem             | 1195 |
| Anal. Chim. Acta       | 665  |
| J. Chromatogr. B       | 611  |
| J. Sep. Sci            | 531  |
| J. Pharm. Biomed. Anal | 512  |
| Talanta                | 511  |
| Anal. Bioanal. Chem    | 496  |
| Chromatographia        | 396  |

## 5、基金资助

排在前 10 位的基金资助机构为：

| 基金资助机构  | 论文数 |
|---|-----|
| National Natural Science Foundation of China (NSFC) | 831 |
| National Institutes of Health                       | 216 |
| NIH   | 166 |
| National Science Foundation                         | 165 |
| National Basic Research Program of China            | 145 |
| NSFC  | 126 |
| Chinese Academy of Sciences                         | 105 |
| National Science Foundation of China                | 82  |
| NSF   | 66  |
| Natural Science Foundation of China                 | 56  |

由国家自然科学基金资助的发表研究论文前 10 位的机构为：

| 基金资助的机构          | 论文数 |
|------------------|-----|
| Chinese Acad Sci | 169 |
| Nanjing Univ     | 41  |
| Wuhan Univ       | 41  |
| Nankai Univ      | 35  |
| Hunan Univ       | 31  |
| Peking Univ      | 27  |
| Tsinghua Univ    | 27  |
| Fuzhou Univ      | 26  |
| Fudan Univ       | 24  |
| Sichuan Univ     | 24  |

## 四、化学所及国内外机构比较分析（趋势分析及文献调研中涉及的分析项）

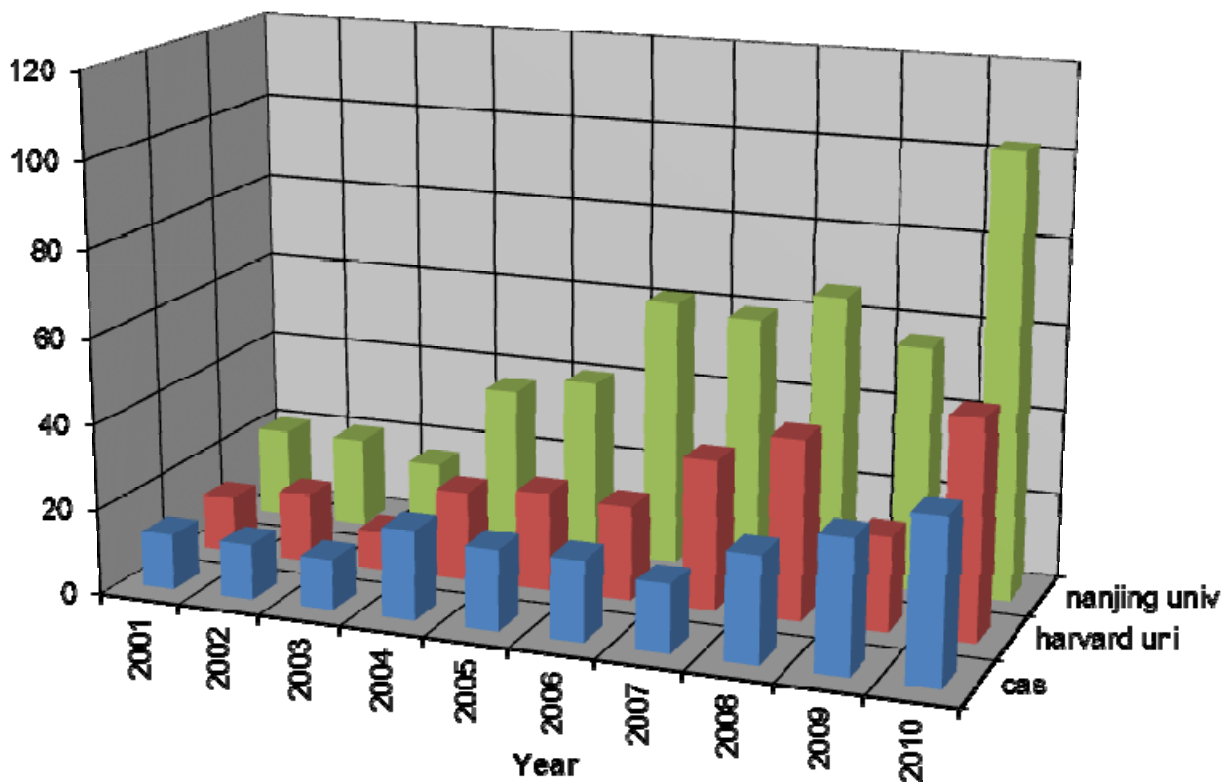
### 1、总体概况对比

对比机构：中科院化学所(Chinese Acad Sci, Inst Chem)、南京大学 (Nanjing Univ)以及哈佛大学 (Harvard Univ)

