REPORT BY INNOVATION CENTRE DENMARK, SHANGHAI

PRECISION MEDICINE

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Ministry of Higher Education and Science Denmark

MINISTRY OF FOREIGN AFFAIRS OF DENMARK

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\ ABBREVIATIONS

n	Continue alphabetically
EU	European Union
ToR	Terms of Reference
US	United States of America
CN	People's Republic of China
MEUR	Million Euro
CNIPA	China National Intellectual Property Administ
DK	Denmark

PART 1: INTRODUCTION

1 BACKGROUND

When it comes to medicine and treatment, one size does not fit all patients' needs. Treatment that helps some patients may be ineffective for others; in the meanwhile the same medicine may cause side effects in only certain patients. That is why precision medicine has been highly recommended and promoted by both medical professionals and government.

Precision medicine focuses on "tailoring" diagnosis and treatment plans according to the individual characteristics of each patient and the patient's gene and protein information. Precision medicine is an evolving field in which physicians use diagnostic tests to determine which medical treatments will work best for each patient or use medical interventions to alter molecular mechanisms that affect health. By combining data from diagnostic tests with an individual's medical history, circumstances and values, health care providers can develop targeted treatment and prevention plans with their patients [1].

China has entered the aging society since 1999, and the aging of the population has become one of the major social problems in China. It also poses severe challenges to social pension institutions, sub-health management platforms and medical service guarantees. Many elderly people are facing a variety of chronic diseases, such as neurodegenerative diseases, cancer, cardiovascular and cerebrovascular diseases. According to the characteristics of China's aging population, the Chinese government regards precision medicine as an important strategy to actively respond to population aging.

Over the years, China has introduced a series of policies on precision medicine (Figure 1.). In February 2015, Chinese President Xi Jinping instructed the establishment of the China Precision Medicine Strategy Expert Group. In March 2015, the Ministry of Science and Technology held the first national meeting of experts on precision medicine strategies, and decided to invest 60 billion RMB in the field of precision medicine by 2030, launching the Chinese version of the "Precision Medicine Plan".

In 2016, precision medicine was included in the "Special Plan on Health and Health Technology Innovation during the 13th Five-Year Plan Period" to vigorously promote the innovation and industrialization of precision medicine and other emerging frontier fields.

The "Healthy China 2030" Planning Outline points out that it is necessary to strengthen the early detection and treatment of chronic diseases, such as cancer, stroke, and coronary heart disease. "Implementing cancer prevention and control actions, promoting preventive screening, early diagnosis and early treatment, and scientific research" was written into the "2019 Government Work Report".

The "Special Plan on Health and Health Technology Innovation during the 13th Five-Year Plan Period" issued by National Health and Family Planning Commission of the People's Republic of China proposed 12 key tasks, including strengthening applied basic research, promoting cutting-edge technology innovation, enhancing disease prevention and control, protecting the health of key populations, developing pharmaceutical and health products, developing new health service technologies, strengthening health risk factor control, promoting the popularization of science and technology, advancing the modernization of Chinese medicine, strengthening

innovation base platforms and capacity building, promoting the transfer and transformation of results, and building international cooperation networks.

The content of these policies related to precision medicine also points out the research hotspots and future expectations for precision medicine development in China.

Department	Time	Policy	Fields
Ministry of Science and Technology	2015/3/1	Held the first expert meeting on "precision medicine" strategy, decided to invest 60 billion yuan in the field of precision medicine by 2030, and established a national expert committee on precision medicine strategy consisting of 19 experts	Precision medicine
Ministry of Science and Technology	2016/3/1	Announced the "13th Five-Year Plan" "Precision Medicine" major science and technology special project, and released specific research plans	Precision medicine
National Development and Reform Commission	2017/1/1	Released the "Thirteenth Five-Year Plan" for the development of biological industry and accelerated the development of new models of precision medicine	Precision medicine
National Development and Reform Commission	2017/2/1	Genetic technology is officially written into the Development and Reform Commission's 2017 No. 1: "Strategic Emerging Industry Key Products and Services Guidance Catalogue	Precision medicine
State Drug Administration	2017/6/1	State Food and Drug Administration Joins ICH (International Council on Harmonization of Medicinal Regulations), Hoping for Faster Access to Innovative Medicines for Chinese Patients	Precision medicine
National Development and Reform Commission	2017/10/1	Approval of the second batch of gene testing technology application demonstration center construction program	Accurate Diagnosis
National Health Council of China	2017/12/1	Two individualized medicine guidelines were published	Precise Treatment
State Drug Administration	2018/6/1	Officially approved the first PD-1 inhibitor Ondivol (Navulizumab injection) for marketing	Precise Treatment
National Health Council of China	2018/9/1	Release of national health care big data standards	Accurate Diagnosis
National Health Council of China	2018/9/1	Released the Guidelines for Clinical Application of New Antitumor Drugs (2018 Edition), covering 7 major types of tumors and 42 types of anticancer drugs	Precise Treatment
State Council	2019/3/5	"Implementing cancer prevention and treatment actions, promoting prevention and screening, early diagnosis and treatment, and scientific research and development" was included in the 2019 Government Work Report.	Precision medicine
State Council	2019/7/9	The State Council's "Opinions on the Implementation of Health China Action" and "Health China Action (2019-2030)" were issued to promote the shift from a treatment-centered approach to a people's health-centered approach and to increase cancer screening.	Precision medicine

Figure 1. Policies related to precision medicine in China

As a representative of Sino-Danish collaboration, Innovation Centre Denmark Shanghai has done a precision medicine sector mapping report, which contains the analysis of China capacity on precision medicine. The research was based on patents, international collaboration, and university publications. Precision medicine has

been divided in 6 sub-domains based on keyword clustering, which are Genome Study for Cardiovascular Disease, Genome Study for Cancer, Precision Medicine Technology for Cardiovascular Disease, Precision Medicine Technology for Cancer, Medical Imaging, and Traditional Chinese Medicine, among which, Precision Medicine Technology for Cancer was the mostly mentioned by scientific publications. This report also provides a detailed description of the number of scientific publications, main institutions and main authors, scientific collaborations and patents related to the above 6 sub-domains in EU, USA and China over the past decade.

To sum up, this report offers a complementary perspective to the field of precision medicine. Potential stakeholders can get systematic understanding of the R&D in precision medicine, and make future research and business plans with the insight from this report.

[1] "Toward Anew Era." Precision Medicine Coalition - Precision Medicine Advocacy and Education., https://www.precisionmedicinecoalition.org/index.cfm.

2 DEFINITIONS

Personalized Medicine has been divided in 6 sub-domains:

- **Genome Study for Cardiovascular Disease**
- **Genome Study for Cancer**
- **Personalized Medicine Technology for Cardiovascular Disease**
- **Personalized Medicine Technology for Cancer**
- **Medical Imaging**
- **Traditional Chinese Medicine**

This sub-division is based on keyword clustering that arises in all the world's scientific literature in this area, combined with conceptual clustering. The 400 most prominent keywords were identified from a number of initial keywords using the 'pearl growing' technique. These keywords were then clustered in a force directed graphic, where the strengths of links are based on overlap of publications mentioning the same keywords.

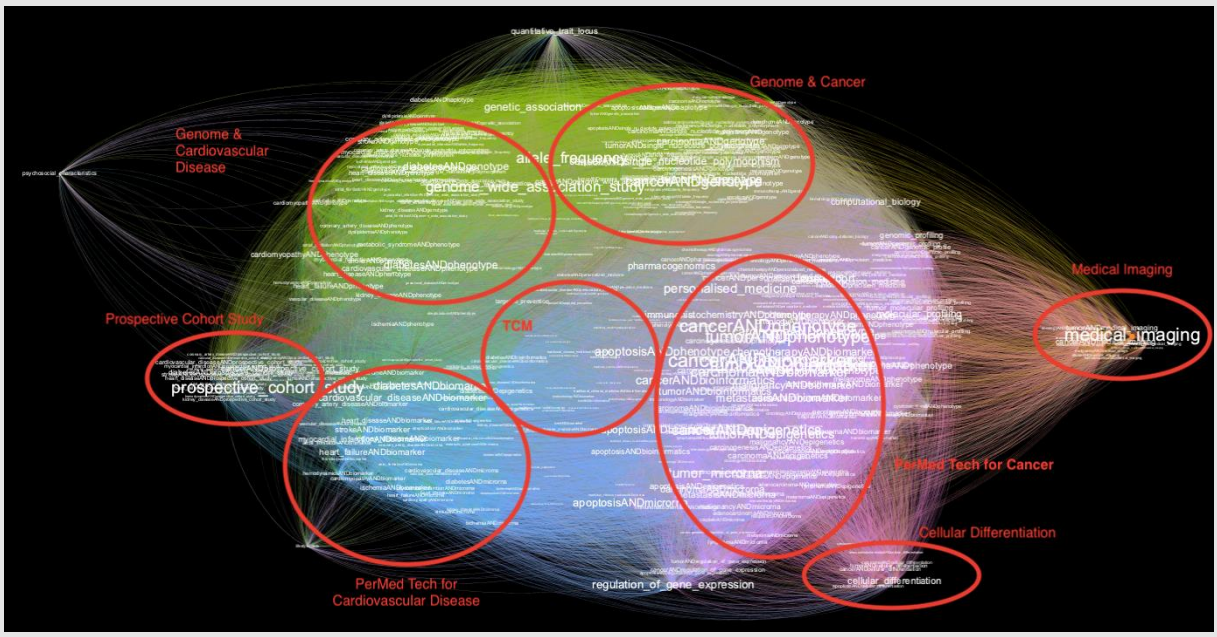


Figure 1 Force-directed graphic identifying the sub-domains and its keywords: general overview

Cluster forming in a force-directed graphic. Circles (nodes) represent single keywords, where larger size means more publications mention that keyword. The nodes attract each other more if there is more overlap in publications, by which natural clusters arise from the data. Nodes are clustered into different colour groups using the 'Leiden Algorithm'. These finer clusters are then manually grouped together (and sometimes split), to allow for a subdivision that matches our conceptual understanding, as indicated by the larger coloured areas.

Please note that not all keywords found their way into a cluster, particularly those that were considered too general or not related enough to the topic. It is also possible that particular keywords deemed relevant did not make it into the top 200 keywords to begin with. However, this means there are relatively little publications written on this topic and including it will not make a big difference in the statistics.

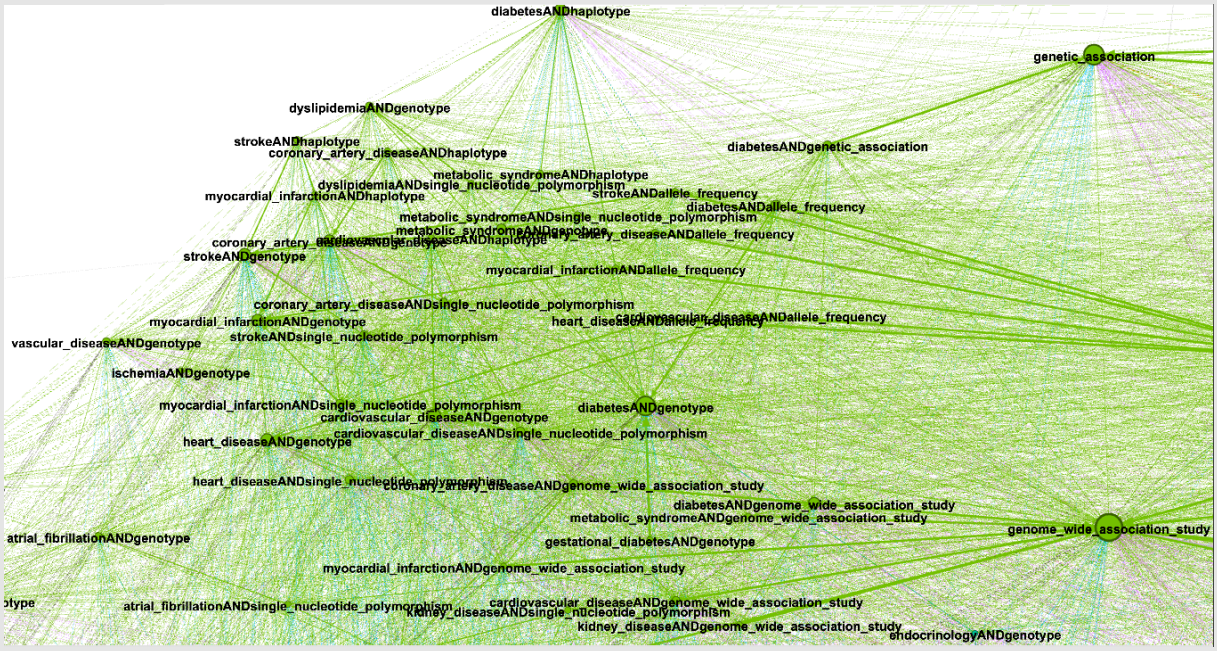


Figure 2 Force-directed Graphic - detail: Genome Study for Cardiovascular Disease

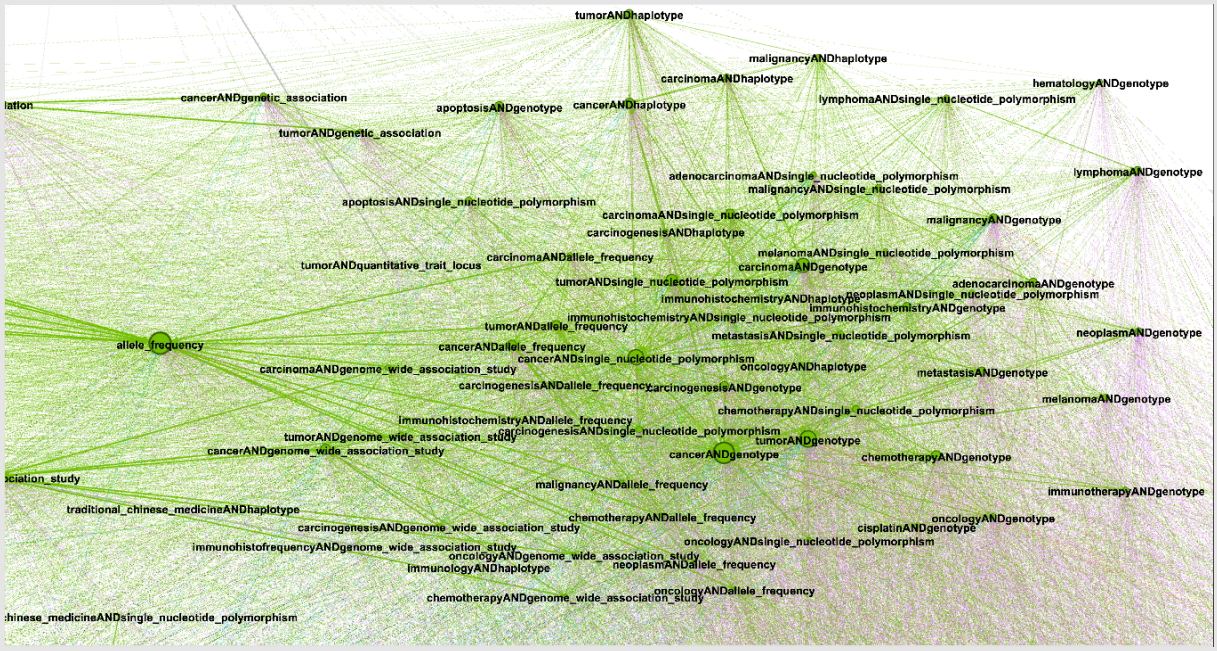


Figure 3 Force-directed Graphic - detail: Genotype Study for Cancer

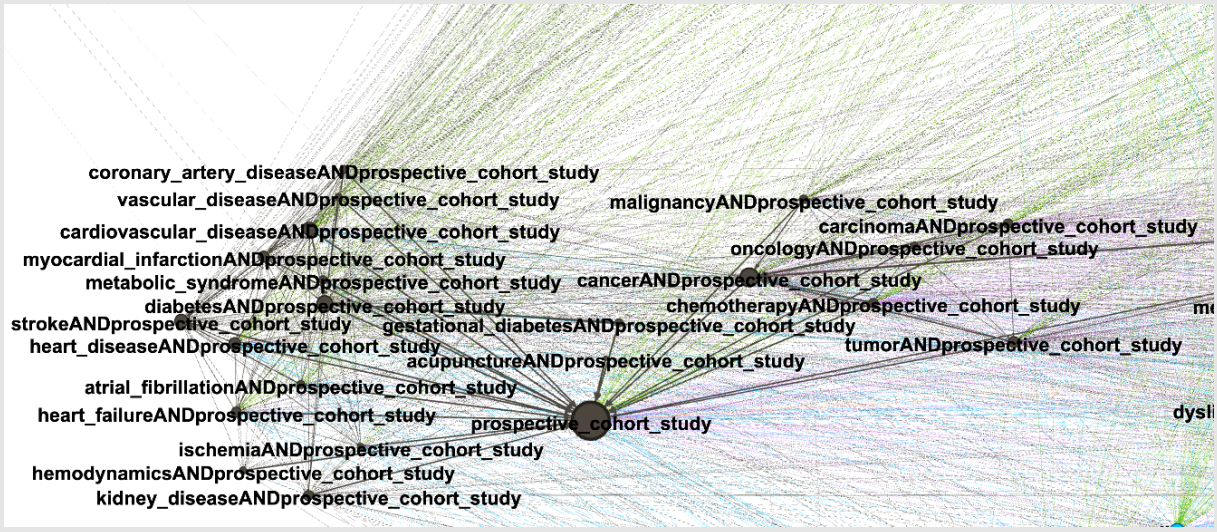


Figure 4 Force-directed Graphic - detail: Prospective Cohort Study

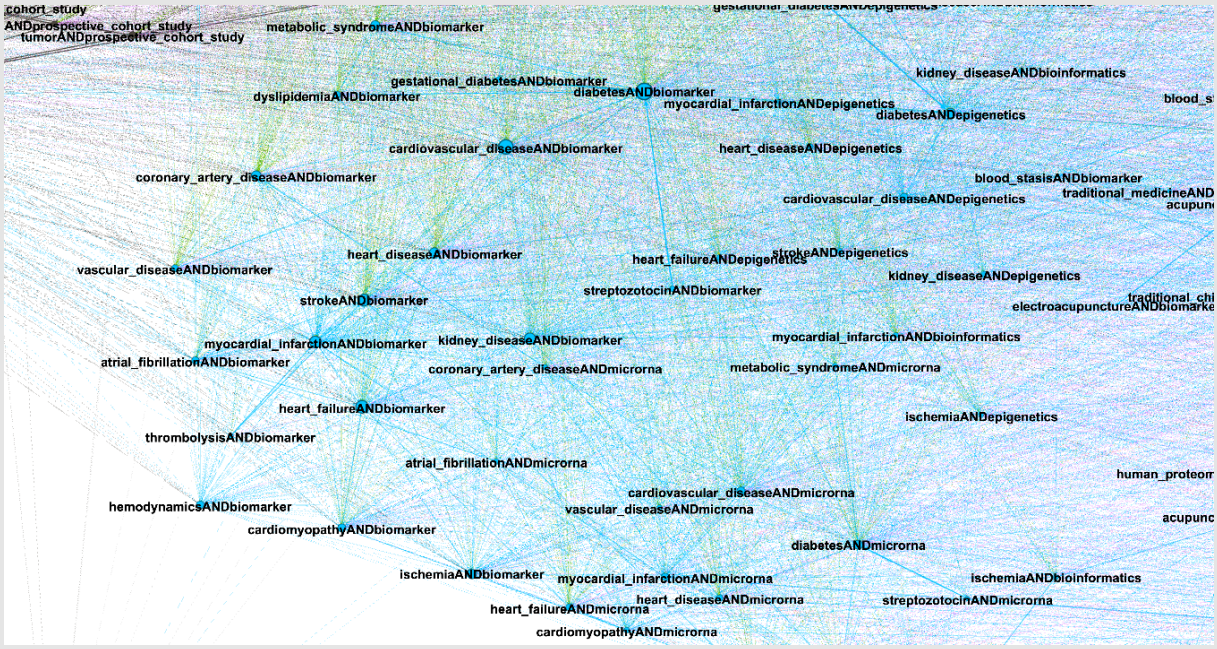


Figure 5 Force-directed graphic - detail: Personalized Medicine Technology for Cardiovascular Disease

Figure 6 Force-directed graphic - detail: Personalized Medicine Technology for Cancer

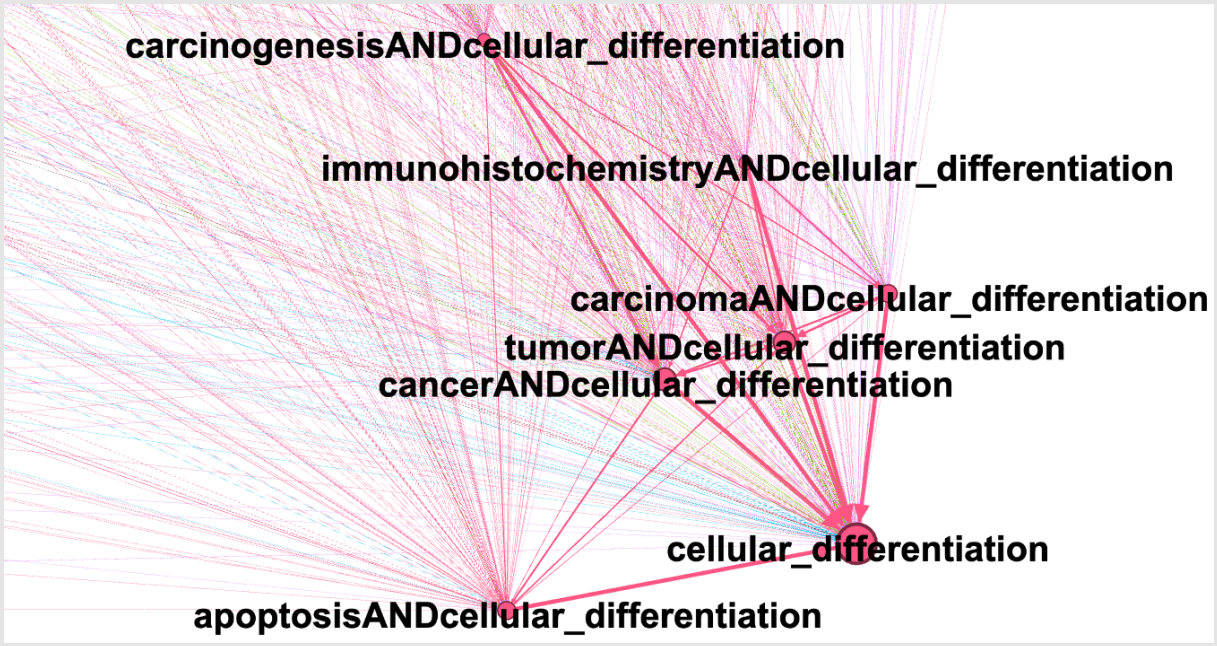


Figure 7 Force-directed graphic - detail: Cellular Differentiation

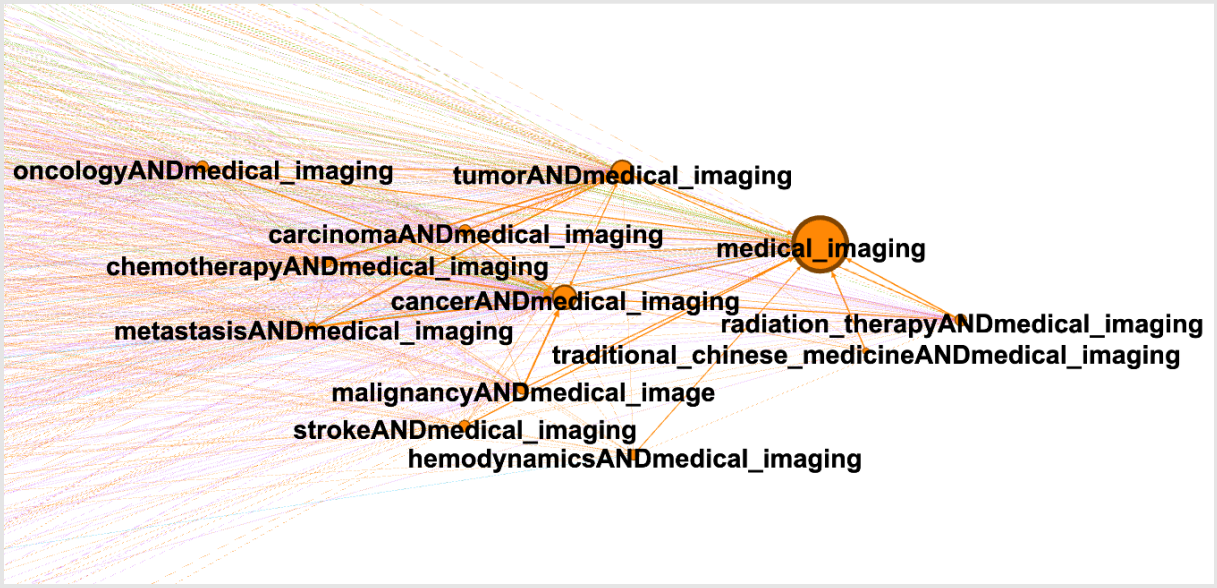
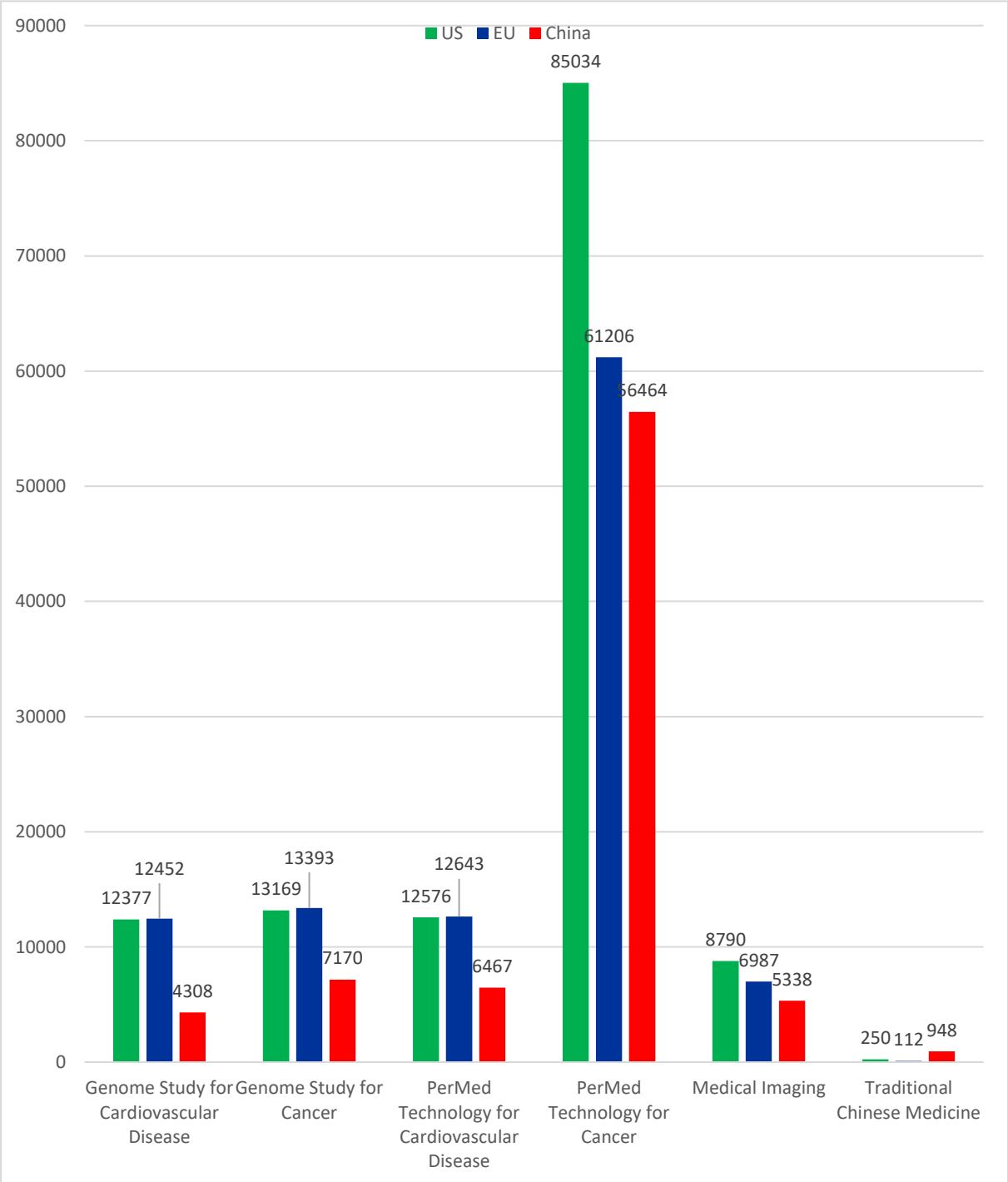