| 论文量 | 对比机构         | 主要合作机构             | 主要合作国家                                       | 近三年发文比     | 主要技术术语   |
|-----|--------------|--------------------|--|------------|--|
| 405 | nanjing univ | harvard uni [190]  | Peoples R China [220]; USA [193]; Canada [8] | 43% of 405 | capillary electrophoresis [32]; fluorescence [20]; poly(dimethylsiloxane) [16] |
| 195 | cas          | None               | Peoples R China [195]; USA [5]; Germany [4]  | 45% of 195 | capillary electrophoresis [20]; fluorescence [14]; fluorescent probe [10]      |
| 190 | harvard uni  | nanjing univ [190] | USA [190]; Germany [7]; Italy [6]            | 37% of 190 | fluorescence [9]; capillary electrophoresis [7]; chemical biology [6]          |

## 2、论文产出与增长趋势对比

三个机构发表论文共 600 篇，其中中科院化学所 195、南京大学 405 篇、哈佛大学 190 篇，下图可以清晰的看到国际和中国发表论文的发展趋势。

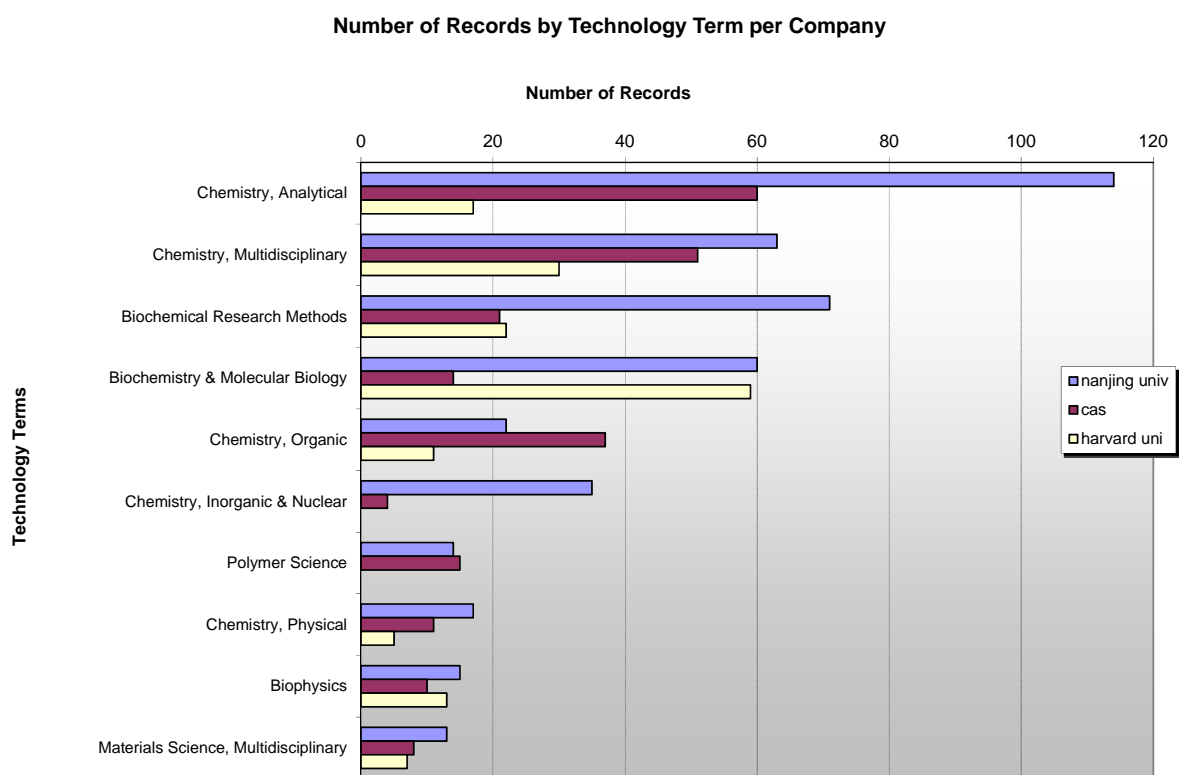


对比机构发表论文年代变化趋势

### 3、学科分布对比

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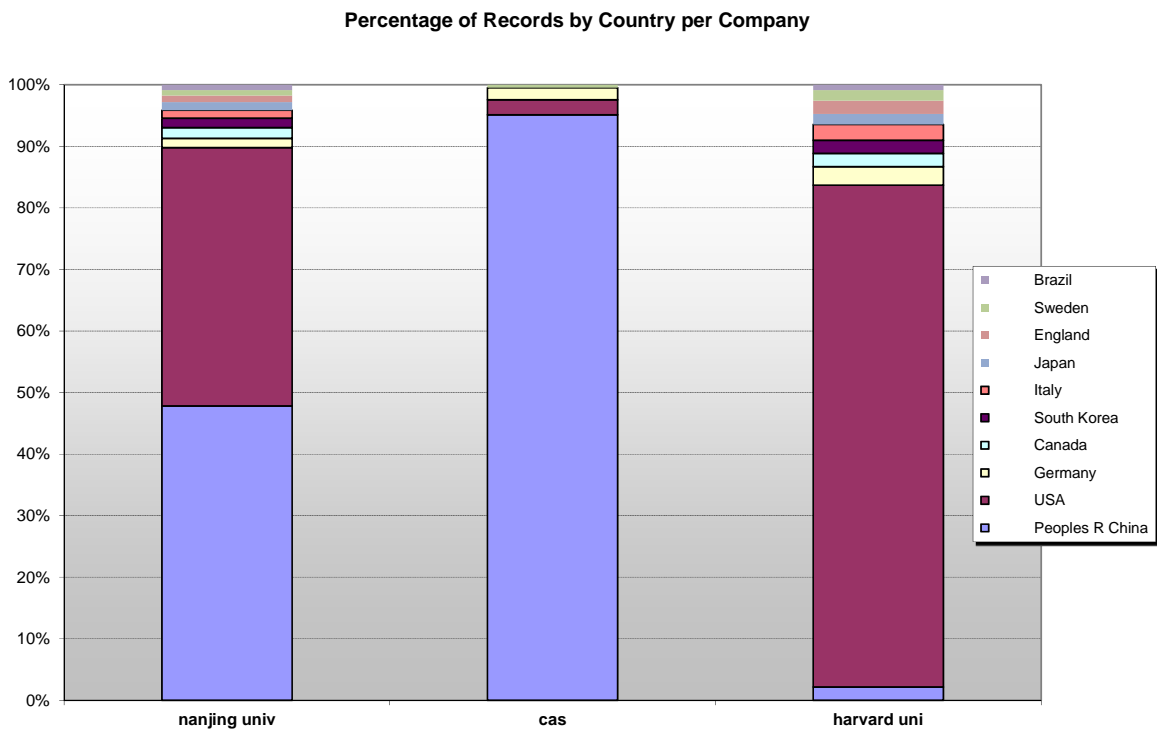
三个机构学科领域分布对比如下：



### 4、合作国家对比分析

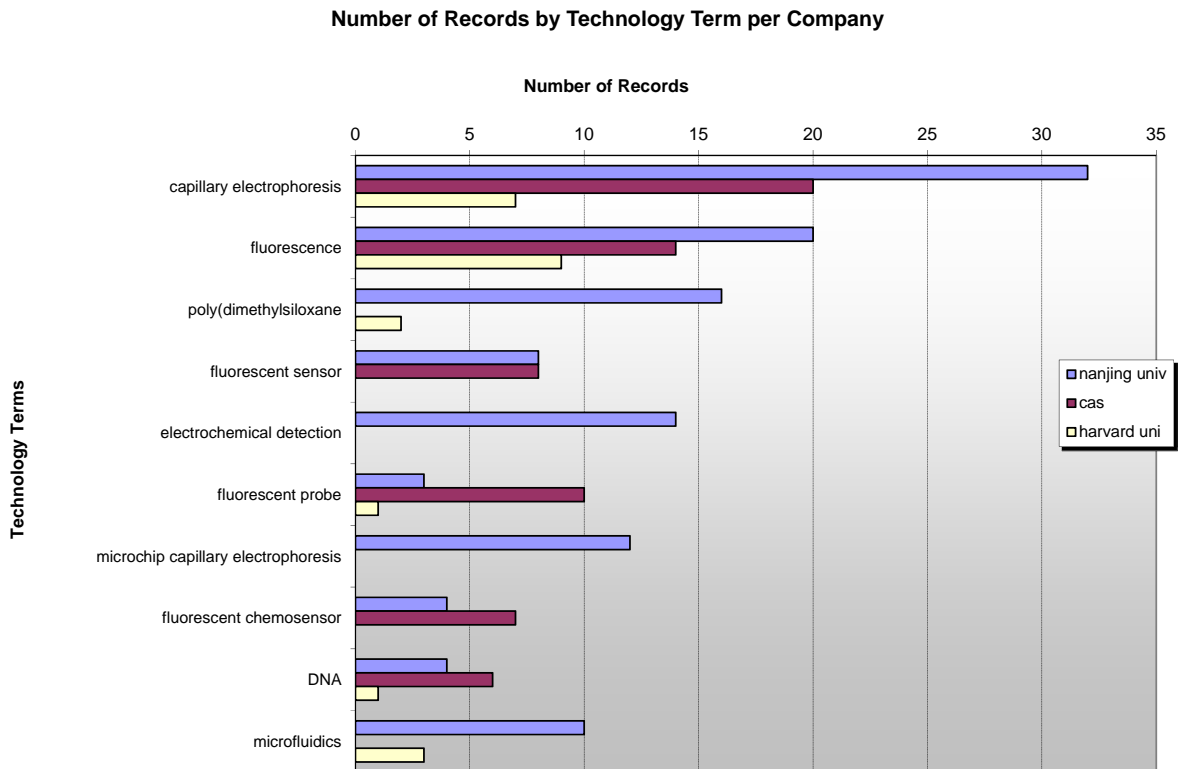
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三个机构合作的国家和地区对比分析如下：



## 5、技术术语对比分析

通过对研究三个机构 600 篇科技论文中的技术术语进行分析，可以对研究领域出现的高频词分布有一个大致的了解。



## *Technology Terms Unique To One Company*

| <b>Chinese Acad Sci inst chem</b>                | <b>Nanjing Univ</b>                                       | <b>Harvard Univ</b> |
|--|---|---------------------|
| enantioseparation [7]                            | electrochemical detection [14]<br>microchip capillary     | none                |
| conjugated polymers [6]                          | electrophoresis [12]                                      |                     |
| zinc complex [5]                                 | microchip electrophoresis [8]                             |                     |
| local polarity detection [5]                     | amperometric detection [6]                                |                     |
| Hg <sup>2+</sup> ions [4]                        | microchip [6]   |                     |
| ligand-exchange CE [4]                           | Mercury detection [5]                                     |                     |
| synthesis [3]                                    | electrochemiluminescence [5]<br>solid-state               |                     |
| histidine labeling [3]                           | electrochemiluminescence [3]                              |                     |
| copper [3]                                       | Click reaction [3]  |                     |
| analytical methods [3]                           | colorimetric [3]  |                     |
| molecular switch [3]                             | Heck reaction [3]   |                     |
| aromatic amines [3]                              | conjugated polymer [3]                                    |                     |
| enantiomer separation [3]                        | tris(2 [3]  |                     |
| FRET [3]   | ultraviolet detection [3]                                 |                     |
| glutathione [2]                                  | hydrostatic pressure [3]                                  |                     |
| sulfonamides [2]                                 | immunoassay [3]<br>indirect amperometric<br>detection [3] |                     |
| thymine [2]                                      | instrumentation [3]                                       |                     |
| conformational changes [2]                       | disposable device [3]                                     |                     |
| two-photon [2]                                   | microchip CE [3]  |                     |
| hydrolysis [2]                                   | nitric oxide [3]  |                     |
| copolymerization [2]                             | on-line preconcentration [3]                              |                     |
| image [2]  | Optically active<br>polybinaphthyls [3]                   |                     |
| Cu <sup>2+</sup> [2]                             | 2 [3]   |                     |
| block copolymer [2]                              |   |                     |
| intermolecular hydrogen bond<br>[2]              | quality control [3]                                       |                     |
| intramolecular charge transfer<br>[2]            | selectivity [3]   |                     |
| anion recognition [2]                            | Fracture sampling [3]                                     |                     |
| Dansyl amino acid [2]                            | simultaneous determination [3]                            |                     |
| ligand-exchange capillary<br>electrophoresis [2] |   |                     |
| MEKC [2]   | gold electrode [2]  |                     |
| diffusion coefficient [2]                        | surface modification [2]                                  |                     |
| dihydrogen phosphate [2]                         | sweeping [2]  |                     |
| methyl orange [2]                                | thionine [2]  |                     |
| methyl red [2]                                   | tilting microchip [2]                                     |                     |
| adsorption [2]                                   | tramadol [2]  |                     |
| micelles [2]                                     | 2'-bipyridine [2]   |                     |
| migration [2]                                    | HRP [2]   |                     |
| N-terminal specific labeling [2]                 | acetaminophen [2]   |                     |
| arginine-specific labeling [2]                   | I [2]   |                     |
| carbohydrate [2]                                 | cordyceps [2]   |                     |
|  | zirconia-nafion composite [2]                             |                     |