Figure 8 Force-directed graphic - detail: Medical Imaging

Figure 9 Force-directed graphic - detail: Traditional Chinese Medicine

PART 2: SCIENTIFIC PUBLICATIONS (SOURCE: LENSE)

3 COMPARISON OF SCHOLARLY OUTPUT: EU, USA, CHINA



Graph 1 Scholarly Output: Comparison EU/US/CN over the period 2011-2020

4 SCIENTIFIC PUBLICATIONS - YEARLY OUTPUT 2011-2020: TOP 10 COUNTRIES + EU + DK

4.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE

4.1.1 Word Maps

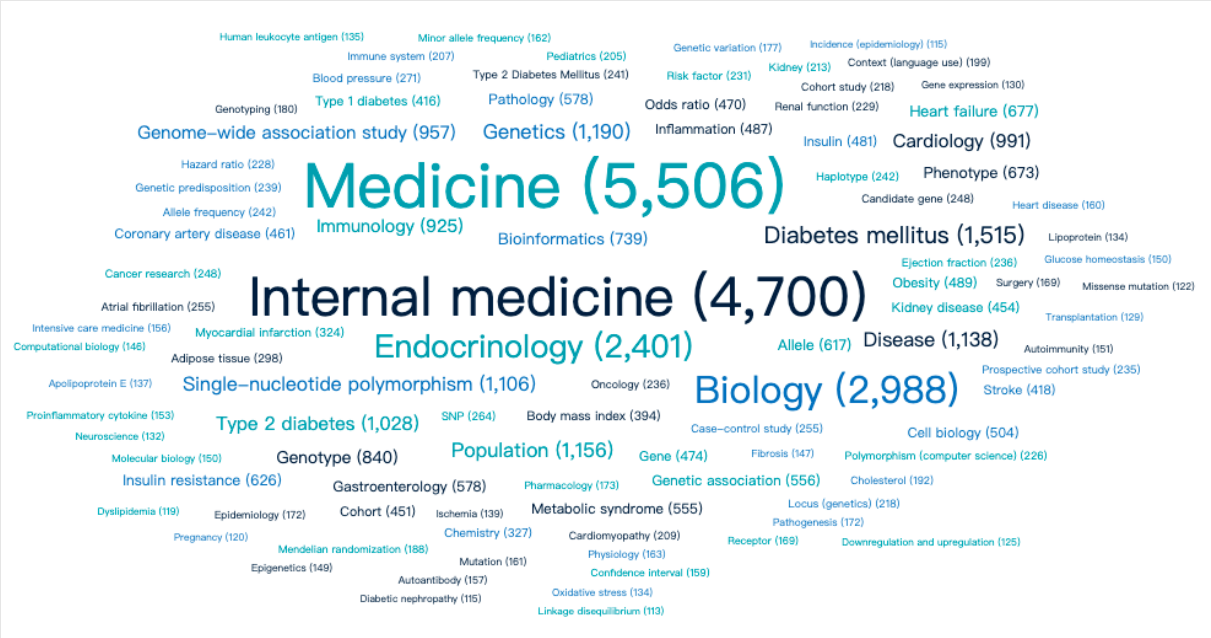


Figure 10 Genome Study for Cardiovascular Disease: Word Map – EU27

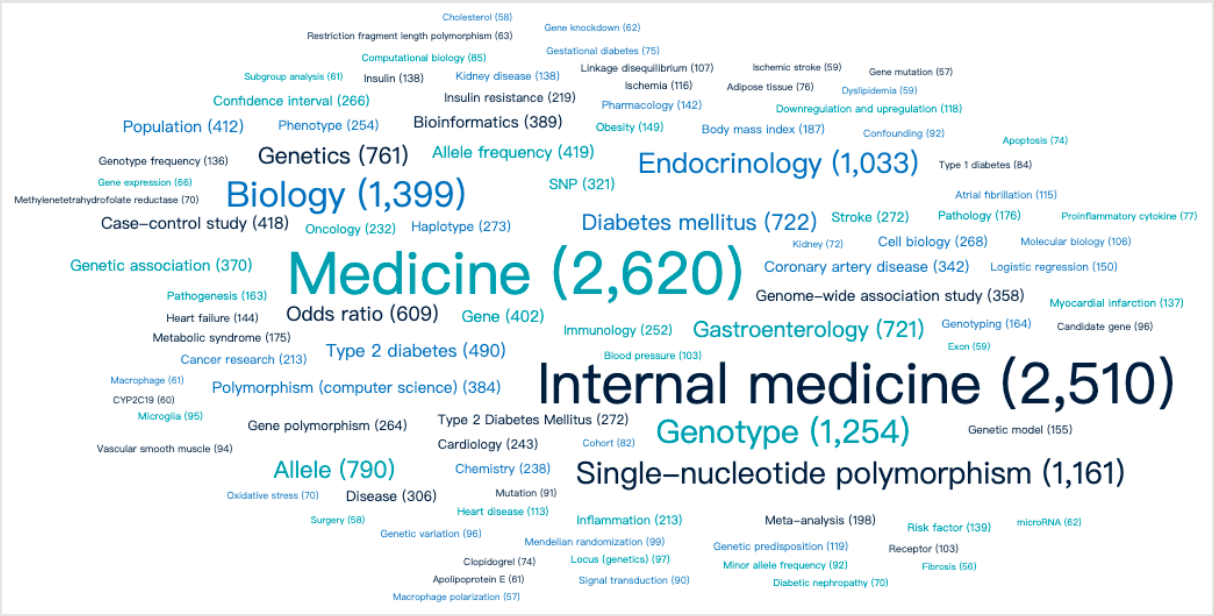
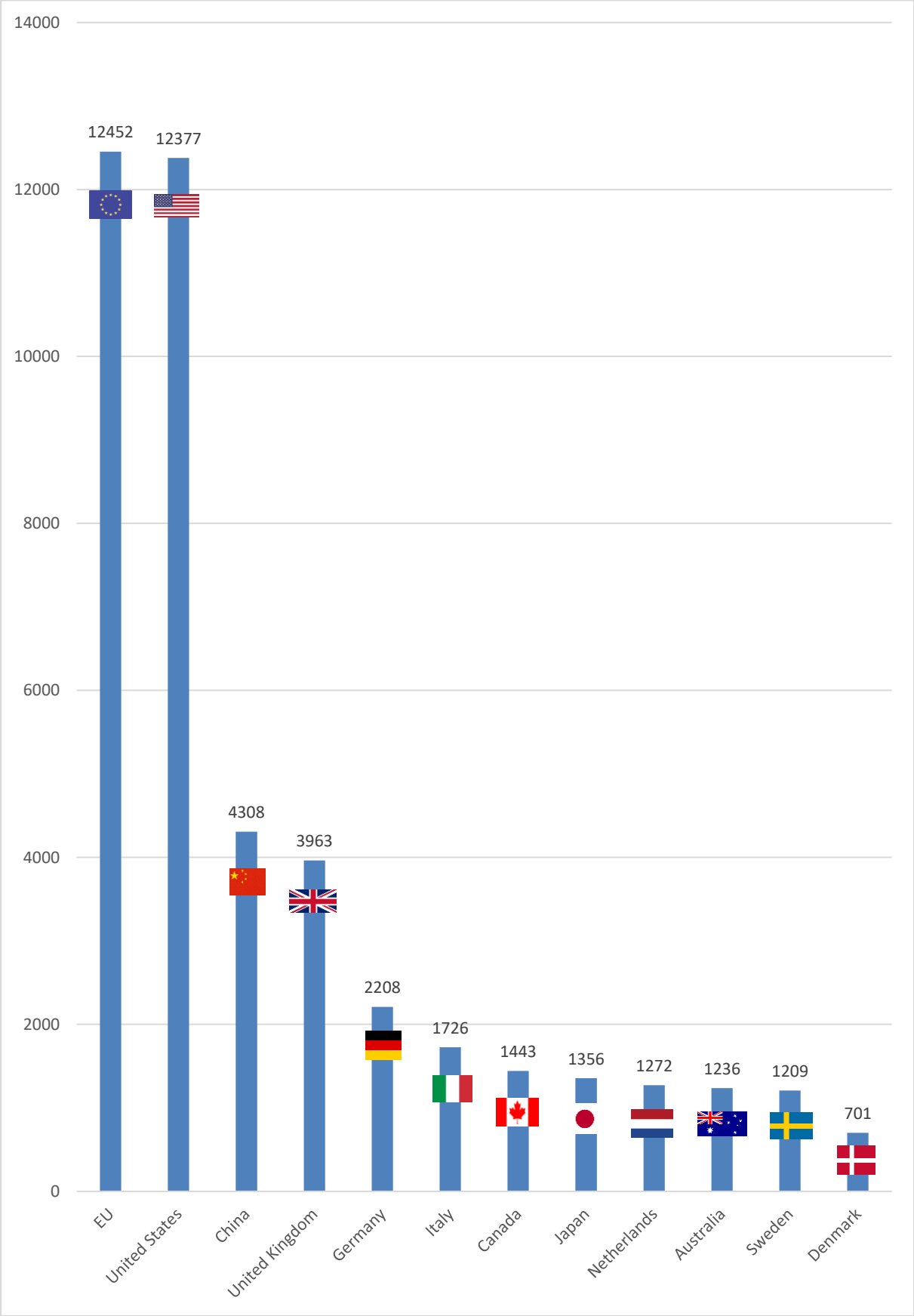


Figure 11 Genome Study for Cardiovascular Disease: Word Map – China

4.1.1.1 Countries



Graph 2 Cement Co-processing - Scholarly Output

4.2 GENOME STUDY FOR CANCER

4.2.1 Word Maps

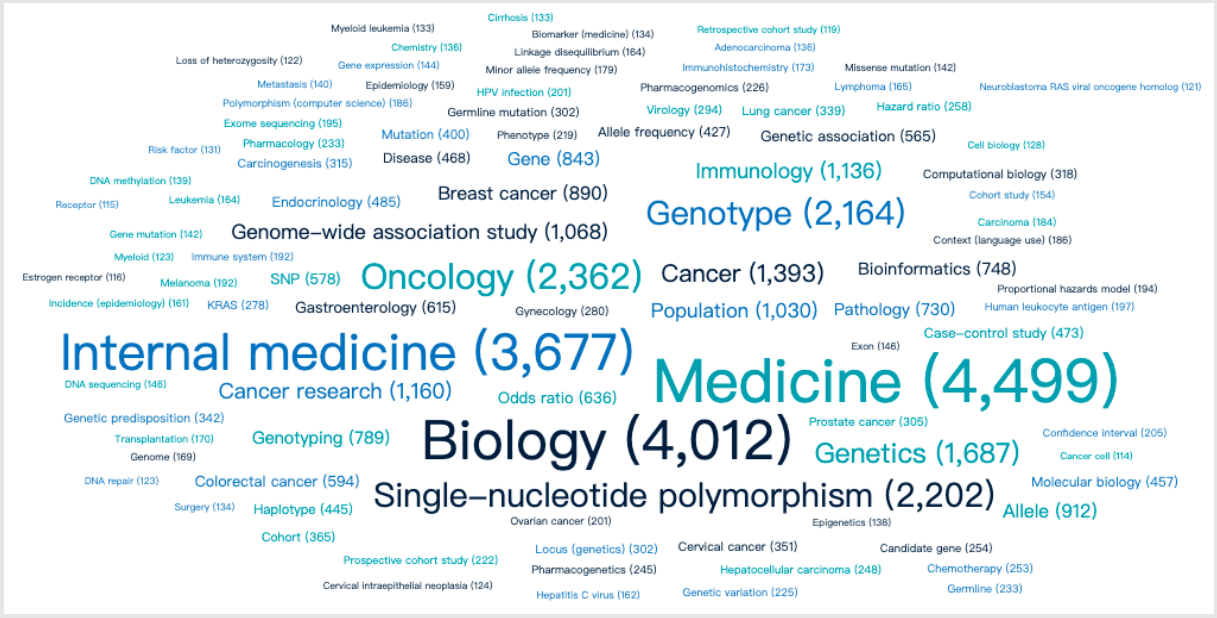


Figure 12 Genome Study for Cancer: Word Map - EU27

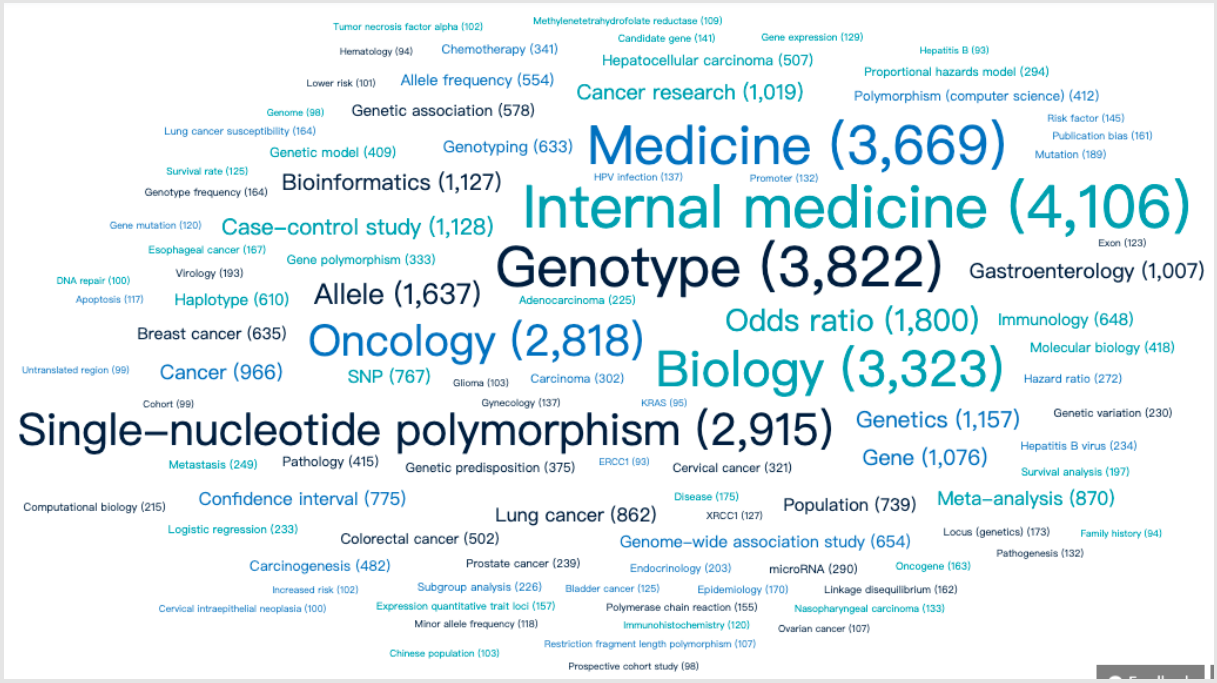
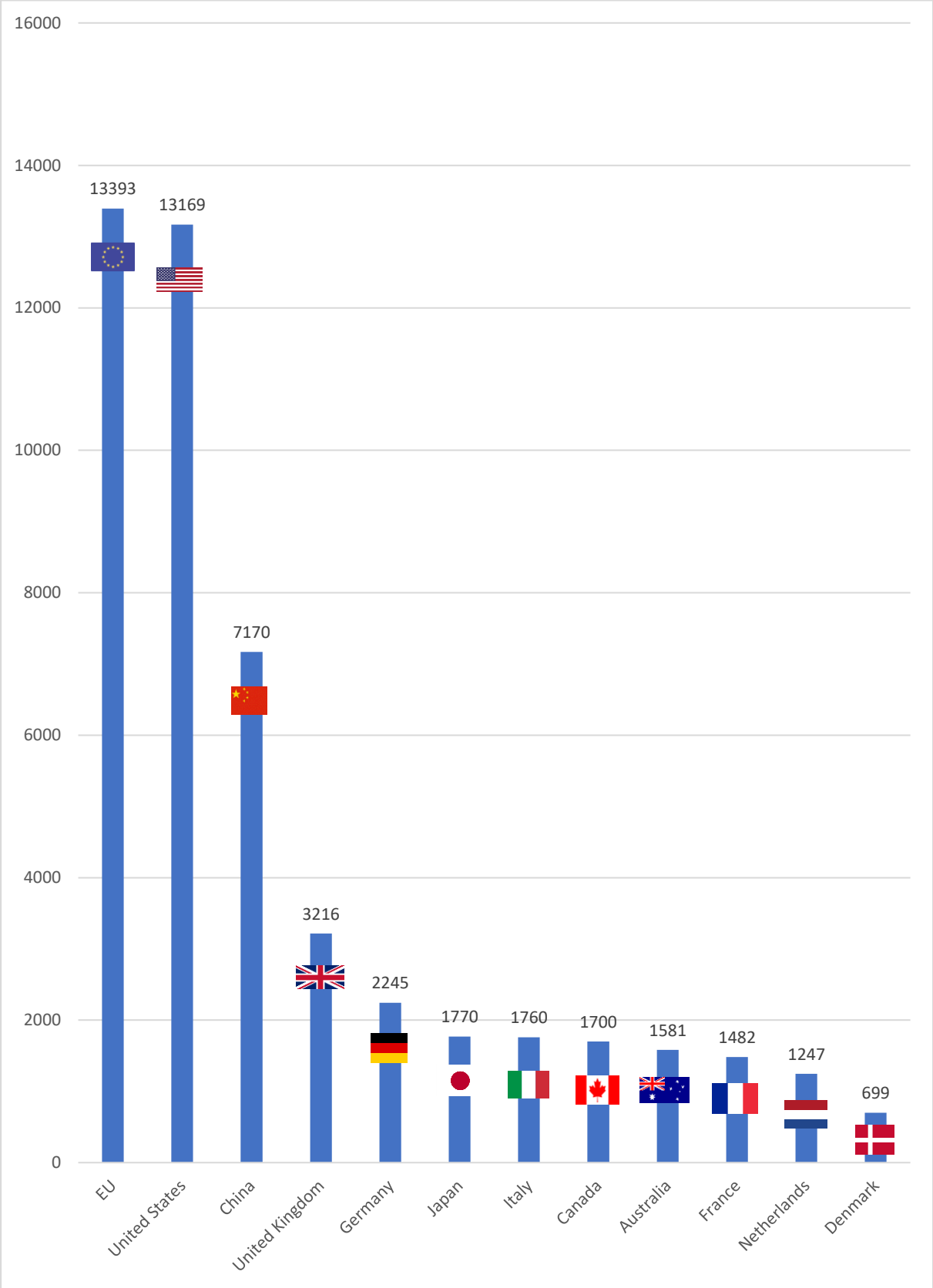


Figure 13 Genome Study for Cancer: Word Map – China

4.2.2 Countries



Graph 3 Genome Study for Cancer - Scholarly Output

4.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE

4.3.1 Word Maps

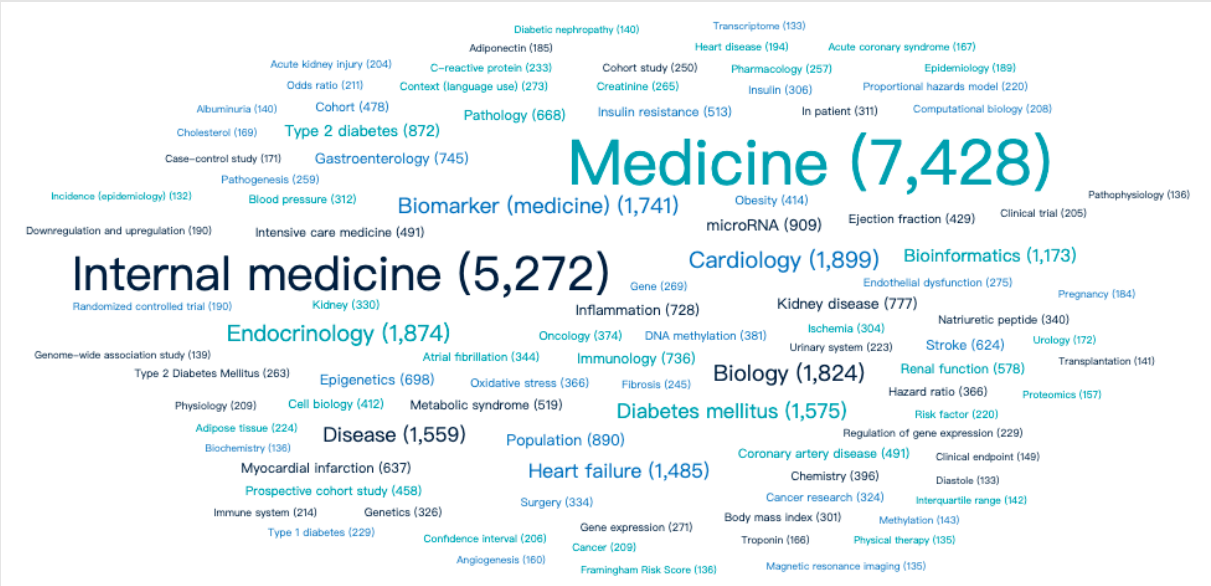


Figure 14 Personalized Medicine Technology for Cardiovascular Disease: Word Map - EU27

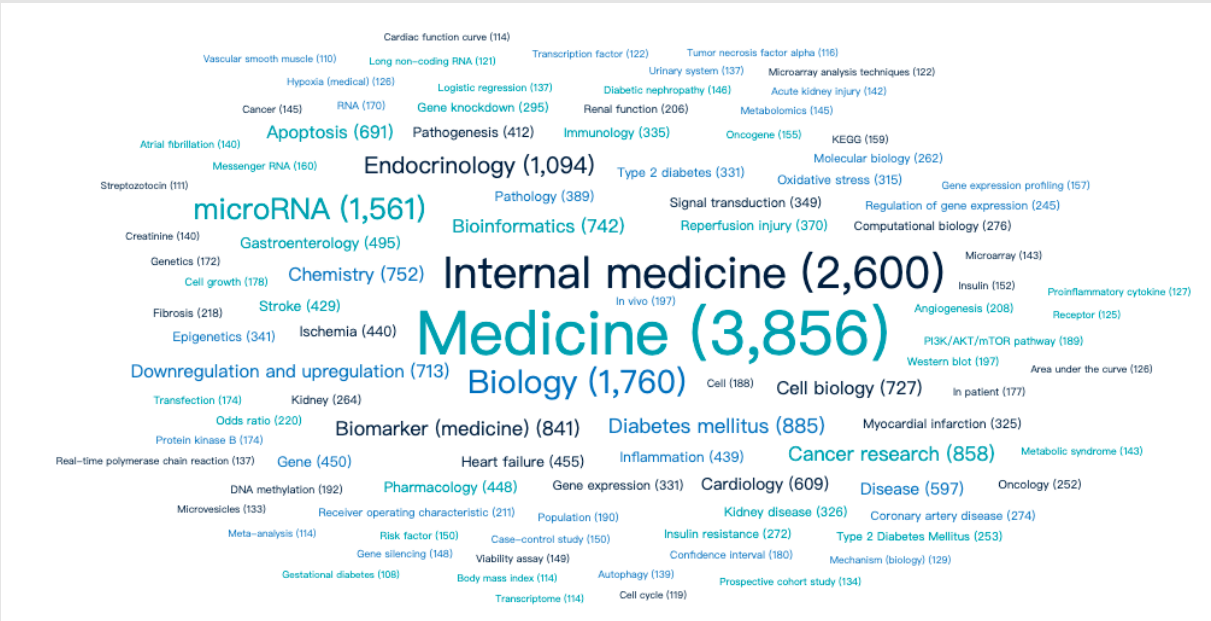
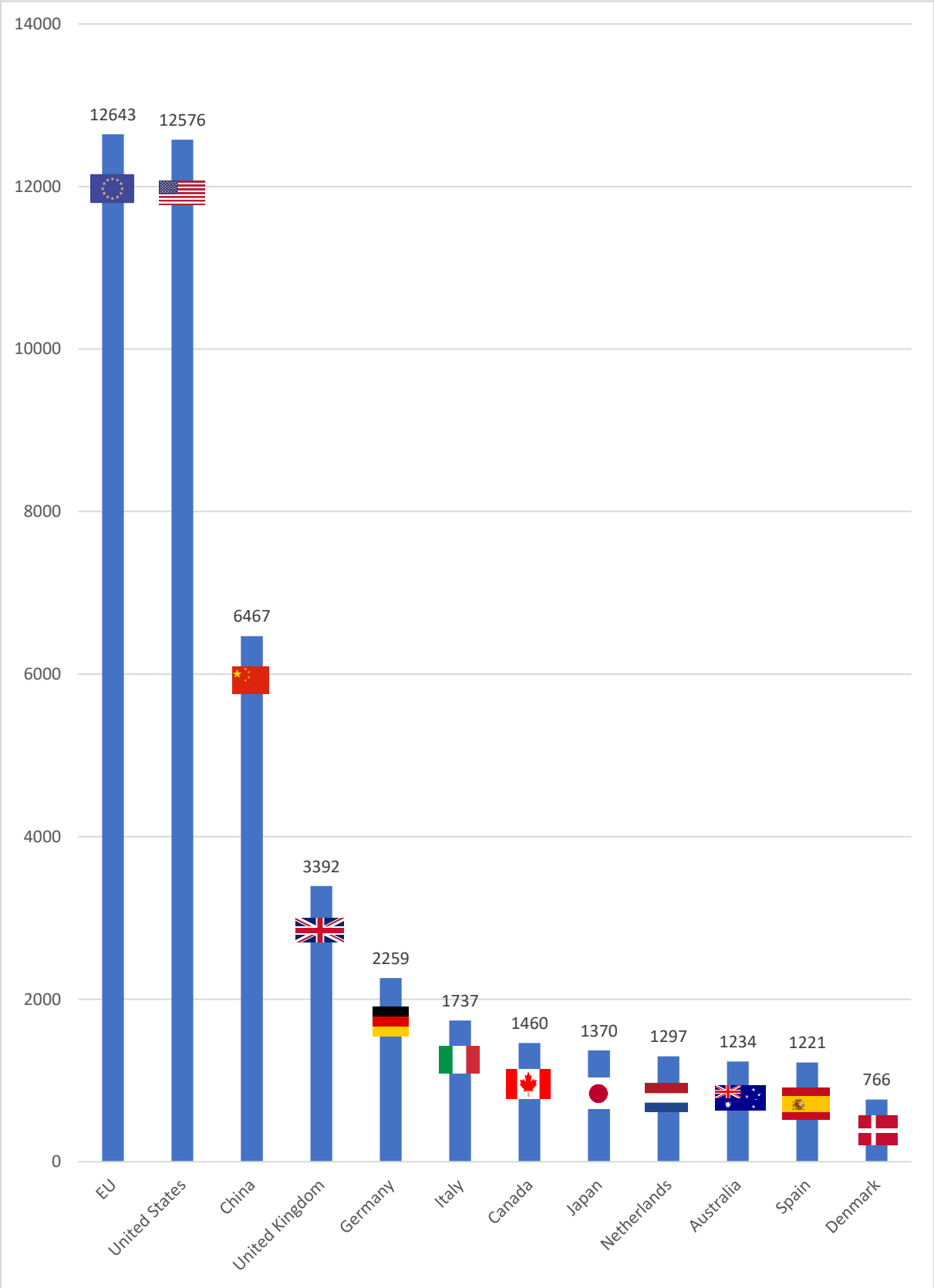