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|                                |                                |
|--------------------------------|--------------------------------|
| on-line sweeping technique [2] | crystal structure [2]          |
| enzyme kinetics [2]            | lidocaine [2]                  |
| phosphodiester [2]             | degradation [2]                |
| polydiacetylene [2]            | detection [2]                  |
| charge transfer [2]            | determination [2]              |
| false peak [2]                 | 2'-bipyridyl)ruthenium(II) [2] |
| pyrene [2]                     | mercury ions [2]               |
| fluorescence enhancement [2]   | microchannel [2]               |
| Raman spectroscopy [2]         | dopamine [2]                   |
|                                | Mitochondria membrane          |
| chemosensors [2]               | potential [2]                  |
| red blood cell [2]             | multianalyte determination [2] |
| Rhodamine B [2]                | electrochemistry [2]           |
| fluorescent spectra [2]        | electrokinetic control [2]     |
| beta-lactoglobulin [2]         | ELISA [2]                      |
| selective tryptophan           |                                |
| modification [1]               | p-aminophenol [2]              |
| selective detection [1]        | EOF measurement [2]            |
| selective [1]                  | CEA [2]                        |
| fluoride ions [1]              | epinephrine [2]                |
|                                | poly(dimethylsiloxane) (PDMS   |
| Salvia miltiorrhiza Bunge [1]  | [2]                            |
| saccharide [1]                 | chemiluminescence [2]          |
| Ru(phen)(2)(dppx)(2) [1]       | chiral conjugated polymer [2]  |
| Rotigotine [1]                 | sample stacking [2]            |
|                                | Selective fluorescence sensor  |
| Rotatable single bond [1]      | [2]                            |
| RNA [1]                        | self-assembled monolayer [2]   |
| rice-wine product [1]          | separation efficiency [2]      |
| ribonuclease A [1]             | binding constants [2]          |
| rhodamine derivative [1]       | Self Assembly [1]              |
| Rhodamine B hydroxylamide      |                                |
| [1]                            | Selenolactone [1]              |
| Reversible [1]                 | selectivity optimization [1]   |
| resonance Rayleigh scattering  |                                |
| detection [1]                  | binaphthol [1]                 |
| reproducibility [1]            | SECM [1]                       |
| Red-shift [1]                  | Screen printed electrodes [1]  |
| Red-emitting [1]               | scopolamine [1]                |
| Fluorescence Recovery [1]      | Schiff base [1]                |
| reactive oxygen species [1]    |                                |
| ratiometric measurement [1]    |                                |

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## *Technology Terms Shared By Only Two Companies*