Figure 15 Personalized Medicine Technology for Cardiovascular Disease: Word Map - China

4.3.2 Countries



Graph 4 Personalized Medicine Technology for Cardiovascular Disease - Scholarly Output

4.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER

4.4.1 Word Maps

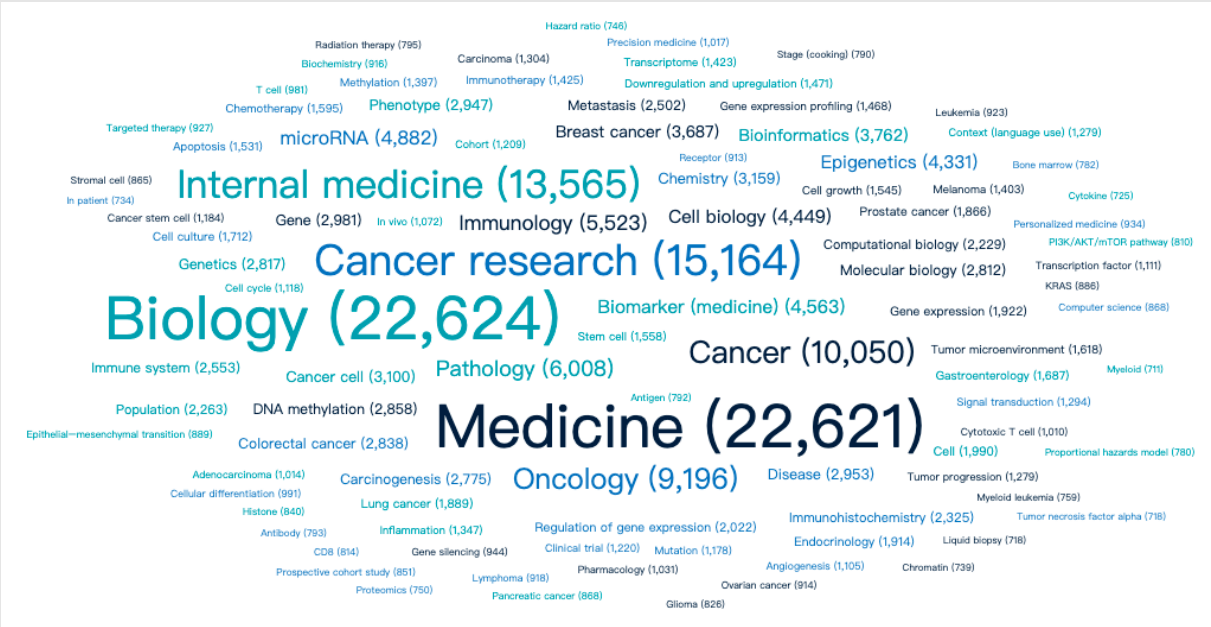


Figure 16 Personalized Medicine Technology for Cancer: Word Map - EU27

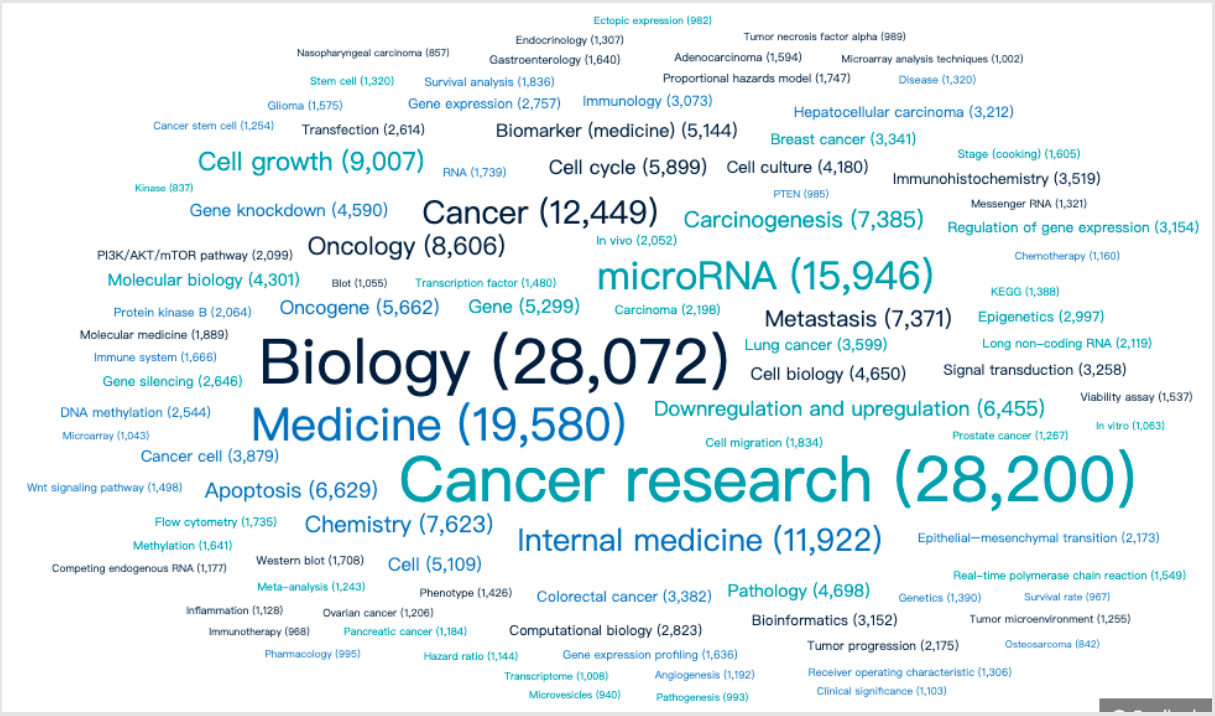
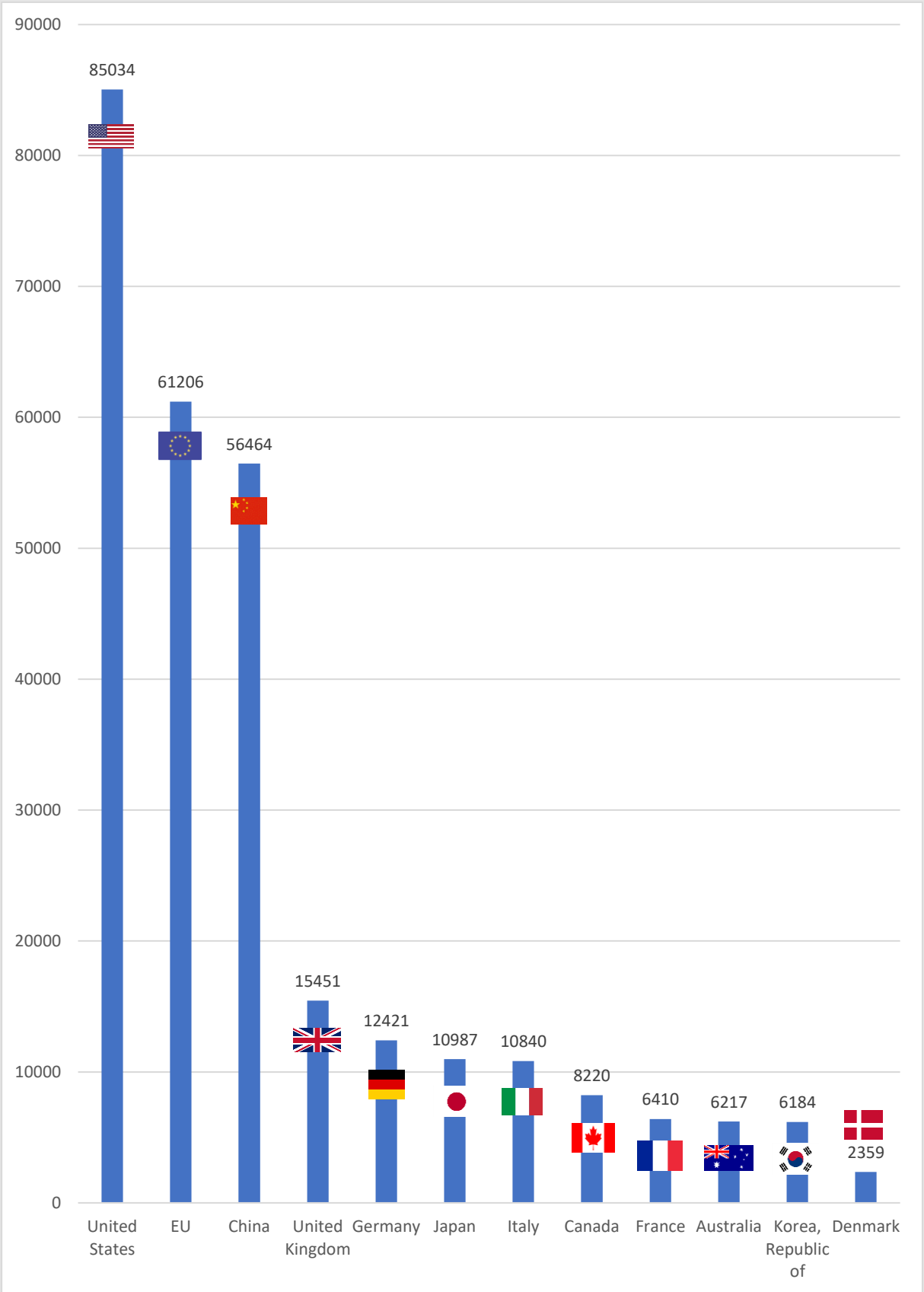


Figure 17 Personalized Medicine Technology for Cancer: Word Map - China

4.4.2 Countries



Graph 5 Personalized Medicine Technology for Cancer: Scholarly Output

4.5 MEDICAL IMAGING

4.5.1 Word Maps

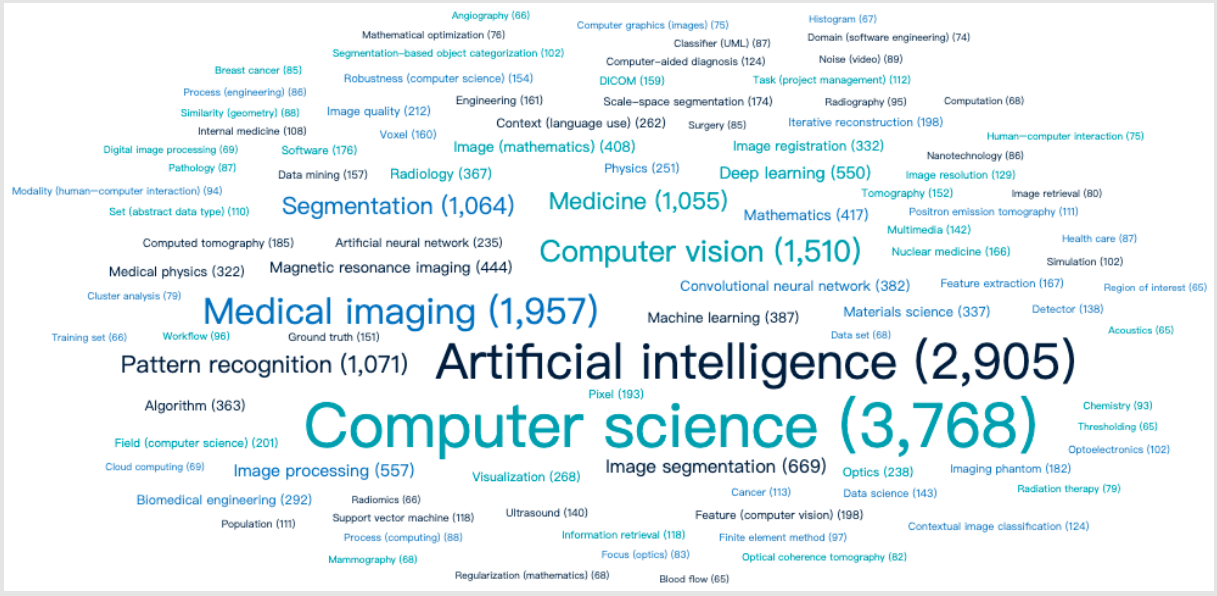


Figure 18 Medical Imaging: Word Map - EU27

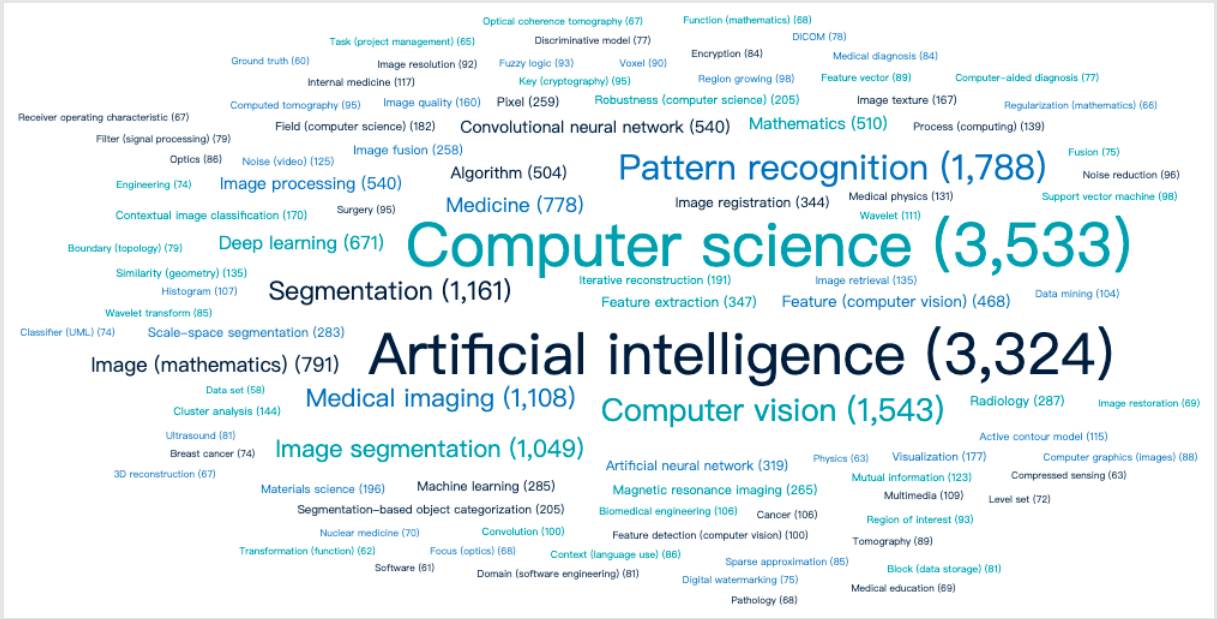
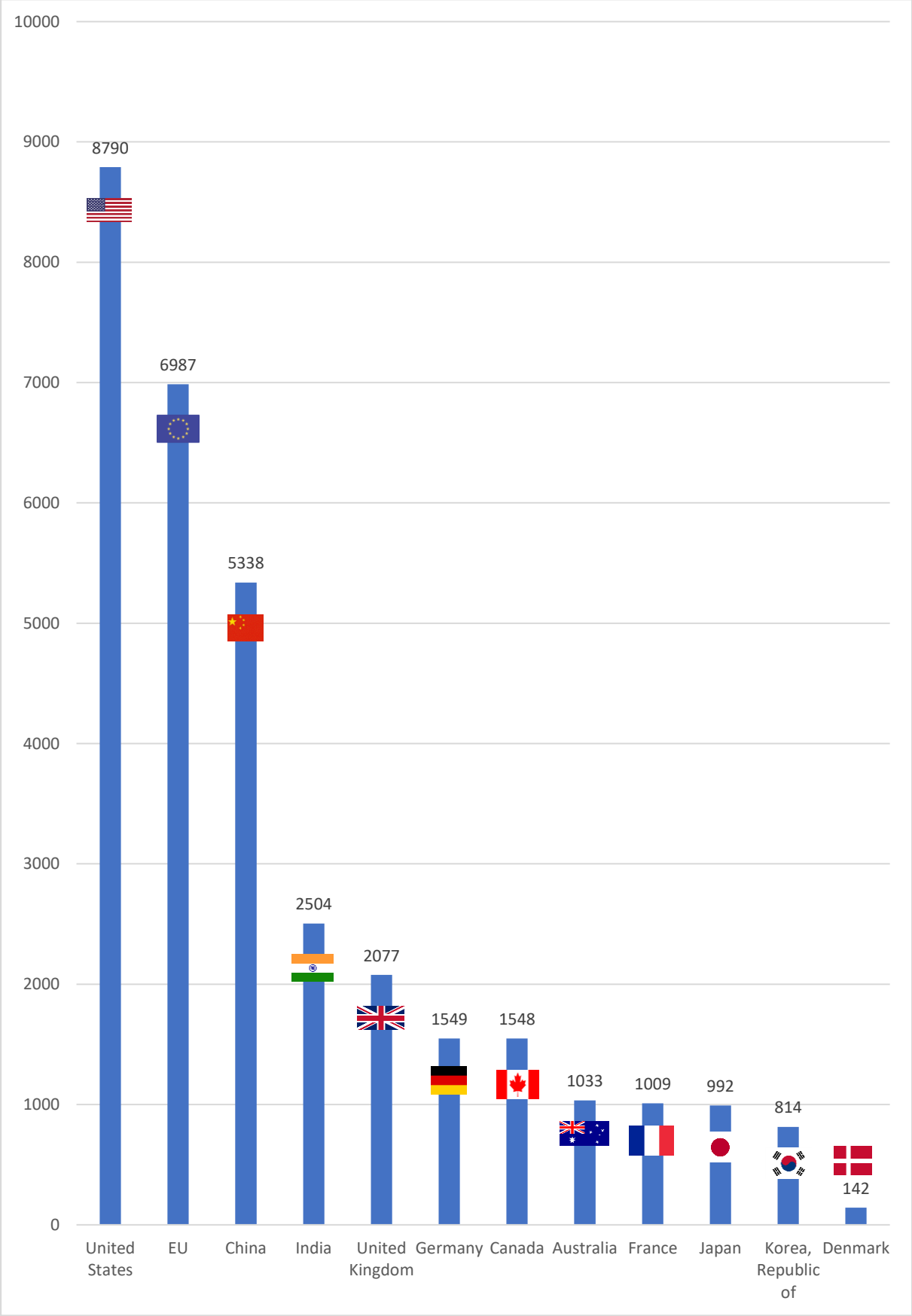


Figure 19 Medical Imaging: Word Map - China

4.5.2 Countries



Graph 6 Medical Imaging: Scholarly Output

4.6 TRADITIONAL CHINESE MEDICINE

4.6.1 Word Maps

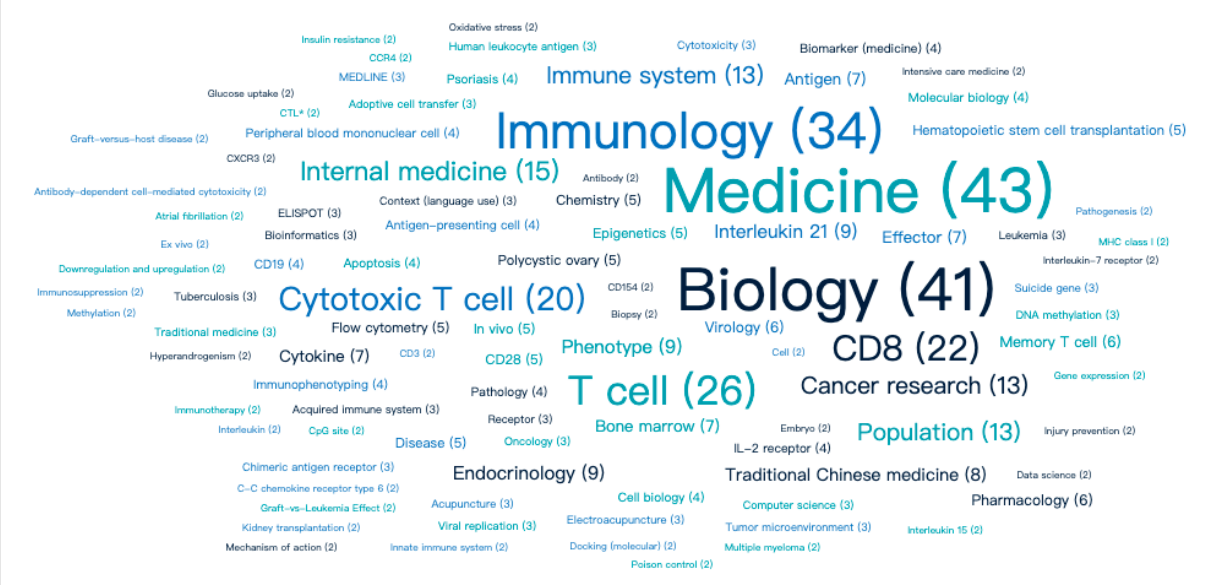
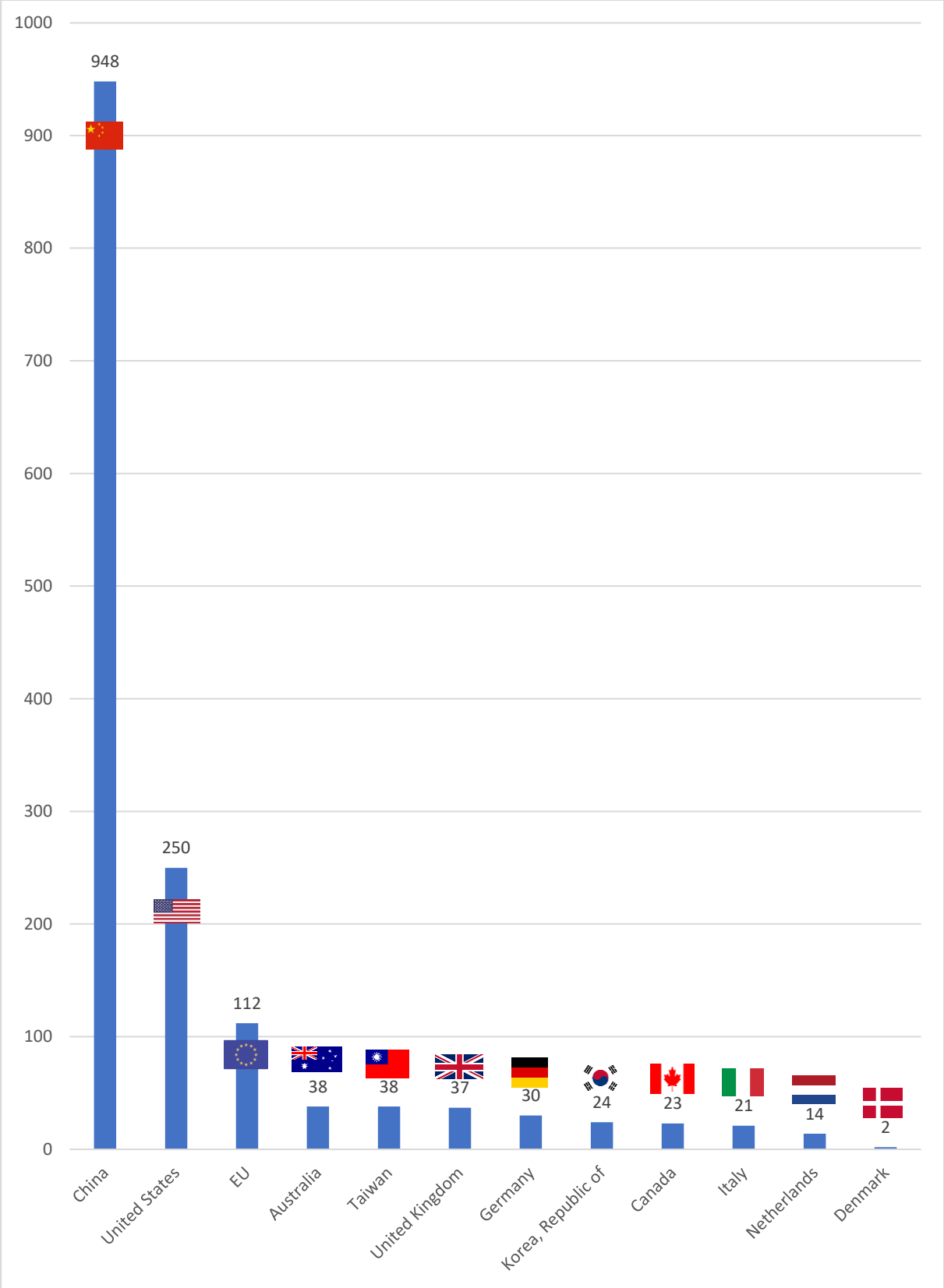


Figure 20 Traditional Chinese Medicine: Word Map - EU27

Figure 21 Traditional Chinese Medicine: Word Map - China

4.6.2 Countries

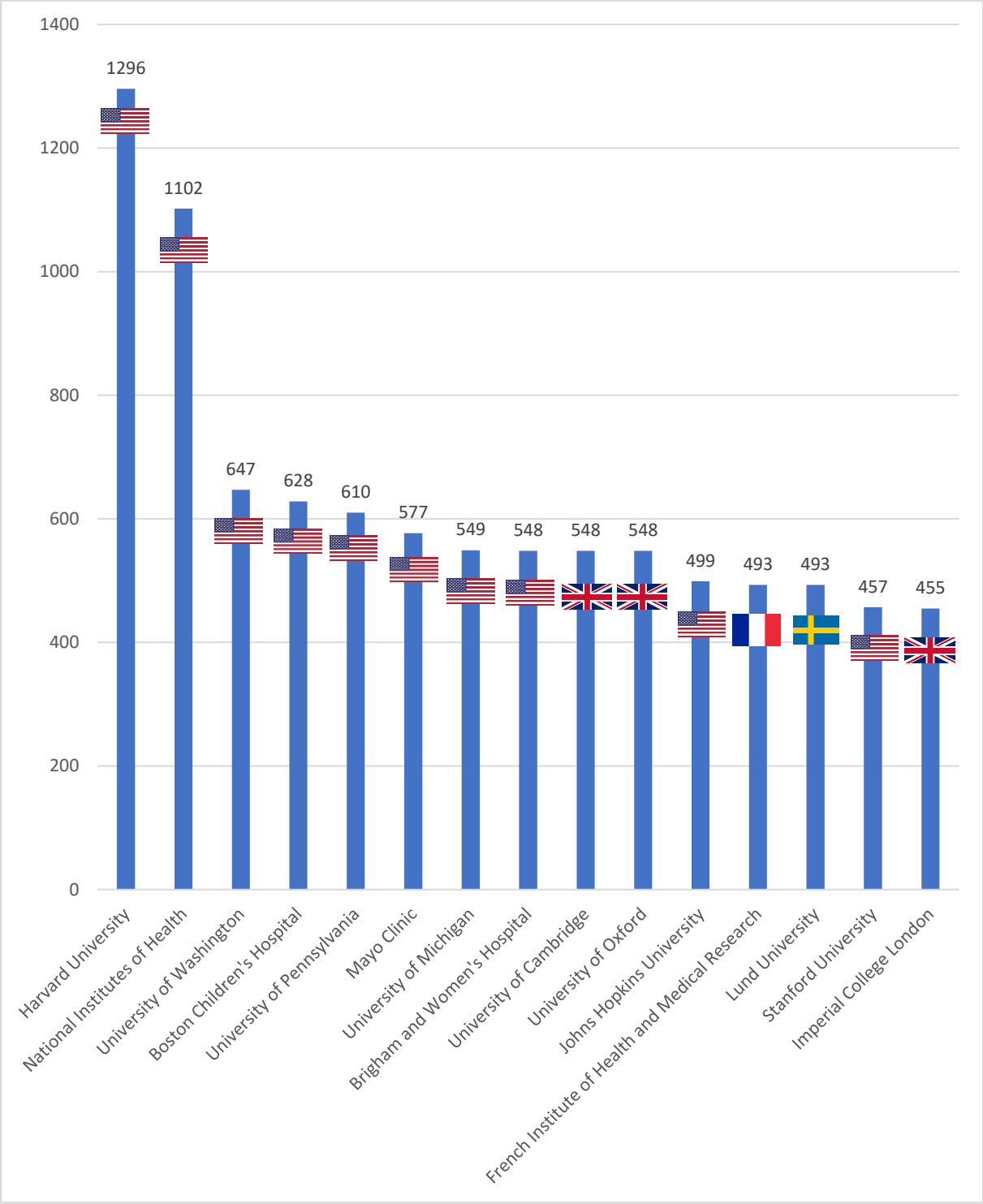


Graph 7 Traditional Chinese Medicine: Scholarly Output

PART 3: INSTITUTIONS

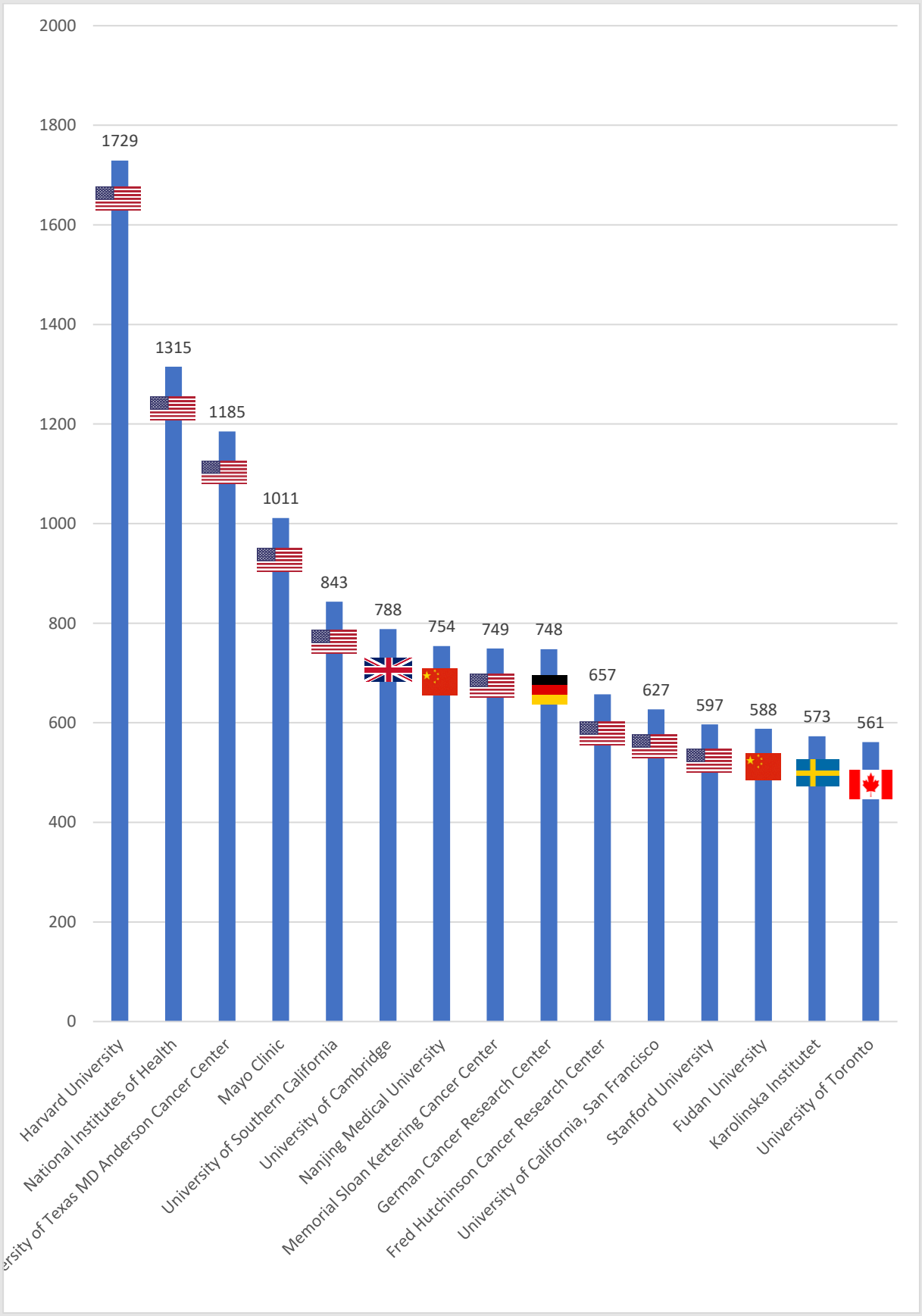
5 MAIN INSTITUTIONS PER SCHOLARLY OUTPUT 2011-2020

5.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE



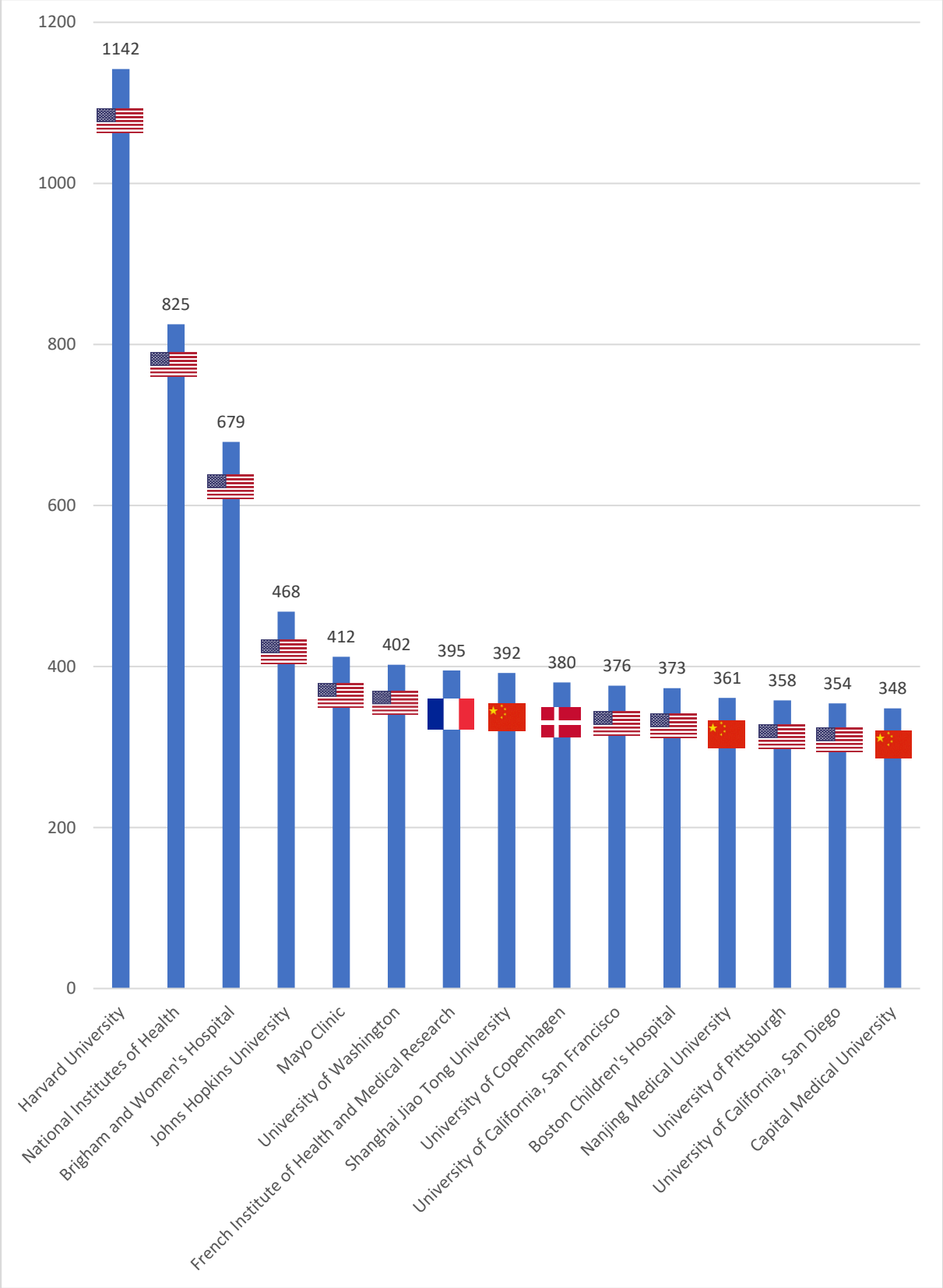
Graph 8 Genome Study for Cardiovascular Disease Scholarly Output (2011-2020): Institutions

5.2 GENOME STUDY FOR CANCER



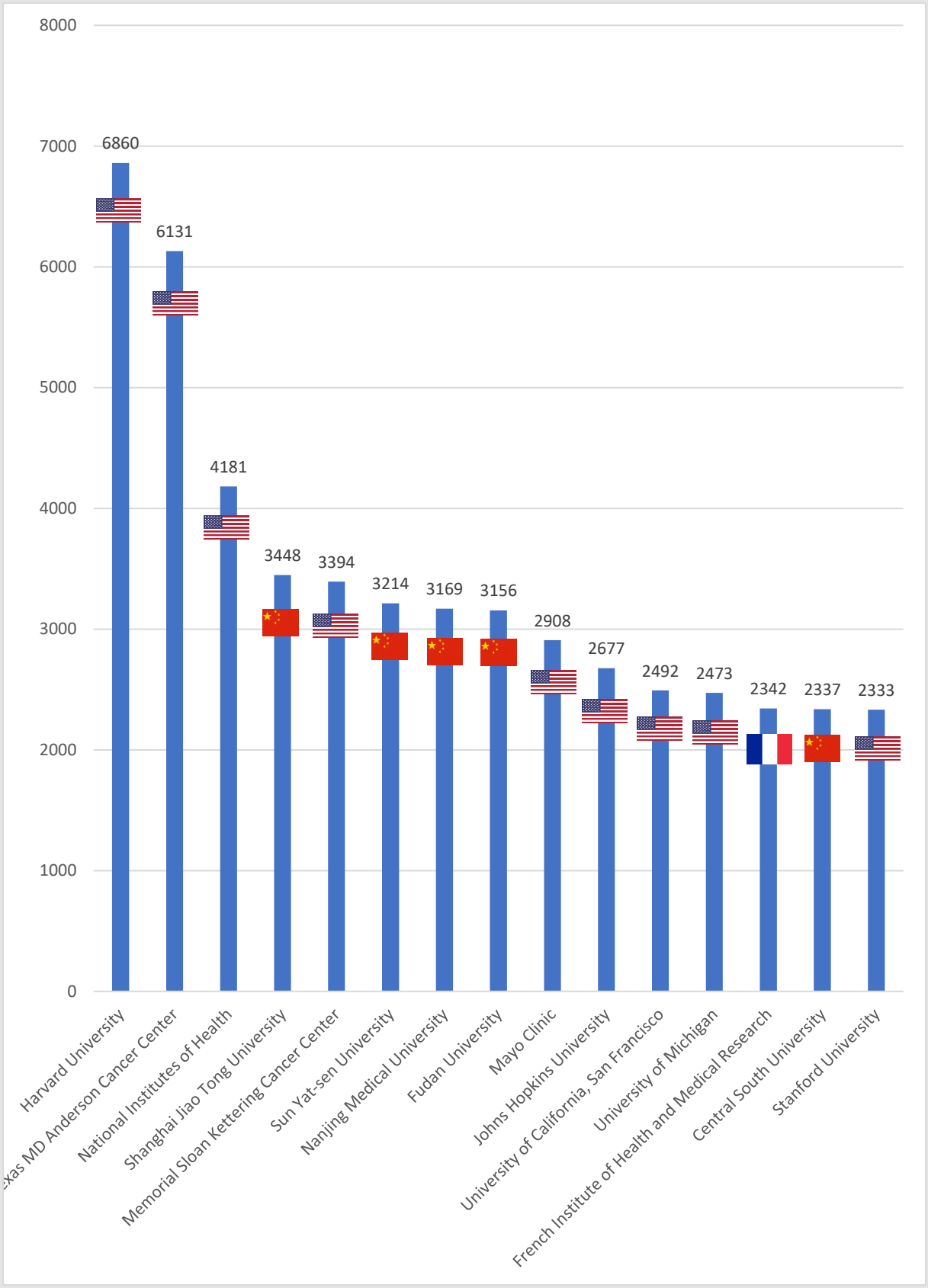
Graph 9 Genome Study for Cancer Scholarly Output (2011-2020): Institutions

5.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE



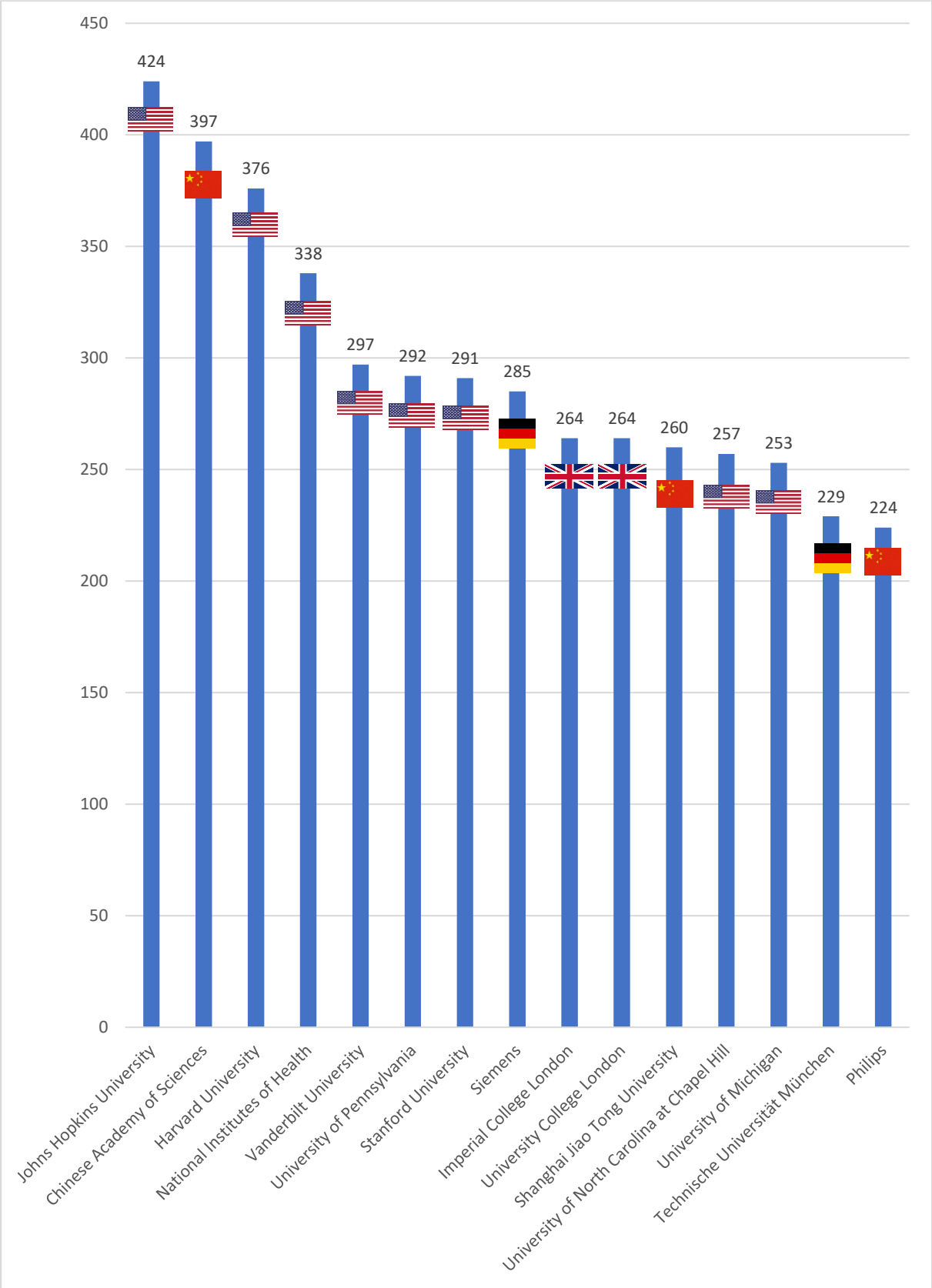
Graph 10 Personalized Medicine Technology for Cardiov. Disease Scholarly Output (2011-2020): Institutions

5.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER



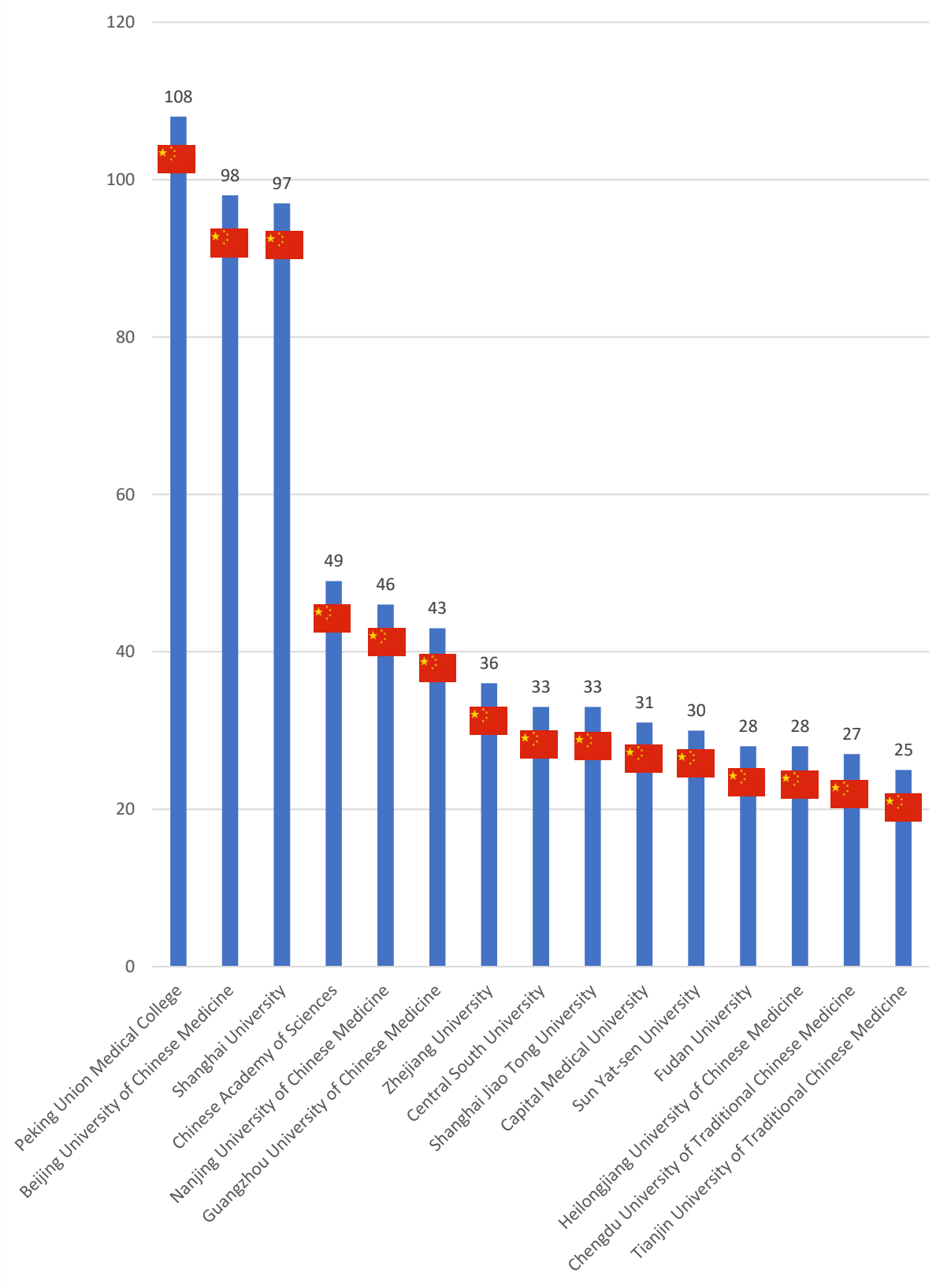
Graph 11 Personalized Medicine Technology for Cancer Scholarly Output (2011-2020): Institutions

5.5 MEDICAL IMAGING



Graph 12 Medical Imaging Scholarly Output (2011-2020): Institutions

5.6 TRADITIONAL CHINESE MEDICINE



Graph 13 Traditional Chinese Medicine Scholarly Output (2011-2020): Institutions

6 MAIN AUTHORS

6.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE

AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
Jerome I Rotter	Harbor – UCLA Medical Center	United States	183
Eric Boerwinkle	Harvard University	United States	170
Mark I McCarthy	University of Oxford	United Kingdom	158
Bruce M Psaty	University of Washington	United States	142
Leif Groop	Lund University	Sweden	120
Jose C Florez	Harvard University	United States	118
André G Uitterlinden	Erasmus University Rotterdam	The Netherlands	115
Nilesh J Samani	University of Leicester	United Kingdom	113
Albert Hofman	Erasmus University Rotterdam	The Netherlands	110
Stephen S Rich	University of Virginia	United States	105
Olle Melander	Lund University	Sweden	93
Sekar Kathiresan	Harvard University	United States	91
George Davey Smith	University of Bristol	United Kingdom	90
Barry I Freedman	Wake Forest University	United States	85
Nicholas J Wareham	University of Cambridge	United Kingdom	85
Carl D Langefeld	Wake Forest University	United States	82
Kent D Taylor	University of Washington	United States	80
Abbas Dehghan	Imperial College London	United Kingdom	78
Heribert Schunkert	Technische Universität Munchen	Germany	78
Braxton D Mitchell	University of Maryland	United States	75

Table 1 Genome Study for Cardiovascular Disease: Main Authors

6.2 GENOME STUDY FOR CANCER

AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
Stephen J Chanock	National Institutes of Health	United States	460
Wei Zheng	Vanderbilt University	United States	293
Christopher A Haiman	University of Southern California	United States	291
Paul D P Pharoah	University of Cambridge	United Kingdom	272
Douglas F Easton	University of Cambridge	United Kingdom	271
Jenny Chang-Claude	German Cancer Research Center	Germany	263
Graham G Giles	Cancer Council Victoria	Australia	256
Loic Le Marchand	University of Hawaii	United States	256
Christopher I Amos	University of Texas	United States	253
Qingyi Wei	Duke University	United States	252
Peter Kraft	Harvard University	United Kingdom	248
John L Hopper	University of Melbourne	Australia	215
Hermann Brenner	German Cancer Research Center	Germany	206
Xifeng Wu	University of Texas	United States	200
Sonja I Berndt	National Institutes of Health	United States	196
Georgia Chenevix-Trench	Queensland Institute of Medical Research	Australia	193
Melissa C Southey	University of Melbourne	Australia	179
Zhibin Hu	Nanjing Medical University	China	178
Peter A Fasching	Fredrich Alexander University	Germany	177
Hongbing Shen	Nanjing Medical University	China	174