| <b>nanjing univ &amp; Chinese Acad Sci inst Chem</b> | <b>nanjing univ &amp; Harvard Univ</b> | <b>Chinese Acad Sci inst chem &amp; Harvard univ</b> |
|--|--|--|
| fluorescent sensor [16]                              | poly(dimethylsiloxane) [16]            | none   |
| fluorescent chemosensor [11]                         | microfluidics [10]                     |  |
| sensors [9]  | chemical biology [6]                   |  |
| chemosensor [7]                                      | miniaturization [4]                    |  |
| fluorescence sensor [7]                              | PDMS [3]                               |  |
| sensor [7]   | proteomics [3]                         |  |
| calixarene [6]                                       | fluorophore [3]                        |  |
| beta-cyclodextrin [6]                                | surface [2]                            |  |
| human serum albumin [5]                              | biomarker [2]                          |  |
| molecular recognition [5]                            | human milk oligosaccharides [2]        |  |
| bovine serum albumin [4]                             | kinetics [2]                           |  |
| fluorescence chemosensor [4]                         | mitochondria [2]                       |  |
| chiral separation [4]                                | drug discovery [2]                     |  |
| gold nanoparticles [3]                               | molecular imaging [2]                  |  |
| interaction [3]                                      | near-infrared fluorescence [2]         |  |
| anion [3]  | notch [2]                              |  |
| luminescence [3]                                     | electrostatic interactions [2]         |  |
| calix[4]arene [3]                                    | carbonic anhydrase [2]                 |  |
| calixarenes [3]                                      | atherosclerosis [2]                    |  |
| drug release [3]                                     | enzyme activation [2]                  |  |
| CE [3]   | peptide [2]                            |  |
| PET [3]  | photodynamic therapy [2]               |  |
| ratiometric [3]                                      | fluorescence molecular tomography [2]  |  |
|  | chemotaxis [2]                         |  |
| sol-gel [2]  | sialyloligosaccharides [2]             |  |
| bioimaging [2]                                       | small molecule inhibitor [2]           |  |
| tetrathiafulvalene [2]                               | selectivity of extinction [1]          |  |
| high performance capillary electrophoresis [2]       | Selective logging [1]                  |  |
| water-soluble conjugated polymer [2]                 |  |  |
| cysteine [2]   | folic acid [1]                         |  |
| anthracene [2]                                       | secretory pathway [1]                  |  |
| MCE [2]  | screening [1]                          |  |
| mercury [2]  | screen [1]                             |  |
| pH [2]   | scavenger receptor [1]                 |  |
| Fe <sub>3</sub> [2]                                  | ryanodine receptor (RyR) [1]           |  |
| 3 [2]  | retinal detachment [1]                 |  |
| recognition [2]                                      | retina [1]                             |  |
| fluorescent [2]                                      | renal obstruction [1]                  |  |
| rhodamine [2]  | renal failure [1]                      |  |
| chiral capillary electrophoresis [2]                 | renal disease [1]                      |  |
| fluoride ion [2]                                     | regeneration [1]                       |  |
| chiral recognition [2]                               | fluorescence reflectance imaging [1]   |  |
|  | receptors [1]                          |  |
| food analysis [2]                                    | RBC [1]                                |  |
|  | fluorescence microscopy [1]            |  |
|  | quantitative histological analysis [1] |  |
|  | quantification [1]                     |  |
|  | PTP 1B [1]                             |  |



## 6、基金资助对比

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| 基金组织   | 南京大<br>学 | 哈佛<br>大学 | 中科院化学<br>所 |
|--|----------|----------|------------|
| National Natural Science Foundation of China                   | 46       |          | 28         |
| Chinese Academy of Sciences                                    |          |          | 34         |
| NSFC   | 7        |          | 17         |
| National Basic Research Program of China                       | 14       |          | 5          |
| Ministry of Science and Technology of China                    | 3        |          | 15         |
| NSF of China   | 1        |          | 12         |
| NIH  | 10       | 10       | 1          |
| 973 National Key Basic Research Program of China               | 5        |          | 5          |
| 863 program  | 3        |          | 5          |
| National Institutes of Health                                  | 8        | 8        |            |
| National Science Foundation of China                           | 6        | 1        | 1          |
| National Basic Research Program                                | 4        |          | 2          |
| National Science Fund for Creative Research Groups             | 5        |          |            |
| Natural Science Foundation of Jiangsu Province                 | 5        |          |            |
| National Natural Science Funds for Creative Research<br>Groups | 4        |          |            |
| Shanghai Leading academic Discipline Project                   | 3        |          | 1          |
| Ministry of Science and Technology                             | 1        |          | 3          |

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## 六、小结

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以美国科学情报研究所（ISI）开发的基于 Web 的 Web of Science 网络数据库为数据源基础，对 2001-2010SCIE 和 2001-2010 的 CPCI-S 中收录的研究领域论文的情况进行了统计与分析。

目的在于为了解研究领域的概况，提供一定参考。

如有纰漏，请指正。

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