Table 2 Genome Study for Cancer: Main Authors

6.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE

AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
James L Januzzi	Massachussets General Hospital	United States	133
Thomas Thum	Hannover Medical School	Germany	103
Ramachandran S Vasan	Boston University	United States	86
Wei Wang	Capital Medical University	China	84
Frank B Hu	Harvard School of Public Health	United States	82
Alan S Maisel	University of California	United States	78
Wolfgang Koenig	Ulm University	Germany	77
Stefan Blankenberg	University of Mainz	Germany	73
Tanja Zeller	University of Hamburg	Germany	70
Adriaan A Voors	University Medical Center Groningen	Netherlands	67
Faiez Zannad	Centre Hospitalier Universitaire de Nancy	France	58
Joan Montaner	Autonomous University of Barcelona	Spain	58
Harald Mischak	Mosaiques Diagnostics and Therapeutics AG	Germany	57
Mary Cushman	University of Vermont	United States	57
Agneta Siegbahn	Uppsala University	Sweden	53
Annette Peters	University of Düsserdolf	Germany	53
Lars Wallentin	Uppsala Universitet	Sweden	53
Daniel Levy	National Institutes of Health	United States	52
Michael G Shlipak	University of California	United States	52
Chirag R Parikh	Yale University	United States	51

Table 3 Personalized Medicine Technology for Cardiovascular Disease: Main Authors

6.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER

AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
Wei Zhang	Nanjing Medical University	China	804
Wei Wang	Sun Yat-sen University	China	636
Jing Wang	University of Texas	United States	597
Wei Li	Jilin University	China	551
Yan Wang	China Medical University	China	465
Lei Wang	Fudan University	China	446
Yan Li	China Medical University	China	445
Jing Li	Harbin Medical University	China	439
Yan Zhang	Harbin Medical University	China	438
Yang Liu	Harbin Medical University	China	436
Jing Zhang	Shanghai Jiao Tong University	China	416
Li Li	Guangxi Medical University	China	415
Li Zhang	Sun Yat-sen University	China	410
Jun Li	Anhui Medical University	China	409
Lei Zhang	Fudan University	China	407
Yi Zhang	Zhengzhou University	China	397
Wei Chen	Xi'an Jiao Tong University	China	384
Jeffrey S Ross	Mayo Clinic	United States	371
Li Wang	Shanghai Jiao Tong University	China	368
Jun Wang	Nanjing Medical University	China	365

Table 4 Personalized Medicine Technology for Cancer: Main Authors

6.5 MEDICAL IMAGING

AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
Ronald M Summers	National Institutes of Health	United States	128
Daniel Rueckert	Technical University of Munich	Germany	123
Bennett A Landman	Vanderbilt University	United States	122
Nassir Navab	Technical University of Munich	Germany	106
Henning Müller	University of Geneva	Switzerland	103
Dinggang Shen	ShanghaiTech University	China	95
Kensaku Mori	Nagoya University	Japan	93
Jerry L Prince	John Hopkins University	United States	88
Gabor Fichtinger	Queen's University	Canada	79
Sebastien Ourselin	King's College London	United Kingdom	77
Le Lu	Alibaba Group DAMO Academy	United States	74
Anant Madabhushi	Case Western Reserve University	United States	68
Yen-Wei Chen	Ritsumeikan University	Japan	64
Carlos Costa	University of Aveiro	Portugal	60
Terry M Peters	University of Western Ontario	Canada	59
Heang Ping Chan	University of Michigan	United States	58
Aaron Carass	John Hopkins University	United States	57
Andreas Maier	University of Erlangen-Nuremberg	Germany	56
Jayaram K Udupa	University of Pennsylvania	United States	54
Lubomir M Hadjiiski	University of Michigan	United States	54

Table 5 Medical Imaging: Main Authors

6.6 TRADITIONAL CHINESE MEDICINE

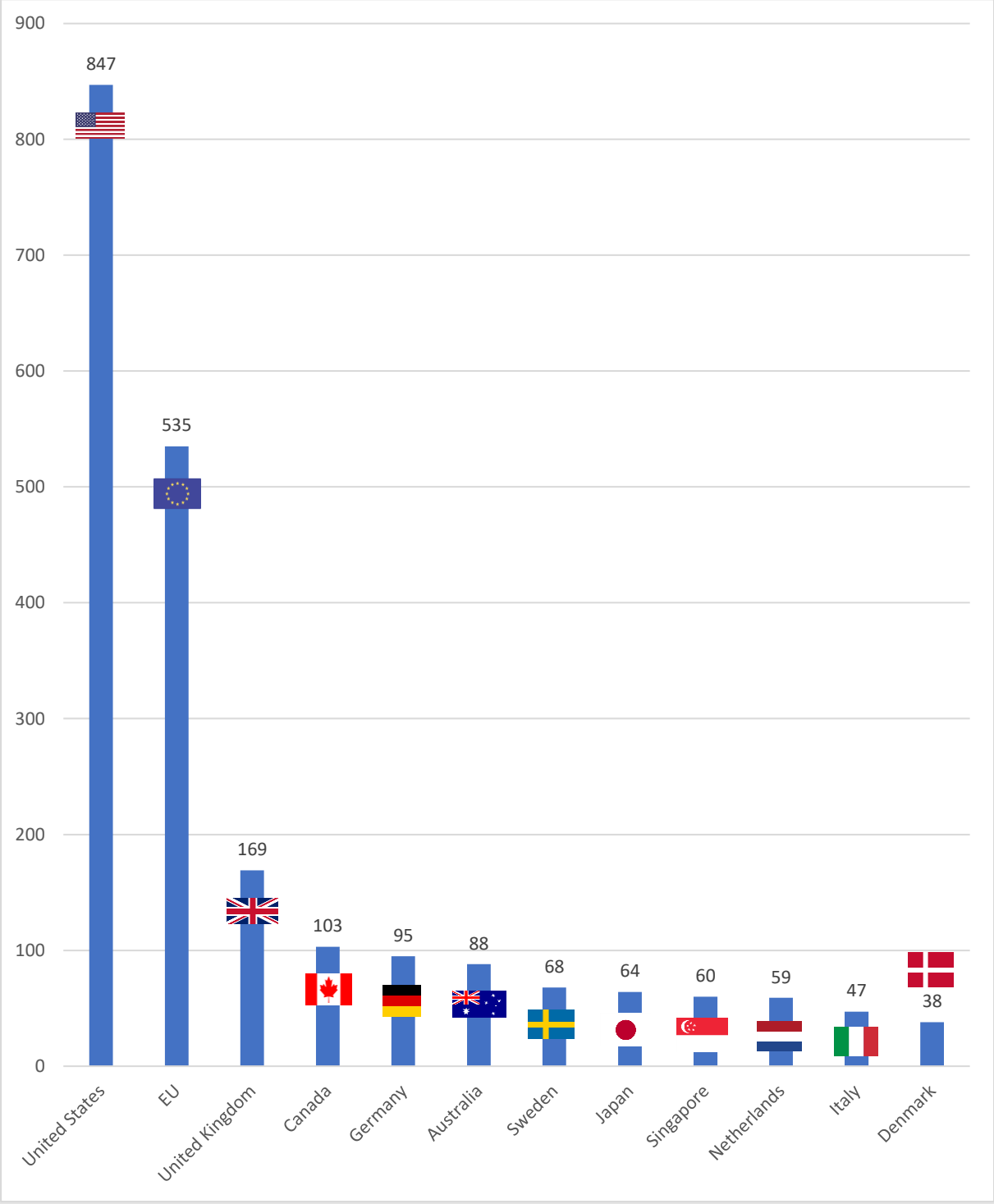
AUTHOR	AFFILIATION	COUNTRY / REGION	SCHOLARLY OUTPUT
Aihua Zhang	Heilongjiang University of Chinese Medicine	China	22
Hui Sun	Heilongjiang University of Chinese Medicine	China	21
Wei Wang	Beijing University of Chinese Medicine	China	16
Aiping Lu	Hong Kong Baptist University	China	15
Xijun Wang	Heilongjinag University of Chinese Medicine	China	13
Jie Wang	Peking Union Medical College	China	10
Jiarui Wu	Beijing University of Chinese Medicine	China	9
Jin-Ao Duan	Nanjing University of Chinese Medicine	China	9
Jing Wang	Shanghai University of Traditional Chinese Medicine	China	9
Li Zhang	Nanjing University of Chinese Medicine	China	9
Cheng Lu	Peking Union Medical College	China	8
Ji-Cheng Li	Zhejiang University	China	8
Jianxin Chen	Beijing University of Chinese Medicine	China	8
Yi Zhang	Peking Union Medical College	China	8
Chang-Ming Liu	Zhejiang University	China	7
Cun-Zhi Liu	Beijing University of Chinese Medicine	China	7
Guanhua Du	Peking Union Medical College	China	7
Hanjin Cui	Central South University	China	7
Attilio Bondanza	Vita-Salute San Raffaele University	Italy	6
Baoyan Liu	Beijing Jiaotong University	China	6

Table 6 Traditional Chinese Medicine: Main Authors

PART 4: SCIENTIFIC COLLABORATION (SOURCE LENS)

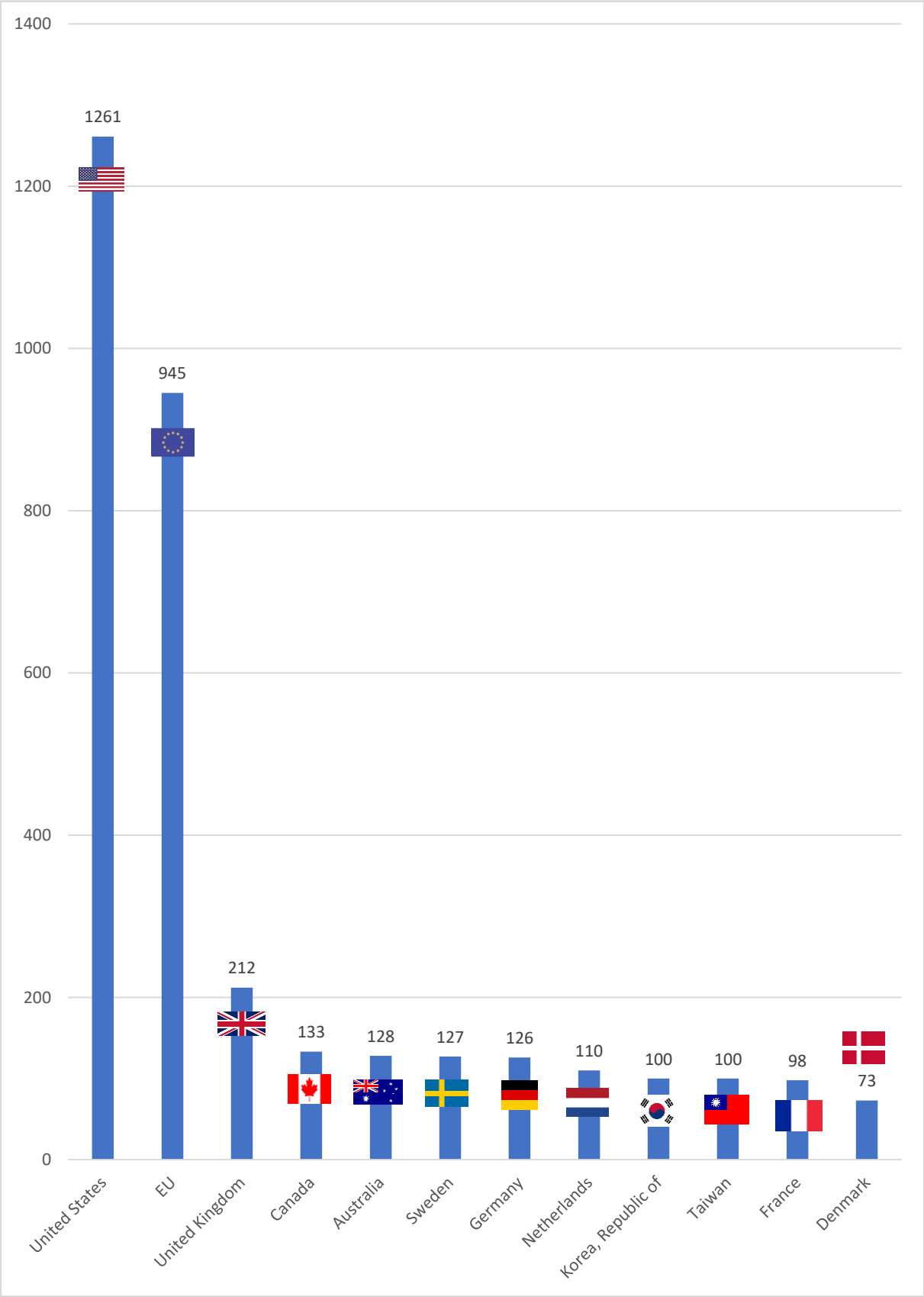
7 TOP COLLABORATING COUNTRIES + EU + DK

7.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE



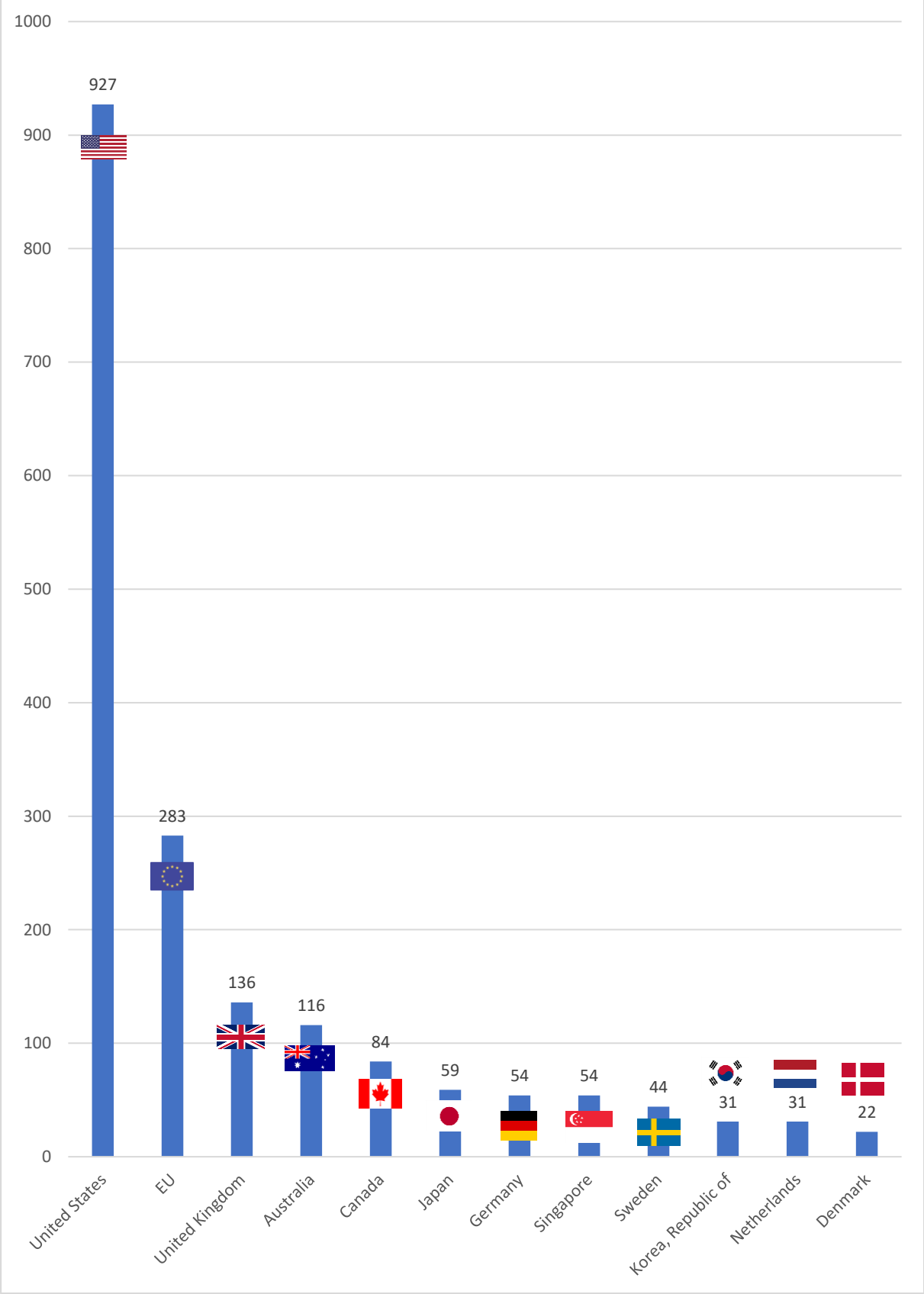
Graph 14 Genome Study for Cardiovascular Disease: International Collaboration

7.2 GENOME STUDY FOR CANCER



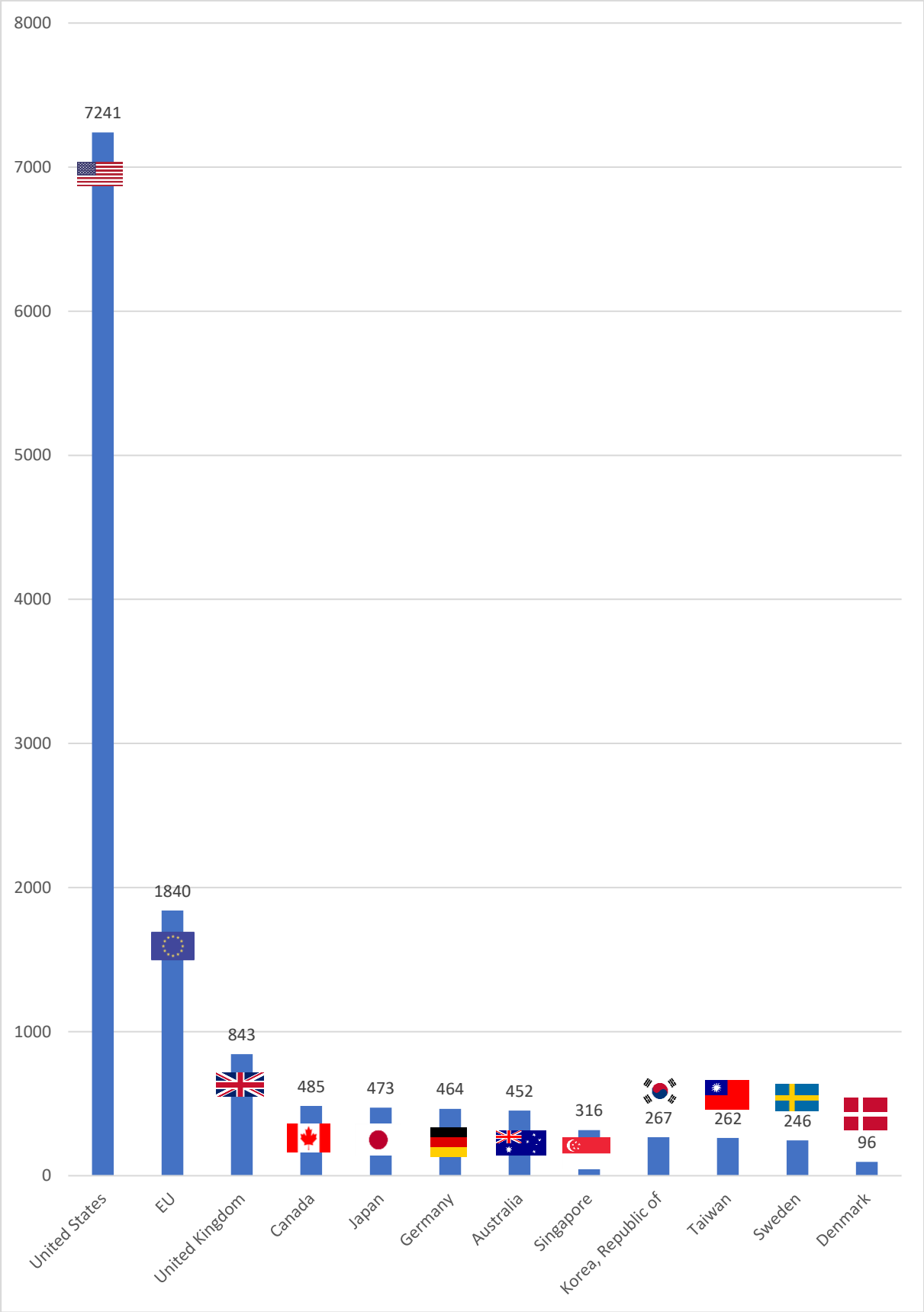
Graph 15 Genome Study for Cancer: International Collaboration

7.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE



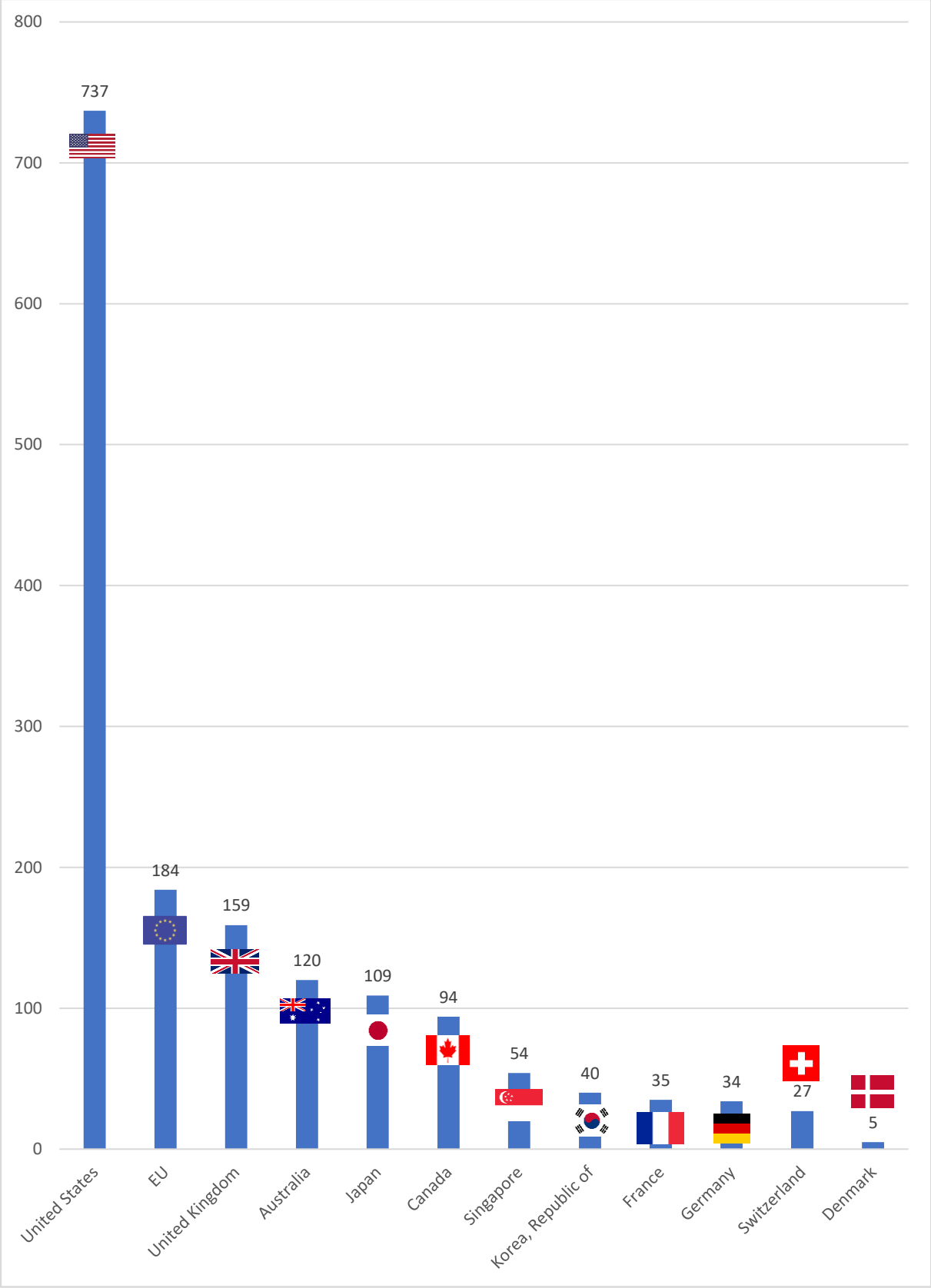
Graph 16 Personalized Medicine Technology for Cardiovascular Disease: International Collaboration

7.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER



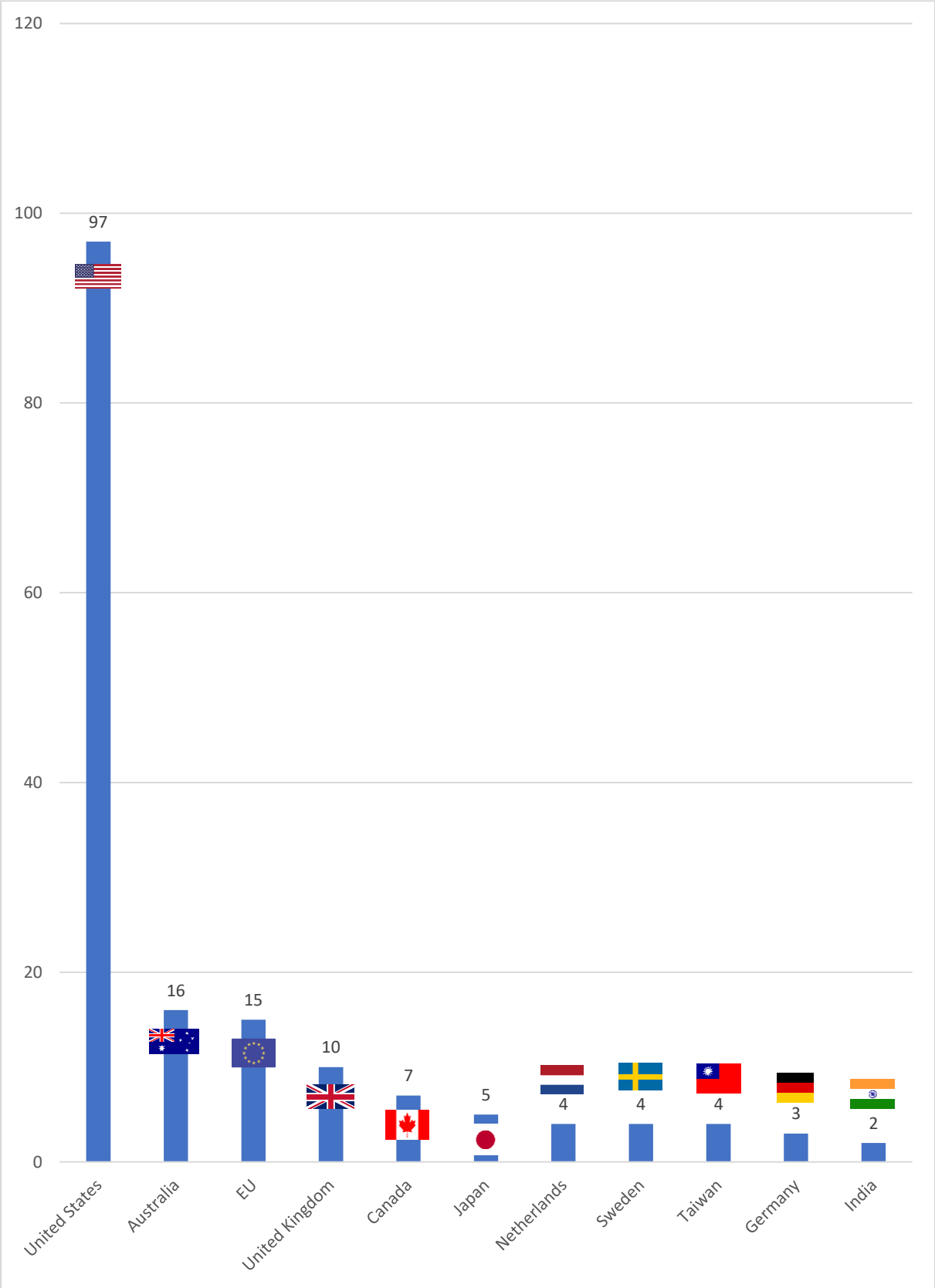
Graph 17 Personalized Medicine Technology for Cancer: International Collaboration

7.5 MEDICAL IMAGING



Graph 18 Medical Imaging: International Collaboration

7.6 TRADITIONAL CHINESE MEDICINE



Graph 19 Traditional Chinese Medicine: International Collaboration

8 INTERNATIONAL COLLABORATION TOP 10 COUNTRIES + EU27 + DK

8.1 AMOUNTS PER SUB-DOMAIN 2011-2020

8.1.1 Genome Study for Cardiovascular Disease

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	847
EU	535
United Kingdom	169
Canada	103
Germany	95
Australia	88
Sweden	68
Japan	64
Singapore	60
Netherlands	59
Italy	47
Denmark	38

8.1.1.1 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
Germany	95
Sweden	68
Netherlands	59
Italy	47
Denmark	38

8.1.2 Genome Study for Cancer

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	1261
EU	945
United Kingdom	212
Canada	133
Australia	128
Sweden	127
Germany	126
Netherlands	110
Korea, Republic of	100
Taiwan	100
France	98
Denmark	73

8.1.2.1 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
Sweden	127
Germany	126
Netherlands	110
France	98
Denmark	73

8.1.3 Personalized Medicine Technology for Cardiovascular Disease

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	927
EU	283
United Kingdom	136
Australia	116
Canada	84
Japan	59
Germany	54
Singapore	54
Sweden	44
Korea, Republic of	31
Netherlands	31
Denmark	22

8.1.3.1 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
Germany	54
Sweden	44
Netherlands	31
Italy	23
Denmark	22

8.1.4 Personalized Medicine Technology for Cancer

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	7241
EU	1840
United Kingdom	843
Canada	485
Japan	473
Germany	464
Australia	452
Singapore	316
Korea, Republic of	267
Taiwan	262
Sweden	246
Denmark	96

8.1.4.1 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
Germany	464
Sweden	246
Netherlands	187
France	174
Italy	168

8.1.5 Medical Imaging

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	737
EU	184
United Kingdom	159
Australia	120
Japan	109
Canada	94
Singapore	54
Korea, Republic of	40
France	35
Germany	34
Switzerland	27
Denmark	5

8.1.6 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
France	35
Germany	34
Netherlands	21
Italy	18
Spain	14

8.1.7 Traditional Chinese Medicine

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
United States	97
Australia	16
EU	15
United Kingdom	10
Canada	7
Japan	5
Netherlands	4
Sweden	4
Taiwan	4
Germany	3
India	2

8.1.8 Top 5 EU Countries

PARTNER COUNTRY	JOINT PUBLICATIONS (2011-2020)
Netherlands	4
Sweden	4
Germany	3
Austria	1
Belgium	1

9 TOP 5 INTERNATIONALLY ACTIVE INSTITUTES / UNIVERSITIES

9.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE

INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
Shanghai Jiao Tong University	391	Harvard University	22
		National University of Singapore	18
		Tulane University	14
		University of North Carolina at Chapel Hill	12
		University of Oxford	12
Peking University	258	Harvard University	17
		University of Michigan	16
		University of Oxford	15
		National University of Singapore	12
		Brigham and Women's Hospital	10
Nanjing Medical University	235	Boston Children's Hospital	6
		University of Colorado Denver	4
		Harvard University	3
		Georgia Regents University	2
Capital Medical University	217	Edith Cowan University	9
		Harvard University	7
		University of Pittsburgh	7
		Imperial College London	6
		National University of Singapore	6
Fudan University	206	Boston Children's Hospital	11
		Harvard University	8
		Karolinska Institutet	8
		University of Pittsburgh	7
		National University of Singapore	6

9.2 GENOME STUDY FOR CANCER

INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
Nanjing Medical University	753	Harvard University	42
		National Institutes of Health	38
		University of Texas MD Anderson Cancer Center	36
		Dartmouth College	28
		Vanderbilt University	25
Fudan University	583	University of Texas MD Anderson Cancer Center	40
		Duke University	38
		Vanderbilt University	38
		Harvard University	33
		National Institutes of Health	32
Shanghai Jiao Tong University	431	Vanderbilt University	22
		Harvard University	20
		University of Texas MD Anderson Cancer Center	20
		Duke University	19
		National Institutes of Health	14
China Medical University (PRC)	322	National Health Research Institutes	15
		National University of Singapore	14
		Vanderbilt University	12
		National Institutes of Health	11
		Kyungpook National University	10

Sun Yat-sen University	320	National Institutes of Health	21
		Vanderbilt University	17
		Harvard University	13
		National University of Singapore	13
		University of Southern California	11

9.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE

INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
Shanghai Jiao Tong University	389	Harvard University	8
		Icahn School of Medicine at Mount Sinai	6
		Imperial College London	6
		National University of Singapore	6
		Baker IDI Heart and Diabetes Institute	5
Nanjing Medical University	353	Harvard University	6
		Emory University	4
		East Tennessee State University James H. Quillen College of Medicine	2
		National Institutes of Health	2
		Temple University	2
Capital Medical University	347	Edith Cowan University	18
		Harvard University	9
		University of Zagreb	7
		Wayne State University	7
		University of Pittsburgh	5
Central South University	288	University of Pittsburgh	7
		Georgia Regents University	5
		University of California, Davis	5
		Charlie Norwood VA Medical Center	4
		Boston Children's Hospital	3
Fudan University	276	National University of Singapore	6
		National Institutes of Health	5
		Medical College of Wisconsin	4
		University of Sydney	4
		Boston Children's Hospital	3

9.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER

INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
Shanghai Jiao Tong University	3417	University of Texas MD Anderson Cancer Center	56
		Harvard University	35
		University of Pittsburgh	27
		University of Michigan	26
		Boston Children's Hospital	24
Sun Yat-sen University	3210	University of Texas MD Anderson Cancer Center	66
		Harvard University	34
		National University of Singapore	32
		Memorial Hospital of South Bend	26
		University of Illinois at Chicago	22
Fudan University	3139	University of Texas MD Anderson Cancer Center	64
		Harvard University	42
		National Institutes of Health	25
		Boston Children's Hospital	24
		University of California, San Diego	24
Nanjing Medical University	3129	University of Texas MD Anderson Cancer Center	35
		Harvard University	30
		Boston Children's Hospital	18
		Thomas Jefferson University	15
		University of Pittsburgh	13

Central South University	2323	University of Minnesota	24
		University of Pittsburgh	23
		University of Texas MD Anderson Cancer Center	21
		Cleveland Clinic Lerner Research Institute	19
		Houston Methodist Hospital	18

9.5 MEDICAL IMAGING

INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
CAS	396	Hebrew University of Jerusalem	8
		Institut Eurécom	7
		Laboratoire des Sciences du Numérique de Nantes	7
		University College London	7
		University of British Columbia	7
Shanghai Jiao Tong University	260	University of Sydney	23
		University of North Carolina at Chapel Hill	17
		Royal Prince Alfred Hospital	10
		Korea University	6
		Stanford University	6
Tsinghua University	165	Stony Brook University	7
		Imperial College London	6
		Microsoft	5
		Duke University	4
		Brigham and Women's Hospital	3
Zhejiang University	140	Ritsumeikan University	24
		Harvard University	6
		University of Notre Dame	6
		Yamaguchi University	6
		Microsoft	3
The Chinese University of Hong Kong	141	Stanford University	8
		University of Florida	6
		Imperial College London	4
		Johns Hopkins University	4
		Stony Brook University	4

9.6 TRADITIONAL CHINESE MEDICINE

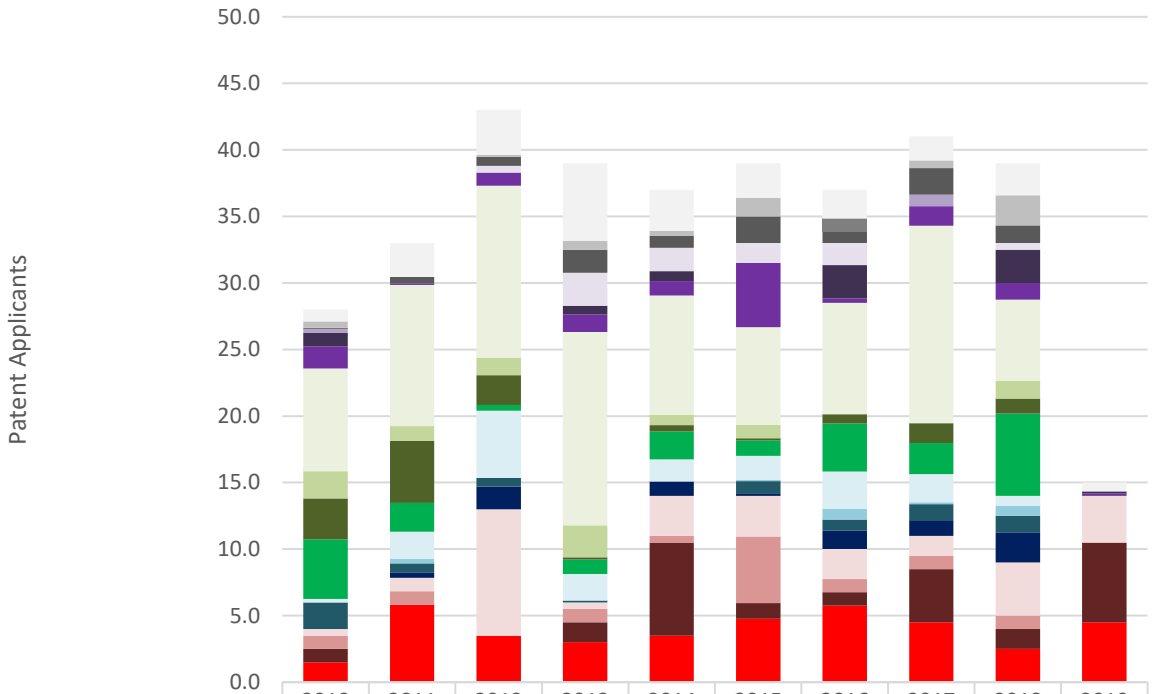
INSTITUTE/UNIVERSITY	PUBLICATIONS 2011-2020	MAIN PARTNERS	
Shanghai University	97	Emory University	2
		Georgia Regents University	2
		University of Hawaii	2
		University of Kansas	2
		University of North Texas Health Science Center	2
Beijing University of Chinese Medicine	89	University of California, Los Angeles	2
		Beth Israel Deaconess Medical Center	1
		Department of Clinical Microbiology Hospital of Southern Jutland Sonderborg Denmark	1
		Harvard University	1
		Los Angeles Biomedical Research Institute	1
Peking Union Medical College	81	University of Bradford	3
		University of Louisville	2
CAS	49	City University of New York	1
		Cleveland Clinic Lerner Research Institute	1
		Department of Psychiatry and Psychotherapy, University Medical Center, Georg-August-Universitat, Gottingen, Germany.	1
		Edith Cowan University	1
		Gandhi Institute of Technology and Management	1
Central South University	33	Denison University	1
		Department of Psychiatry and Psychotherapy, University Medical Center, Georg-August-Universitat, Gottingen, Germany.	1
		University of Illinois at Chicago	1

PART 5: PATENTS (SOURCE: LENSE)

10 PATENT APPLICATIONS PER YEAR: 2011-2019

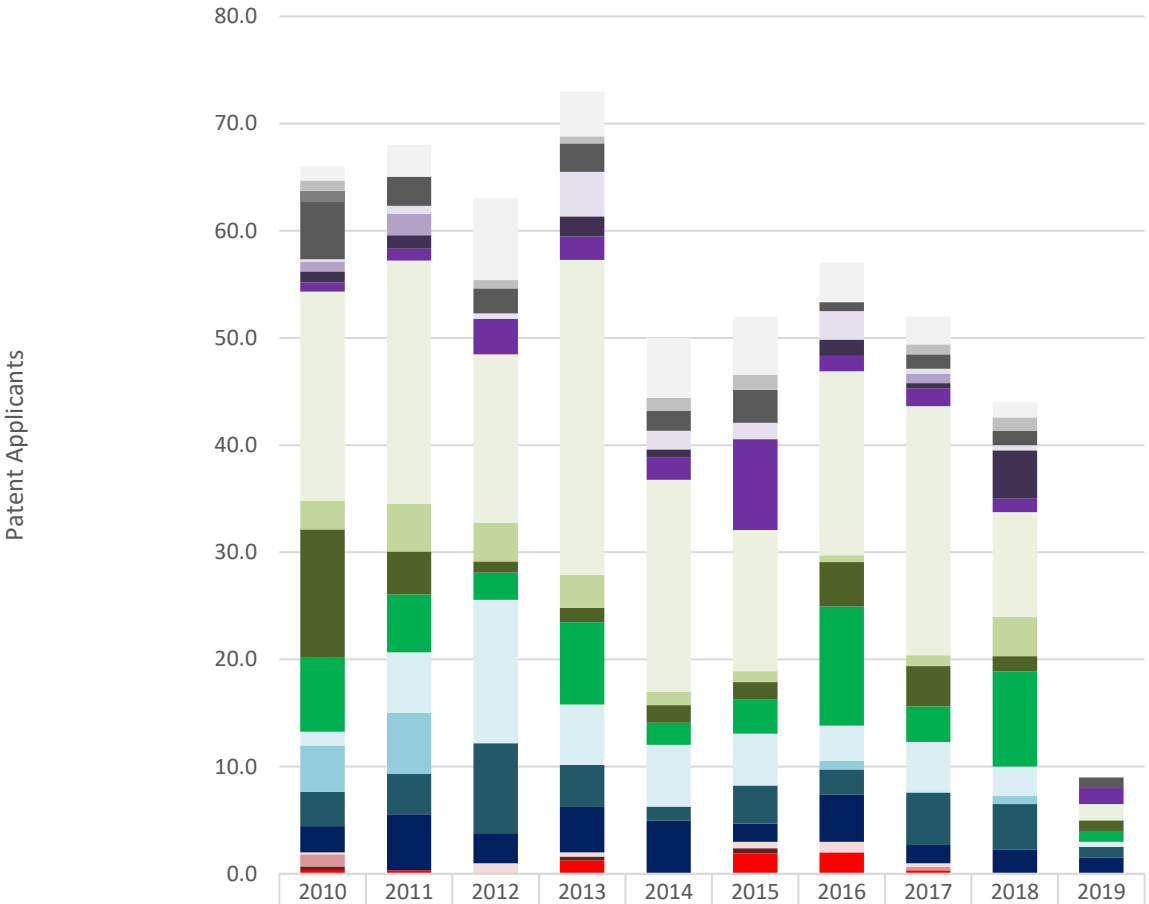
10.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE

10.1.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



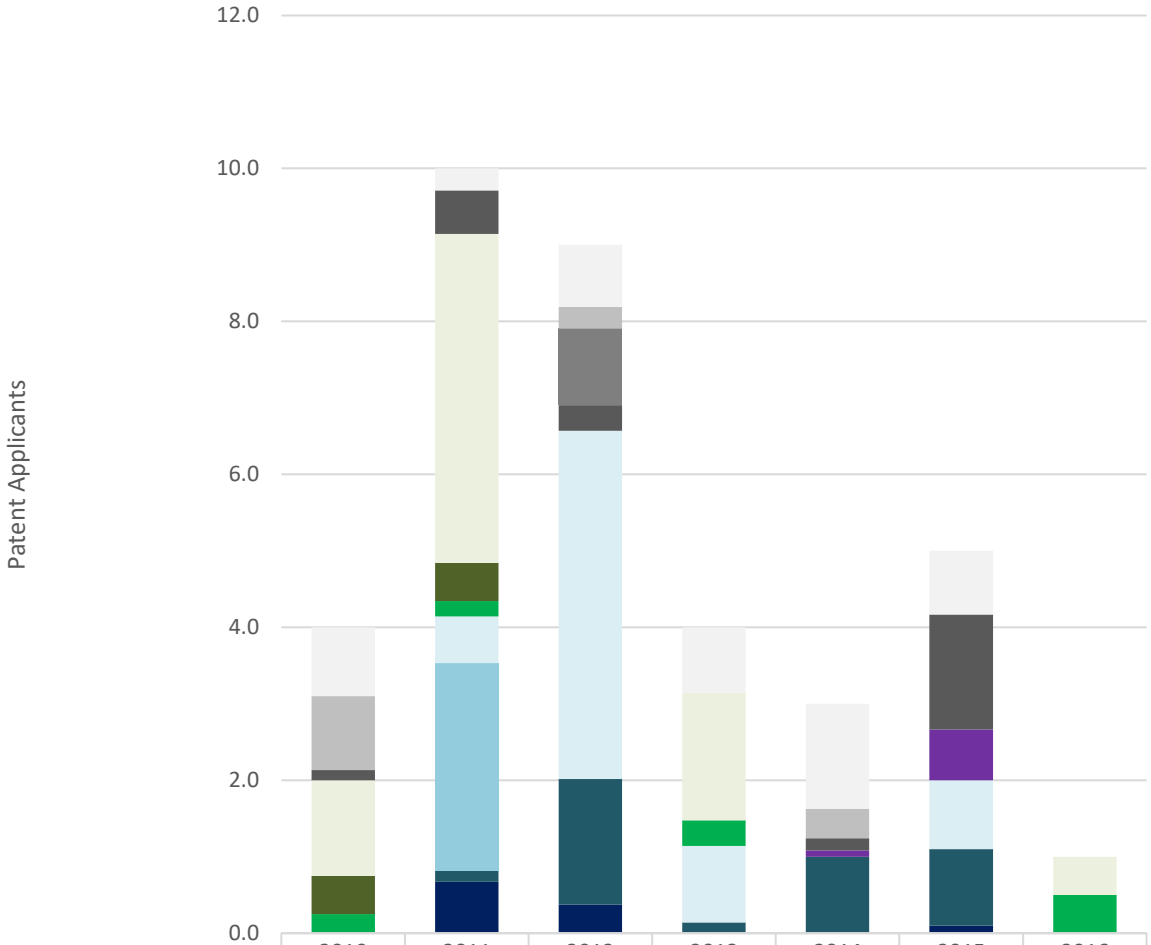
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	0.9	2.5	3.4	5.8	3.1	2.6	2.2	1.8	2.4	0.7
Unknown Individual	0.5	0.0	0.1	0.7	0.4	1.4	0.0	0.6	2.3	0.0
Unknown Academia	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Unknown Company	0.1	0.5	0.7	1.8	0.9	2.0	0.8	2.0	1.3	0.0
Rest of World Unknown	0.0	0.0	0.5	2.5	1.8	1.5	1.7	0.0	0.5	0.0
Rest of World Individual	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Rest of World Academia	1.0	0.0	0.0	0.7	0.8	0.0	2.5	0.0	2.5	0.2
Rest of World Company	1.7	0.1	1.0	1.3	1.1	4.8	0.3	1.5	1.3	0.2
American Unknown	7.7	10.6	12.9	14.5	9.0	7.3	8.4	14.8	6.1	0.0
American Individual	2.0	1.1	1.3	2.4	0.8	1.0	0.0	0.0	1.3	0.0
American Academia	3.1	4.7	2.3	0.2	0.5	0.2	0.7	1.5	1.1	0.0
American Company	4.5	2.2	0.4	1.1	2.1	1.2	3.6	2.3	6.2	0.0
EU-27 Unknown	0.3	2.0	5.1	2.0	1.7	1.8	2.8	2.1	0.8	0.0
EU-27 Individual	0.0	0.3	0.0	0.0	0.0	0.1	0.8	0.1	0.8	0.0
EU-27 Academia	2.0	0.7	0.6	0.1	0.0	0.9	0.8	1.2	1.3	0.0
EU-27 Company	0.0	0.4	1.7	0.0	1.1	0.2	1.4	1.2	2.3	0.0
Chinese Unknown	0.5	1.0	9.5	0.5	3.0	3.1	2.3	1.5	4.0	3.5
Chinese Individual	1.0	1.0	0.0	1.0	0.5	5.0	1.0	1.0	1.0	0.0
Chinese Academia	1.0	0.0	0.0	1.5	7.0	1.2	1.0	4.0	1.5	6.0
Chinese Company	1.5	5.8	3.5	3.0	3.5	4.8	5.8	4.5	2.5	4.5

10.1.2 Patent Applications in the EU Jurisdictions



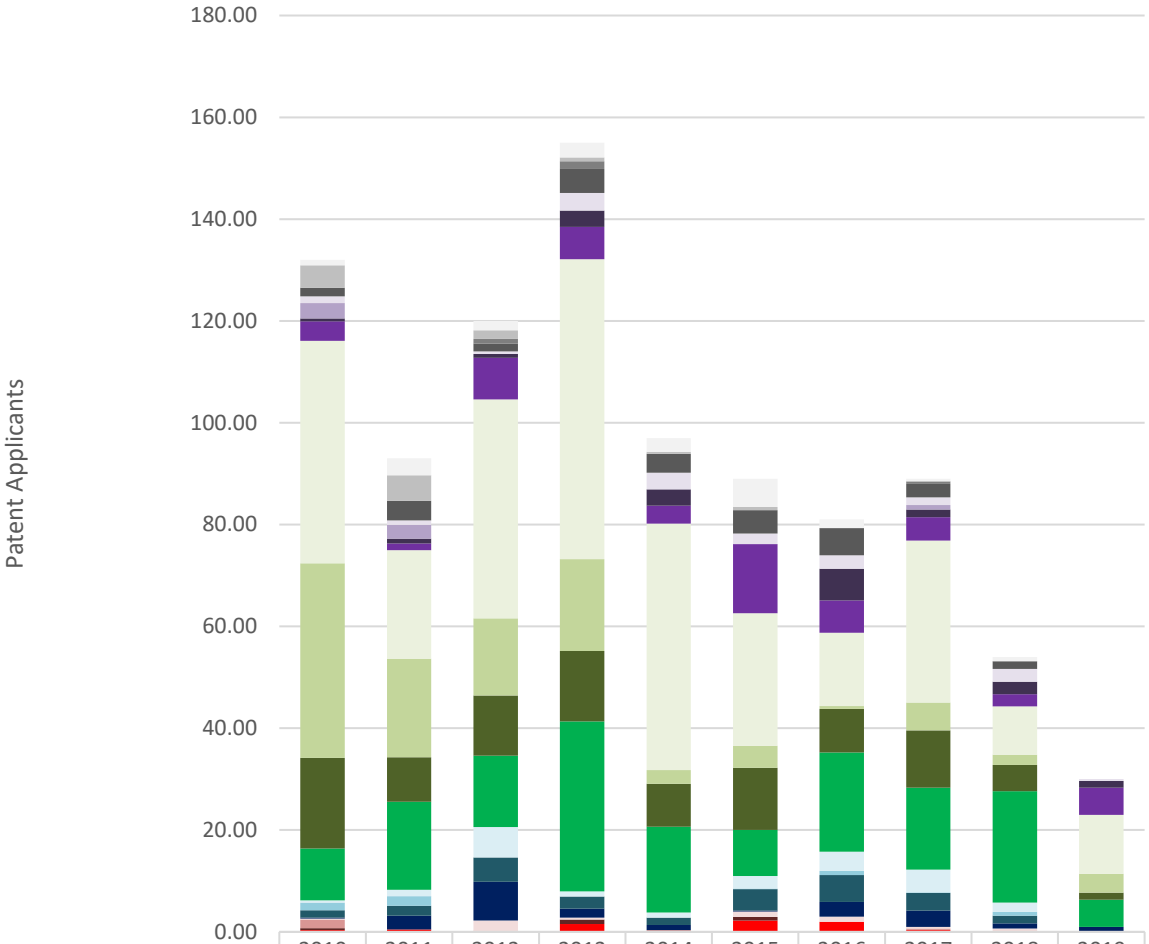
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.3	3.0	7.6	4.2	5.6	5.4	3.7	2.6	1.4	0.0
Unknown Individual	1.0	0.0	0.8	0.7	1.2	1.4	0.0	0.9	1.3	0.0
Unknown Academia	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Company	5.4	2.7	2.3	2.7	1.9	3.1	0.8	1.3	1.3	1.0
Rest of World Unknown	0.2	0.8	0.5	4.1	1.8	1.5	2.7	0.5	0.5	0.0
Rest of World Individual	0.9	2.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Rest of World Academia	1.0	1.3	0.0	1.9	0.8	0.0	1.5	0.5	4.5	0.0
Rest of World Company	0.9	1.1	3.3	2.2	2.1	8.5	1.5	1.6	1.3	1.5
American Unknown	19.5	22.7	15.7	29.4	19.8	13.2	17.2	23.3	9.8	1.5
American Individual	2.7	4.4	3.6	3.1	1.3	1.0	0.6	1.0	3.7	0.0
American Academia	12.0	4.0	1.1	1.3	1.6	1.7	4.2	3.8	1.4	1.0
American Company	6.9	5.4	2.5	7.7	2.1	3.2	11.1	3.3	8.9	1.0
EU-27 Unknown	1.3	5.7	13.4	5.6	5.7	4.8	3.3	4.6	2.8	0.5
EU-27 Individual	4.3	5.7	0.0	0.0	0.0	0.1	0.8	0.1	0.8	0.0
EU-27 Academia	3.2	3.8	8.4	3.9	1.3	3.5	2.3	4.9	4.3	1.0
EU-27 Company	2.5	5.2	2.8	4.3	4.9	1.7	4.4	1.7	2.3	1.5
Chinese Unknown	0.2	0.0	1.0	0.4	0.0	0.6	1.0	0.3	0.0	0.0
Chinese Individual	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Chinese Academia	0.3	0.0	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.0
Chinese Company	0.3	0.3	0.0	1.3	0.0	1.9	2.0	0.3	0.0	0.0

10.1.3 Patent Applications in the Danish Jurisdiction



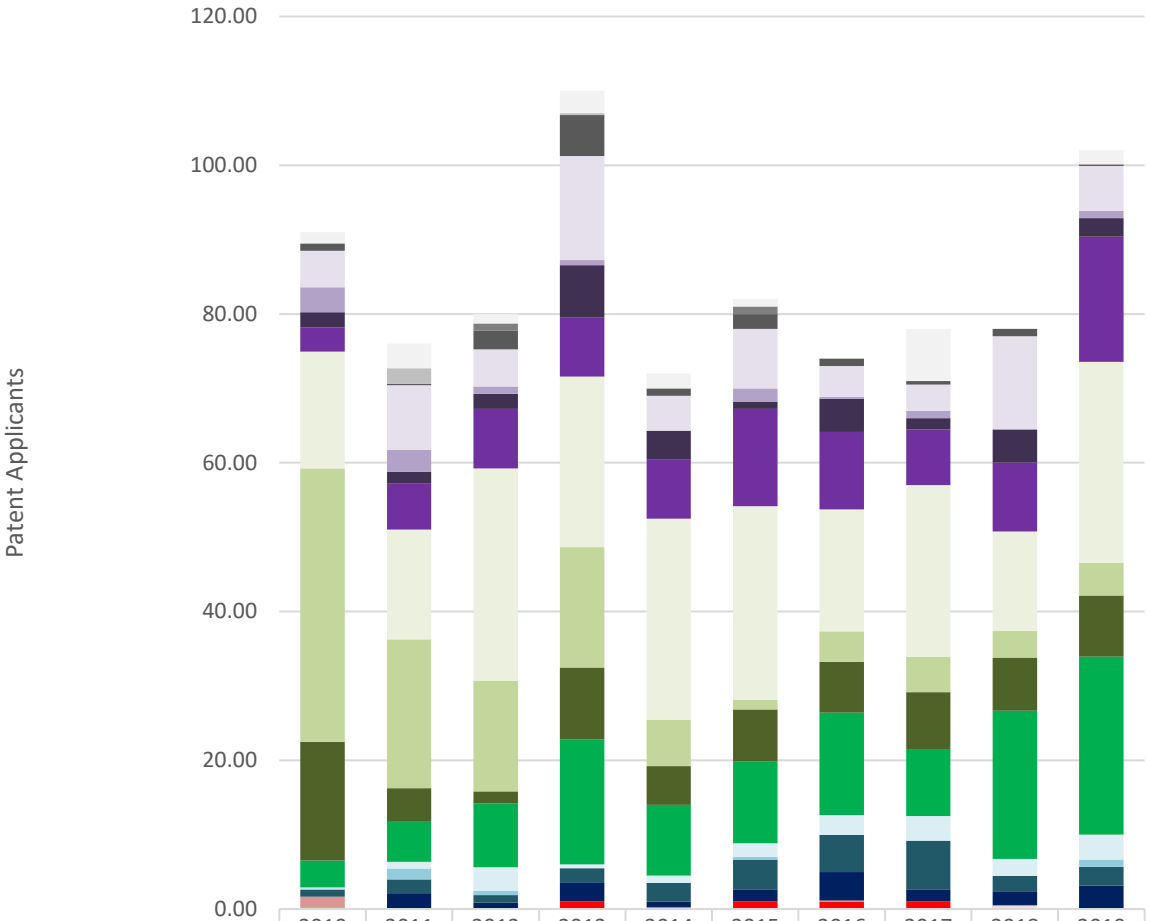
	2010	2011	2012	2013	2014	2015	2016
Unknown Unknown	0.9	0.3	0.8	0.9	1.4	0.8	0.0
Unknown Individual	1.0	0.0	0.3	0.0	0.4	0.0	0.0
Unknown Academia	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Unknown Company	0.1	0.6	0.3	0.0	0.2	1.5	0.0
Rest of World Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of World Individual	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of World Academia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of World Company	0.0	0.0	0.0	0.0	0.1	0.7	0.0
American Unknown	1.3	4.3	0.0	1.7	0.0	0.0	0.5
American Individual	0.0	0.0	0.0	0.0	0.0	0.0	0.0
American Academia	0.5	0.5	0.0	0.0	0.0	0.0	0.0
American Company	0.3	0.2	0.0	0.3	0.0	0.0	0.5
EU-27 Unknown	0.0	0.6	4.6	1.0	0.0	0.9	0.0
EU-27 Individual	0.0	2.7	0.0	0.0	0.0	0.0	0.0
EU-27 Academia	0.0	0.1	1.6	0.1	1.0	1.0	0.0
EU-27 Company	0.0	0.7	0.4	0.0	0.0	0.1	0.0
Chinese Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Individual	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Academia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Company	0.0	0.0	0.0	0.0	0.0	0.0	0.0

10.1.4 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.07	3.29	1.83	2.86	2.74	5.53	1.67	0.50	0.83	0.00
Unknown Individual	4.42	5.03	1.67	0.80	0.38	0.60	0.00	0.00	0.00	0.00
Unknown Academia	0.00	0.00	1.00	1.50	0.00	0.00	0.00	0.50	0.00	0.00
Unknown Company	1.70	3.88	1.50	4.70	3.68	4.60	5.33	2.67	1.50	0.00
Rest of World Unknown	1.28	0.83	0.50	3.47	3.25	2.08	2.67	1.50	2.50	0.33
Rest of World Individual	3.02	2.72	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
Rest of World Academia	0.58	0.94	0.75	3.20	3.25	0.00	6.25	1.50	2.50	1.33
Rest of World Company	3.87	1.33	8.17	6.33	3.50	13.58	6.33	4.63	2.39	5.33
American Unknown	43.67	21.32	42.98	58.92	48.44	26.02	14.37	31.78	9.50	11.60
American Individual	38.23	19.37	15.15	18.05	2.67	4.33	0.60	5.50	2.00	3.67
American Academia	17.83	8.70	11.83	13.83	8.40	12.25	8.53	11.25	5.17	1.40
American Company	10.15	17.28	14.04	33.37	16.85	9.00	19.50	16.07	21.87	5.33
EU-27 Unknown	0.42	1.31	5.96	1.00	1.00	2.49	3.80	4.50	1.79	0.00
EU-27 Individual	1.53	1.86	0.00	0.00	0.00	0.11	0.80	0.14	0.75	0.00
EU-27 Academia	1.42	1.93	4.75	2.39	1.50	4.24	5.25	3.43	1.54	0.00
EU-27 Company	0.25	2.70	7.63	1.75	1.00	0.16	2.90	3.18	1.00	1.00
Chinese Unknown	0.18	0.00	2.00	0.40	0.00	1.05	1.00	0.33	0.67	0.00
Chinese Individual	1.70	0.00	0.25	0.00	0.33	0.00	0.00	0.33	0.00	0.00
Chinese Academia	0.35	0.00	0.00	0.92	0.00	0.68	0.00	0.00	0.00	0.00
Chinese Company	0.35	0.50	0.00	1.52	0.00	2.26	2.00	0.33	0.00	0.00

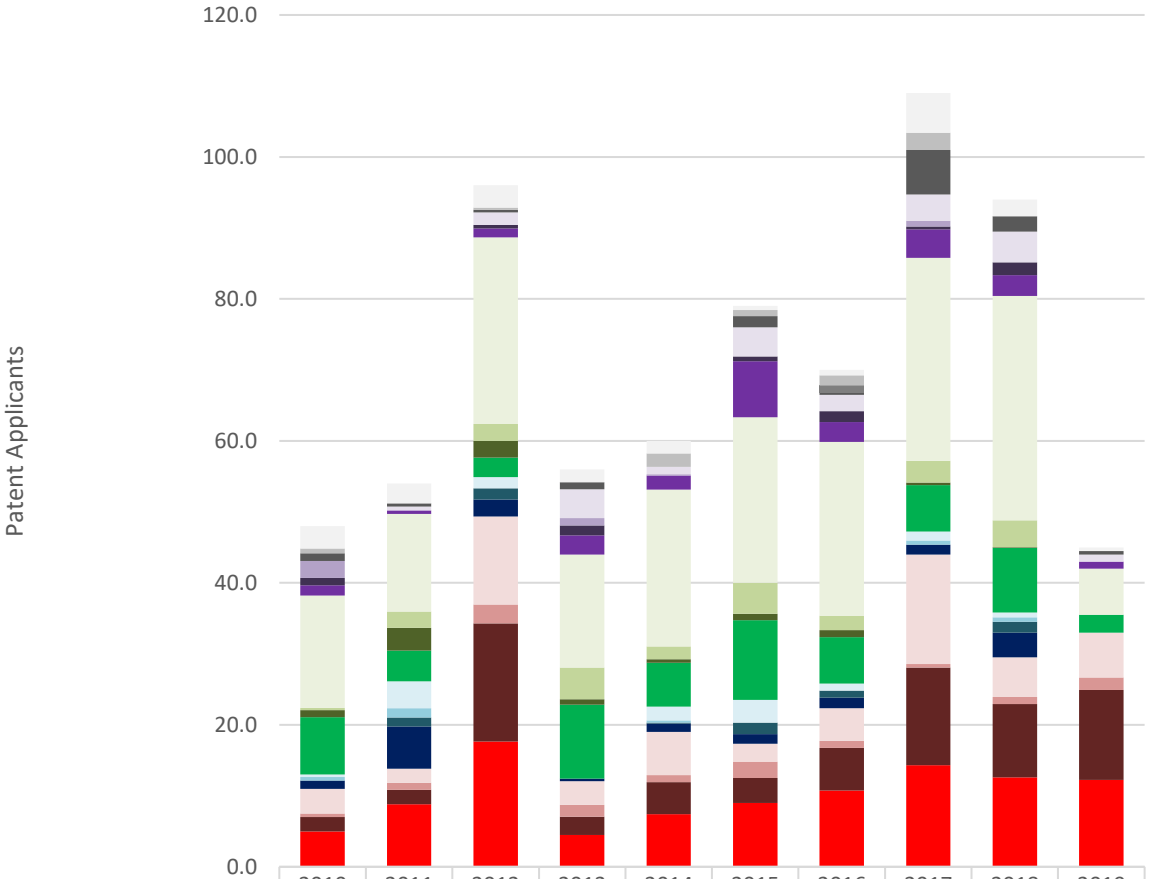
10.1.5 Patent Applications in the Rest of the World



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.50	3.28	1.25	3.00	2.00	1.00	0.00	7.00	0.00	1.90
Unknown Individual	0.00	2.11	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Academia	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Unknown Company	1.00	0.20	2.50	5.50	1.00	2.00	1.00	0.50	1.00	0.20
Rest of World Unknown	4.89	8.67	5.00	14.00	4.67	8.00	4.13	3.50	12.50	6.00
Rest of World Individual	3.35	2.93	1.00	0.67	0.00	1.75	0.25	1.00	0.00	1.00
Rest of World Academia	2.09	1.57	2.00	7.08	3.83	1.00	4.50	1.50	4.50	2.50
Rest of World Company	3.20	6.25	8.00	7.92	8.00	13.08	10.38	7.50	9.25	16.83
American Unknown	15.71	14.76	28.54	22.93	27.05	26.03	16.42	23.12	13.39	27.02
American Individual	36.75	20.00	14.88	16.20	6.22	1.30	4.08	4.73	3.55	4.40
American Academia	15.98	4.50	1.64	9.67	5.23	7.00	6.83	7.75	7.17	8.20
American Company	3.64	5.38	8.58	16.79	9.50	11.00	13.80	8.90	19.89	23.95
EU-27 Unknown	0.10	0.90	3.14	0.50	1.00	1.83	2.67	3.32	2.29	3.33
EU-27 Individual	0.20	1.47	0.57	0.00	0.00	0.33	0.00	0.00	0.00	1.00
EU-27 Academia	0.92	1.84	1.00	2.00	2.50	4.00	5.00	6.54	2.07	2.50
EU-27 Company	0.00	2.14	0.89	2.50	0.75	1.67	3.83	1.64	1.89	3.17
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
Chinese Individual	1.52	0.00	0.00	0.00	0.25	0.00	0.13	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.14	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00

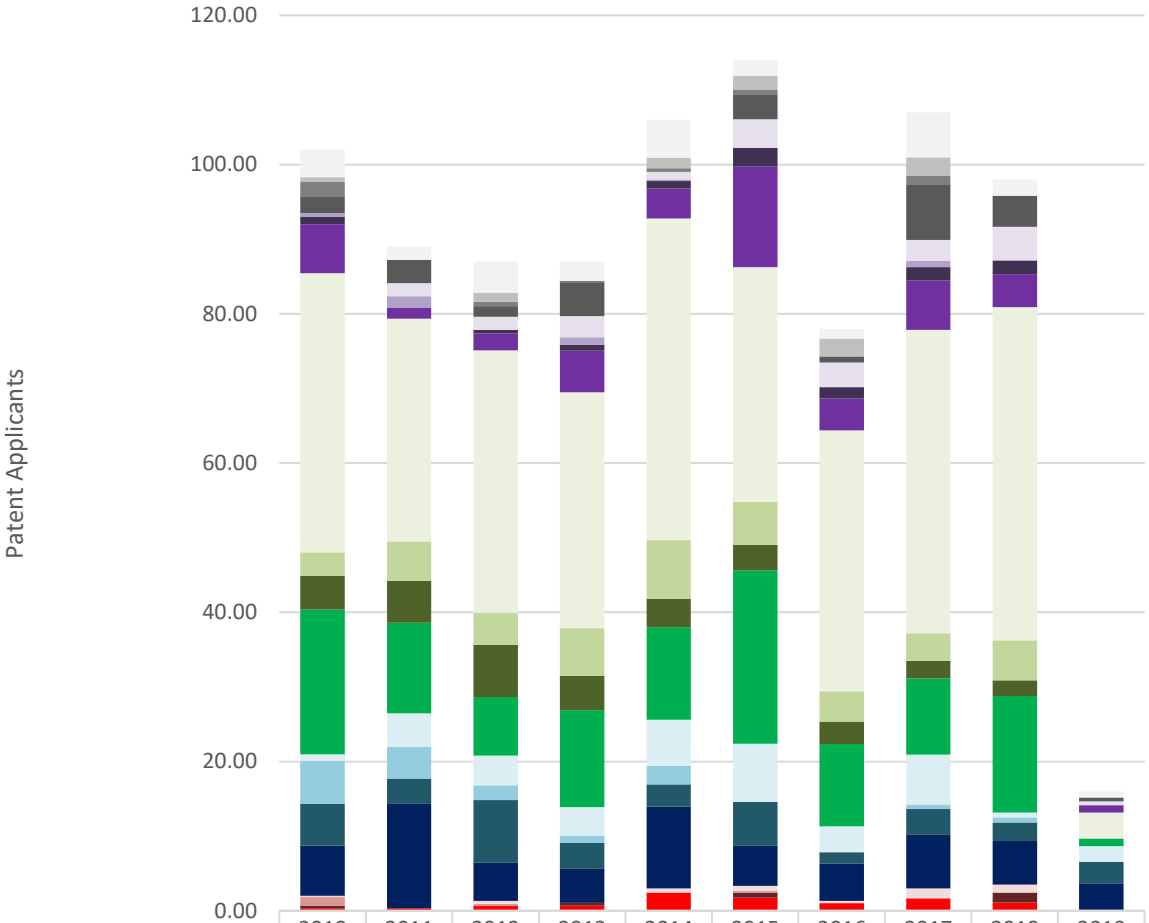
10.2 GENOME STUDY FOR CANCER

10.2.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



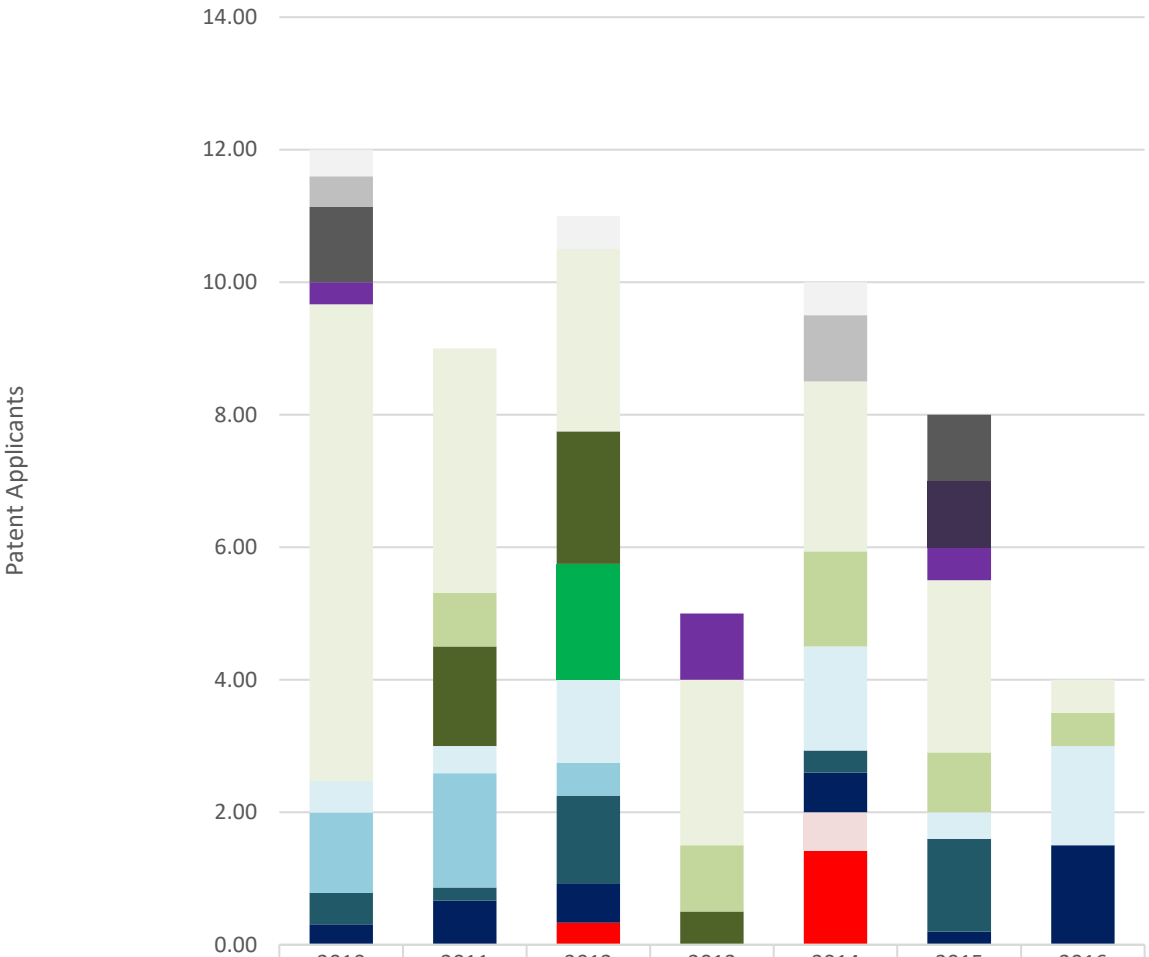
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	3.2	2.8	3.1	1.8	1.8	0.6	0.8	5.6	2.3	0.5
Unknown Individual	0.7	0.0	0.3	0.0	1.9	0.8	1.4	2.4	0.0	0.0
Unknown Academia	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Unknown Company	1.1	0.5	0.4	1.0	0.0	1.6	0.3	6.3	2.2	0.5
Rest of World Unknown	0.0	0.5	1.8	4.1	1.0	4.1	2.3	3.7	4.3	1.0
Rest of World Individual	2.4	0.0	0.0	1.0	0.2	0.0	0.0	0.8	0.0	0.0
Rest of World Academia	1.0	0.0	0.5	1.4	0.0	0.7	1.5	0.4	1.8	0.0
Rest of World Company	1.4	0.5	1.3	2.7	2.0	7.9	2.8	4.0	2.9	1.0
American Unknown	15.8	13.8	26.3	15.9	22.1	23.3	24.5	28.6	31.6	6.5
American Individual	0.3	2.3	2.4	4.5	1.8	4.3	2.0	3.1	3.8	0.0
American Academia	1.0	3.2	2.3	0.7	0.5	0.9	1.0	0.4	0.1	0.0
American Company	8.1	4.3	2.8	10.5	6.2	11.2	6.5	6.5	9.1	2.5
EU-27 Unknown	0.3	3.8	1.6	0.0	2.0	3.2	1.0	1.3	0.7	0.0
EU-27 Individual	0.5	1.3	0.0	0.0	0.3	0.0	0.0	0.6	0.7	0.0
EU-27 Academia	0.0	1.2	1.6	0.0	0.1	1.6	1.0	0.0	1.5	0.0
EU-27 Company	1.2	6.0	2.4	0.3	1.2	1.4	1.5	1.4	3.5	0.0
Chinese Unknown	3.5	2.0	12.4	3.3	6.1	2.5	4.6	15.4	5.6	6.3
Chinese Individual	0.5	1.0	2.6	1.7	1.0	2.3	1.0	0.5	1.0	1.8
Chinese Academia	2.0	2.0	16.7	2.6	4.5	3.5	6.0	13.8	10.3	12.7
Chinese Company	5.0	8.8	17.6	4.5	7.4	9.0	10.8	14.3	12.6	12.3

10.2.2 Patent Applications in the EU Jurisdictions



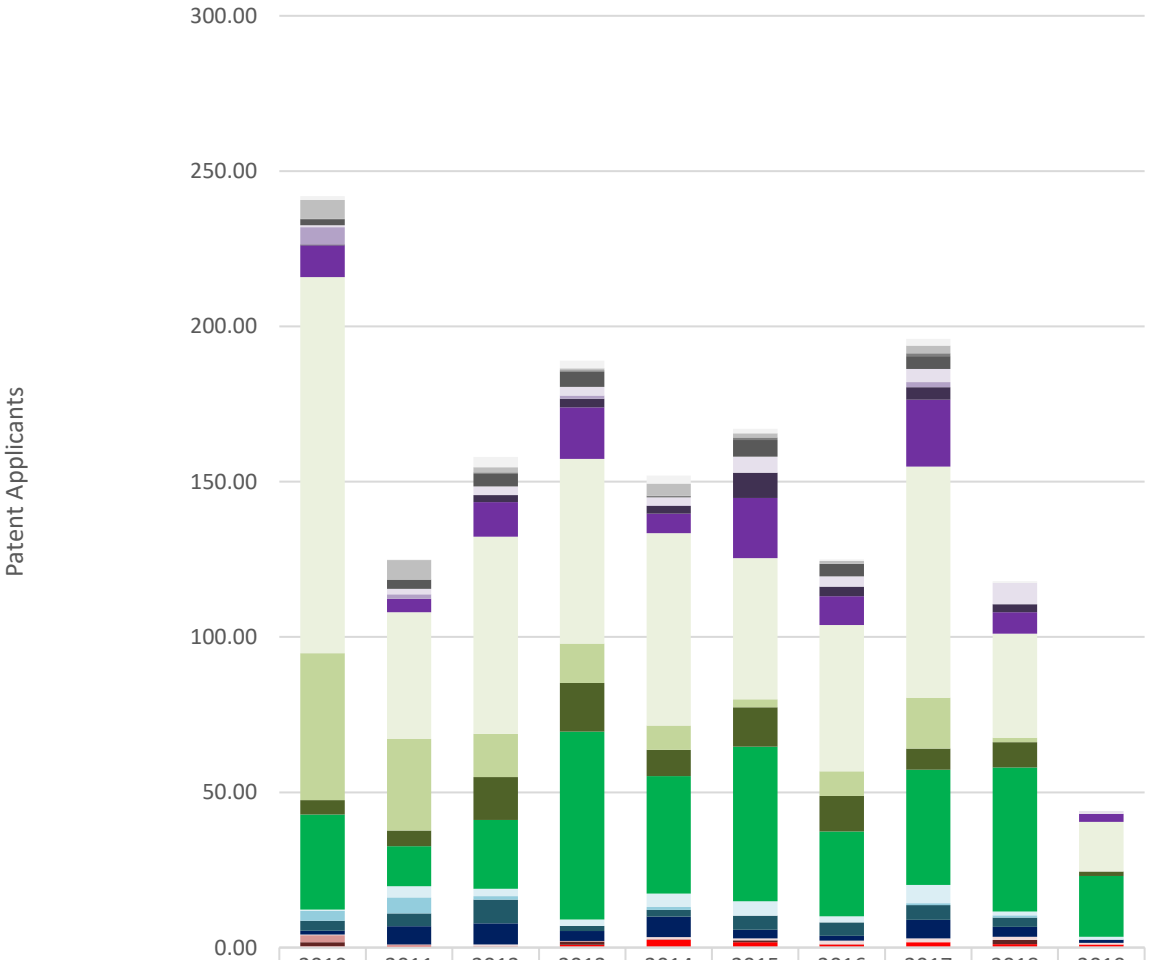
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	3.67	1.75	4.15	2.57	5.05	2.07	1.29	6.02	2.17	0.83
Unknown Individual	0.67	0.00	1.21	0.00	1.42	1.83	2.43	2.43	0.00	0.00
Unknown Academia	2.00	0.00	0.61	0.20	0.43	0.64	0.00	1.17	0.00	0.00
Unknown Company	2.13	3.14	1.41	4.53	0.10	3.37	0.79	7.46	4.17	0.50
Rest of World Unknown	0.00	1.75	1.75	2.85	1.00	3.83	3.33	2.82	4.50	0.50
Rest of World Individual	0.50	1.50	0.00	1.00	0.20	0.00	0.00	0.83	0.00	0.00
Rest of World Academia	1.00	0.00	0.50	0.79	1.00	2.50	1.50	1.81	1.83	0.00
Rest of World Company	6.58	1.50	2.25	5.57	4.00	13.48	4.29	6.60	4.42	1.00
American Unknown	37.39	29.87	35.21	31.63	43.11	31.50	34.93	40.68	44.69	3.50
American Individual	3.21	5.25	4.26	6.40	7.86	5.76	4.11	3.67	5.35	0.00
American Academia	4.50	5.62	7.00	4.58	3.81	3.38	3.00	2.38	2.11	0.00
American Company	19.39	12.14	7.87	12.98	12.42	23.24	11.00	10.22	15.60	1.00
EU-27 Unknown	0.90	4.52	3.97	3.83	6.19	7.83	3.50	6.70	0.67	2.10
EU-27 Individual	5.73	4.25	2.00	1.00	2.47	0.00	0.00	0.57	0.67	0.00
EU-27 Academia	5.57	3.38	8.40	3.47	2.97	5.86	1.50	3.42	2.50	2.87
EU-27 Company	6.76	14.00	5.08	4.53	10.97	5.37	5.00	7.23	5.83	3.70
Chinese Unknown	0.18	0.00	0.40	0.00	0.58	0.63	0.33	1.33	1.07	0.00
Chinese Individual	1.12	0.00	0.30	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Chinese Academia	0.35	0.00	0.00	0.41	0.00	0.63	0.00	0.00	1.33	0.00
Chinese Company	0.35	0.33	0.63	0.67	2.42	1.75	1.00	1.67	1.10	0.00

10.2.3 Patent Applicantions in the Danish Jurisdiction



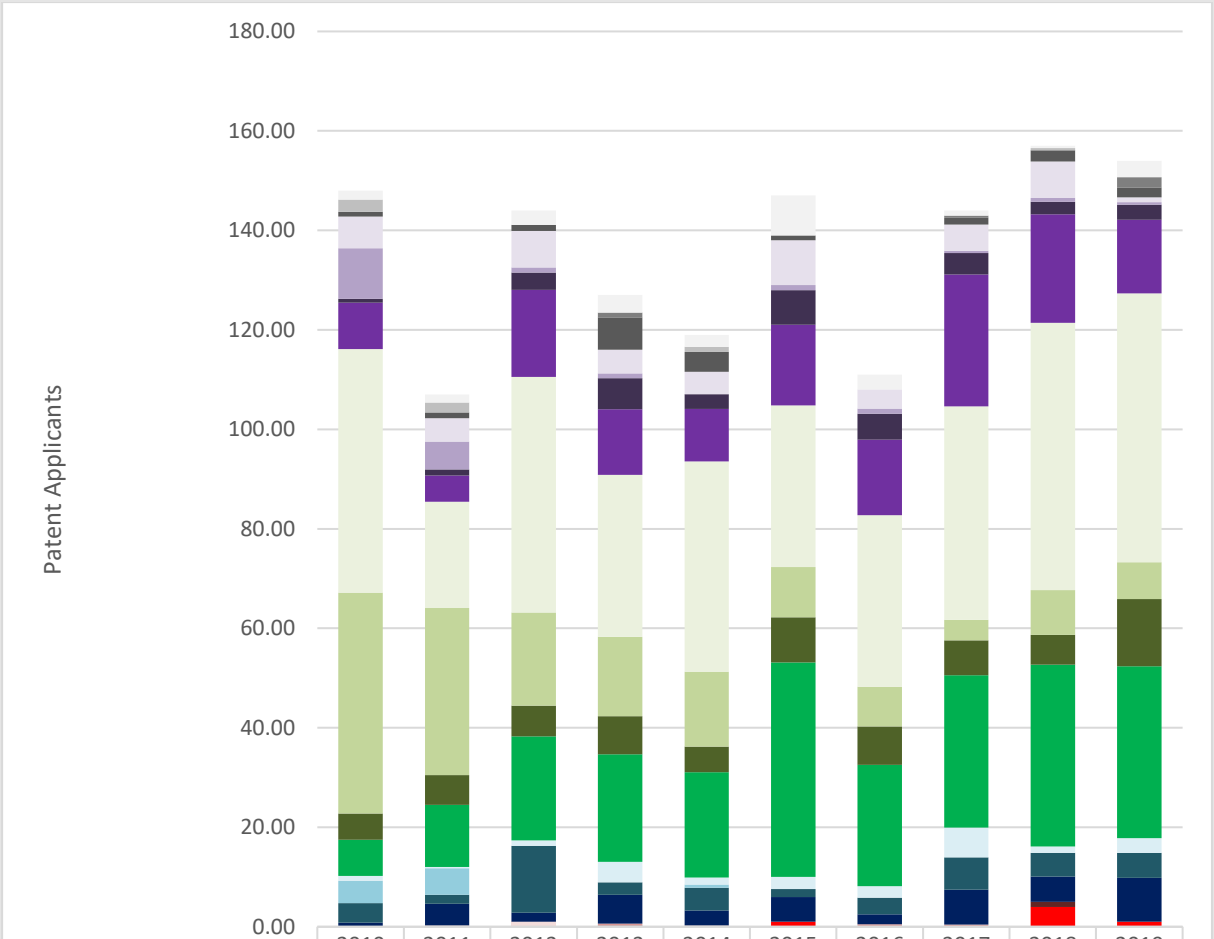
	2010	2011	2012	2013	2014	2015	2016
Unknown Unknown	0.40	0.00	0.50	0.00	0.50	0.00	0.00
Unknown Individual	0.47	0.00	0.00	0.00	1.00	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	1.13	0.00	0.00	0.00	0.00	1.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Rest of World Company	0.33	0.00	0.00	1.00	0.00	0.50	0.00
American Unknown	7.19	3.69	2.75	2.50	2.56	2.60	0.50
American Individual	0.00	0.81	0.00	1.00	1.44	0.90	0.50
American Academia	0.00	1.50	2.00	0.50	0.00	0.00	0.00
American Company	0.00	0.00	1.75	0.00	0.00	0.00	0.00
EU-27 Unknown	0.48	0.41	1.25	0.00	1.57	0.40	1.50
EU-27 Individual	1.21	1.72	0.50	0.00	0.00	0.00	0.00
EU-27 Academia	0.47	0.20	1.33	0.00	0.33	1.40	0.00
EU-27 Company	0.31	0.67	0.58	0.00	0.60	0.20	1.50
Chinese Unknown	0.00	0.00	0.00	0.00	0.58	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.33	0.00	1.42	0.00	0.00

10.2.4 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.33	0.27	3.38	2.50	2.62	1.40	0.50	2.20	0.50	0.00
Unknown Individual	5.98	6.23	1.63	0.60	3.92	1.40	1.00	2.43	0.00	0.00
Unknown Academia	0.20	0.00	0.48	0.50	0.43	0.83	0.00	1.00	0.00	0.00
Unknown Company	1.90	2.96	4.03	4.83	0.10	5.33	4.00	4.11	0.00	0.00
Rest of World Unknown	0.67	1.75	2.75	2.85	2.50	5.10	3.33	4.19	7.00	1.00
Rest of World Individual	5.56	1.50	0.00	1.00	0.20	0.00	0.00	1.64	0.00	0.00
Rest of World Academia	0.25	0.00	2.33	2.79	2.50	8.20	3.00	4.06	2.50	0.00
Rest of World Company	10.19	4.33	11.08	16.57	6.30	19.37	9.33	21.50	6.89	2.50
American Unknown	121.14	40.79	63.54	59.52	61.89	45.44	47.07	74.48	33.50	16.00
American Individual	47.25	29.48	13.88	12.63	7.83	2.62	7.93	16.30	1.50	0.00
American Academia	4.70	5.08	13.83	15.73	8.47	12.60	11.50	6.81	8.17	1.50
American Company	30.55	12.83	22.17	60.50	37.89	49.83	27.25	37.18	46.37	19.50
EU-27 Unknown	0.48	3.63	2.35	2.00	4.28	4.58	2.00	5.84	1.20	1.00
EU-27 Individual	3.21	5.18	1.17	0.00	0.97	0.00	0.00	0.57	0.67	0.00
EU-27 Academia	3.11	4.08	7.54	1.67	2.13	4.61	4.33	4.73	3.04	0.00
EU-27 Company	1.31	5.89	6.83	3.20	6.63	2.69	1.50	5.98	3.17	1.00
Chinese Unknown	0.18	0.00	0.40	0.00	0.58	0.63	1.00	1.33	1.07	0.50
Chinese Individual	2.29	0.50	0.30	0.20	0.33	0.00	0.25	0.00	0.00	0.00
Chinese Academia	1.35	0.00	0.00	1.00	0.00	0.63	0.00	0.00	1.33	0.00
Chinese Company	0.35	0.50	0.30	0.92	2.42	1.75	1.00	1.67	1.10	1.00

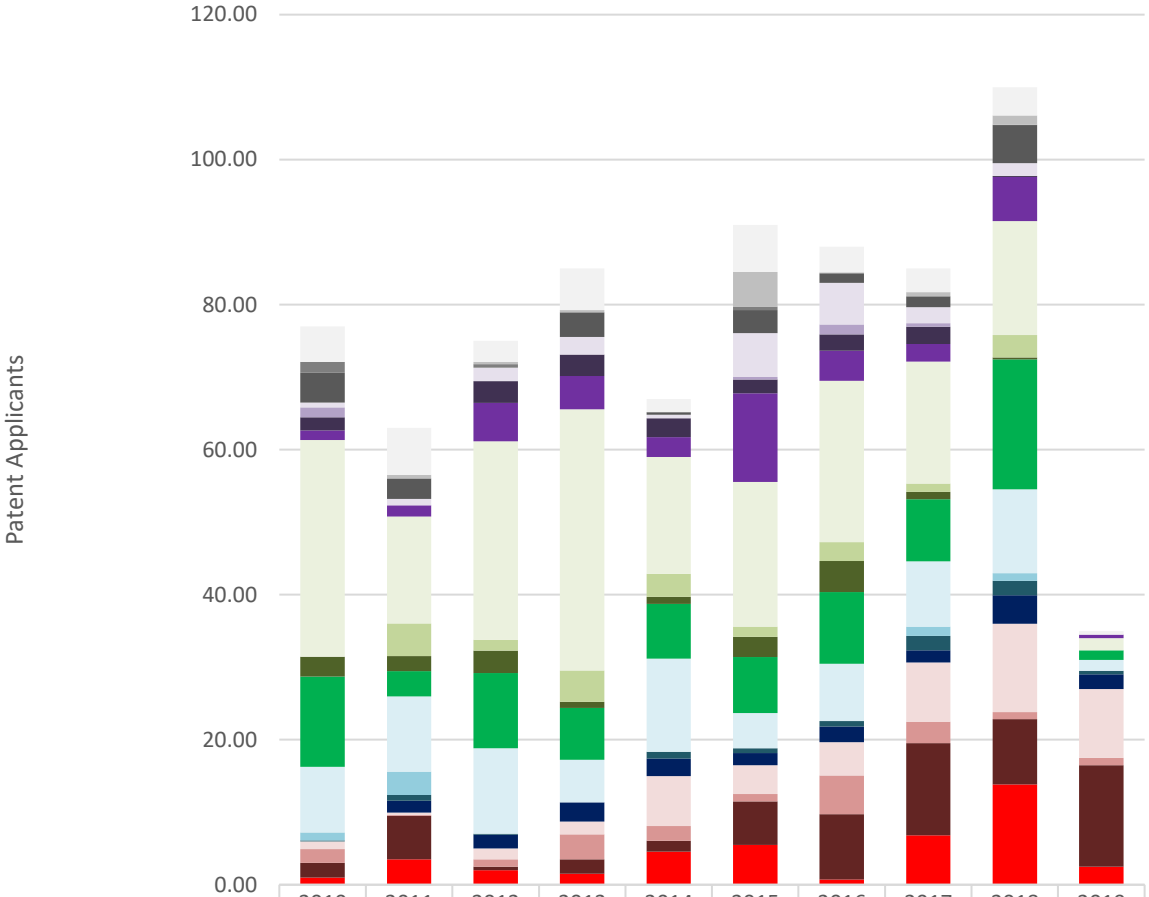
10.2.5 Patent Applications in the Rest of the World



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.81	1.62	2.88	3.50	2.42	8.00	3.00	1.00	0.44	3.33
Unknown Individual	2.42	1.97	0.00	0.00	1.00	0.00	0.00	0.00	0.44	0.00
Unknown Academia	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50	0.00	2.00
Unknown Company	1.00	1.20	1.25	6.50	4.00	1.00	0.00	1.33	2.25	2.00
Rest of World Unknown	6.39	4.67	7.33	4.73	4.50	9.00	3.83	5.29	7.36	1.00
Rest of World Individual	10.14	5.61	1.00	1.00	0.00	1.00	1.00	0.43	0.75	0.50
Rest of World Academia	0.75	1.25	3.50	6.23	3.00	7.00	5.25	4.33	2.50	3.00
Rest of World Company	9.37	5.23	17.50	13.20	10.50	16.20	15.17	26.48	21.83	14.83
American Unknown	48.97	21.40	47.34	32.56	42.31	32.47	34.50	42.96	53.76	54.04
American Individual	44.36	33.57	18.75	15.96	15.05	10.11	7.98	4.08	8.98	7.39
American Academia	5.33	5.97	6.17	7.67	5.17	9.06	7.75	7.05	6.00	13.53
American Company	7.24	12.49	20.95	21.58	21.15	43.17	24.33	30.60	36.52	34.54
EU-27 Unknown	1.00	0.27	1.05	4.17	1.42	2.42	2.33	6.00	1.29	3.00
EU-27 Individual	4.47	5.37	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	3.94	1.77	13.49	2.50	4.58	1.58	3.33	6.50	4.82	5.00
EU-27 Company	0.67	4.38	1.80	5.78	3.00	5.00	2.00	7.00	5.06	8.83
Chinese Unknown	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Individual	0.14	0.25	0.00	0.37	0.25	0.00	0.52	0.45	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	1.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.00	1.00

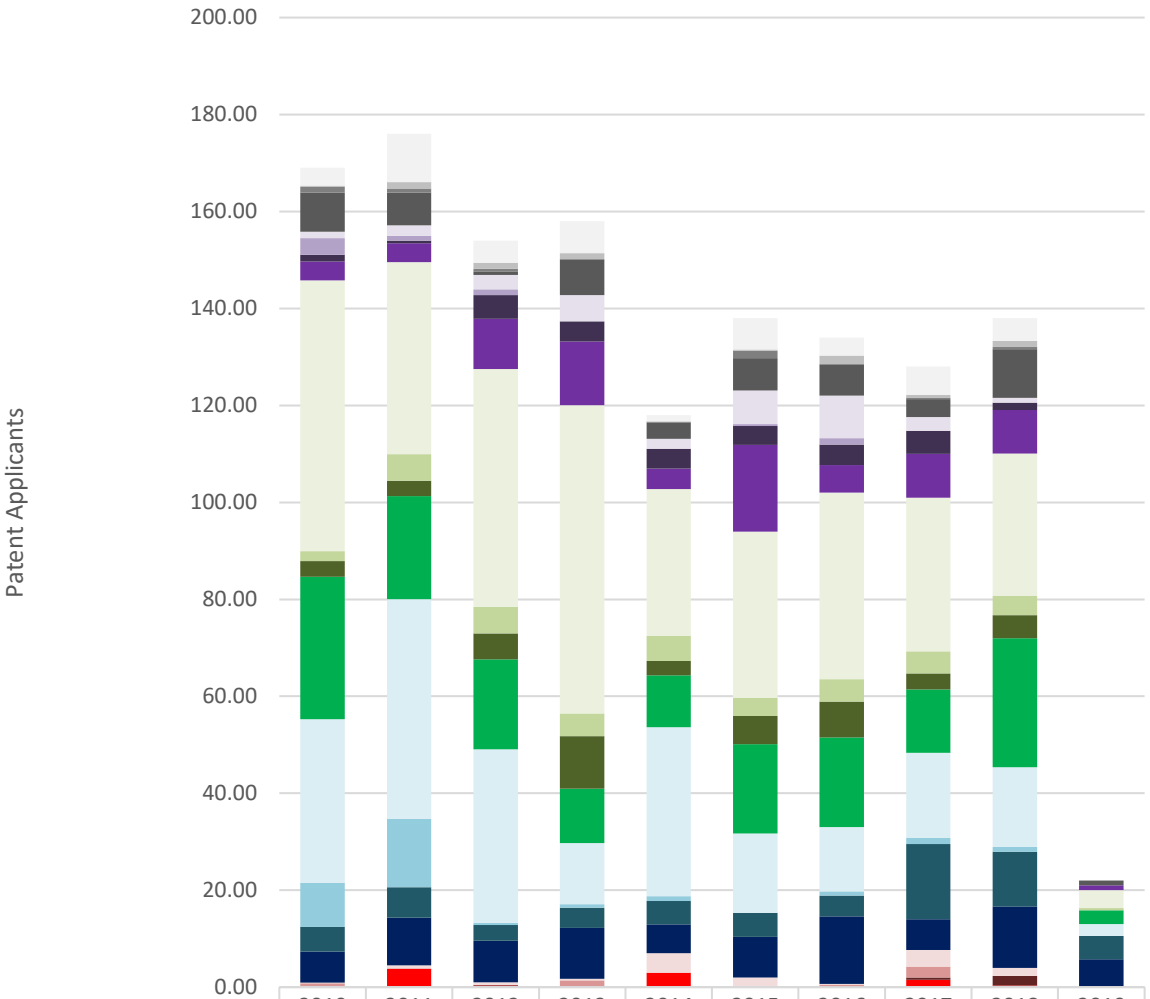
10.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE

10.3.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



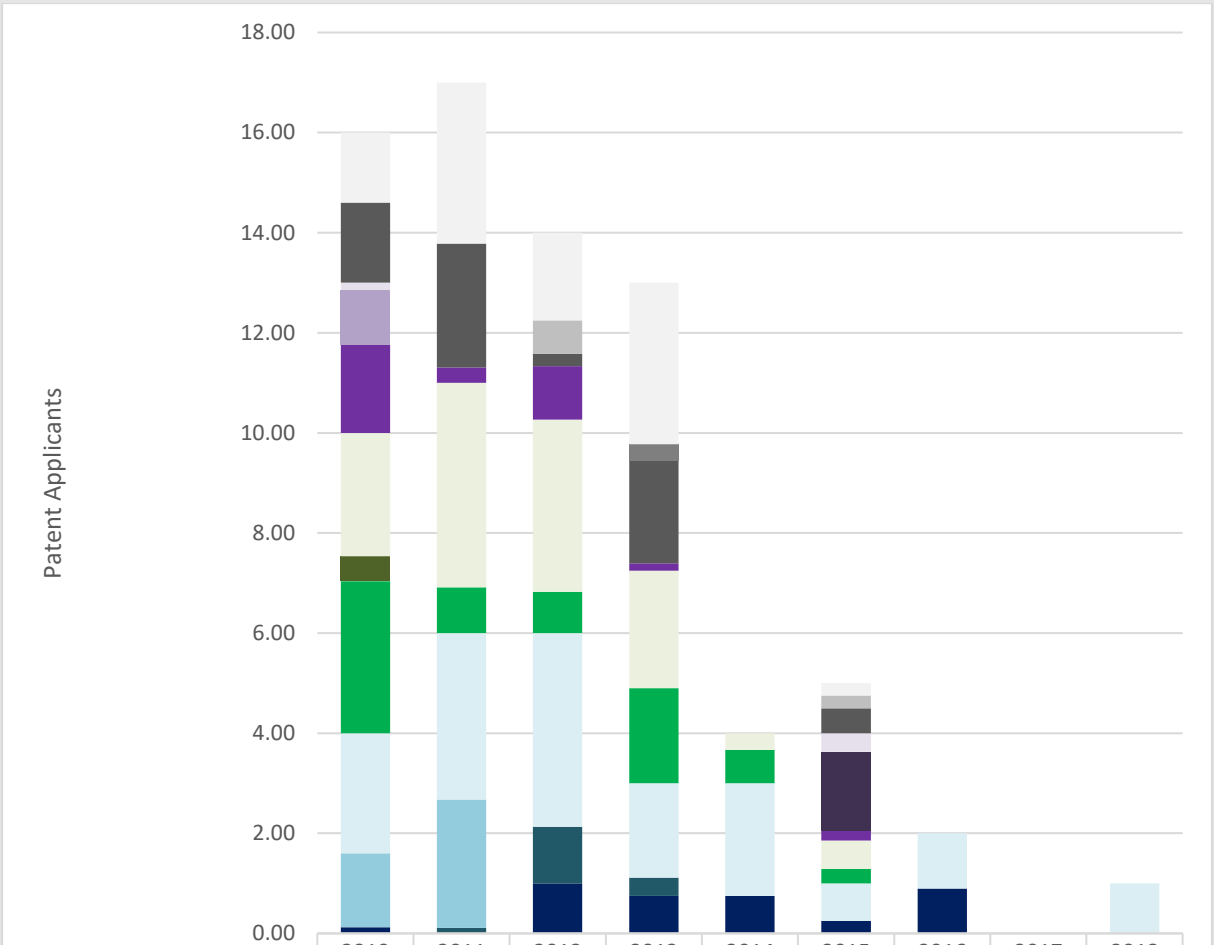
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	4.90	6.46	2.90	5.76	1.83	6.50	3.56	3.29	3.92	0.50
Unknown Individual	0.00	0.50	0.31	0.29	0.00	4.75	0.11	0.57	1.25	0.00
Unknown Academia	1.50	0.00	0.50	0.00	0.00	0.50	0.00	0.00	0.07	0.00
Unknown Company	4.10	2.85	0.00	3.42	0.33	3.17	1.33	1.48	5.25	0.00
Rest of World Unknown	0.66	0.85	1.83	2.42	0.50	6.04	5.75	2.20	1.75	0.00
Rest of World Individual	1.38	0.00	0.00	0.00	0.00	0.36	1.33	0.50	0.00	0.00
Rest of World Academia	1.82	0.00	3.00	2.95	2.58	1.90	2.25	2.40	0.13	0.00
Rest of World Company	1.31	1.54	5.30	4.62	2.75	12.25	4.17	2.40	6.13	0.50
American Unknown	29.88	14.75	27.38	35.98	16.12	19.96	22.24	16.83	15.70	1.67
American Individual	0.00	4.50	1.50	4.34	3.20	1.41	2.61	1.17	3.10	0.00
American Academia	2.72	2.08	3.06	0.84	0.95	2.78	4.28	1.00	0.25	0.00
American Company	12.48	3.50	10.38	7.18	7.53	7.73	9.86	8.58	17.91	1.33
EU-27 Unknown	9.03	10.38	11.79	5.85	12.87	4.83	7.93	9.00	11.58	1.50
EU-27 Individual	1.10	3.21	0.00	0.00	0.00	0.00	0.00	1.25	1.05	0.00
EU-27 Academia	0.13	0.80	0.13	0.00	0.92	0.67	0.75	2.00	2.00	0.50
EU-27 Company	0.00	1.63	1.91	2.65	2.42	1.67	2.15	1.67	3.92	2.00
Chinese Unknown	1.08	0.31	1.50	1.79	6.92	4.00	4.61	8.19	12.17	9.50
Chinese Individual	1.92	0.11	1.00	3.43	2.00	1.00	5.33	2.94	1.00	1.00
Chinese Academia	2.00	6.00	0.50	2.00	1.50	6.00	9.00	12.70	9.00	14.00
Chinese Company	1.00	3.53	2.00	1.50	4.58	5.50	0.72	6.83	13.83	2.50

10.3.2 Patent Applications in the EU Jurisdictions



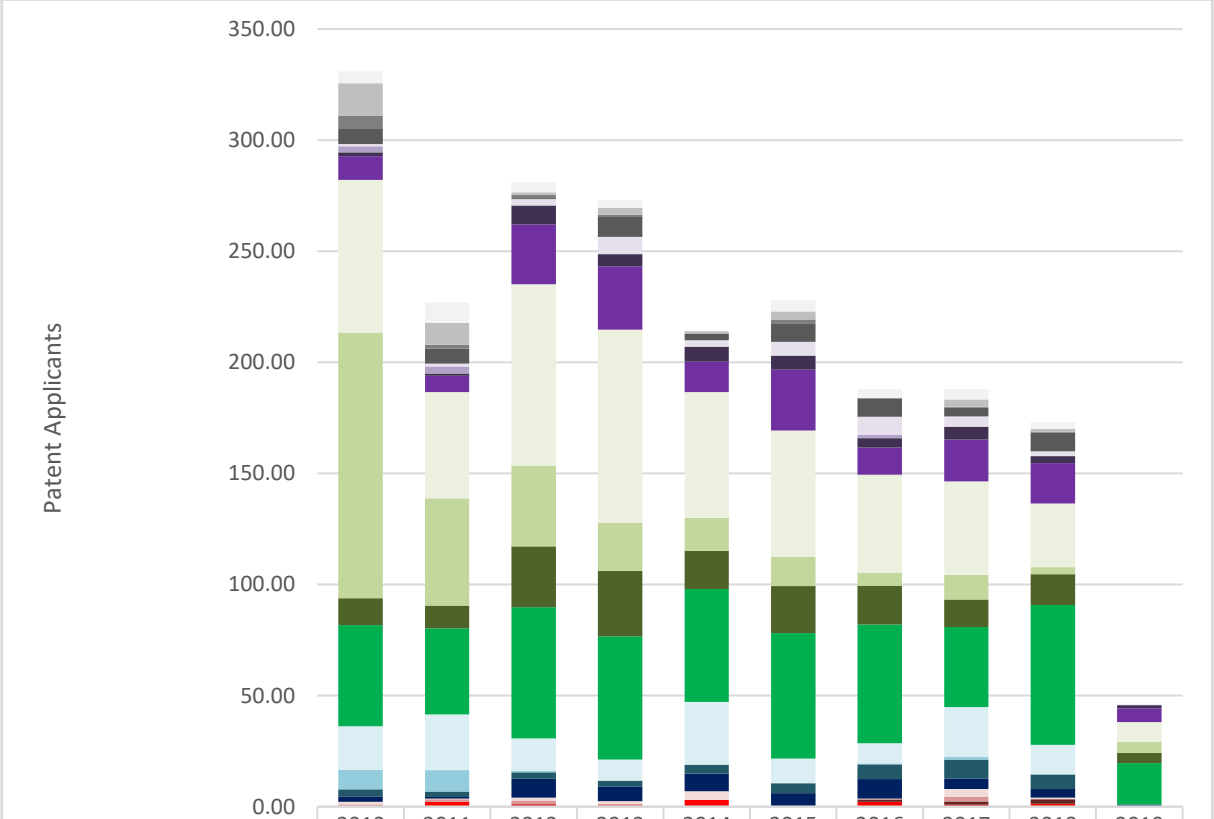
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	3.65	9.91	4.55	6.60	1.33	6.50	3.72	5.82	4.67	0.00
Unknown Individual	0.25	1.34	1.31	1.29	0.00	0.25	1.78	0.57	1.25	0.00
Unknown Academia	1.25	0.83	0.50	0.00	0.25	1.50	0.00	0.33	0.50	0.00
Unknown Company	8.02	6.77	0.70	7.33	3.33	6.67	6.50	3.64	10.00	1.00
Rest of World Unknown	1.33	2.18	3.00	5.42	2.00	6.96	8.75	2.90	1.00	0.00
Rest of World Individual	3.44	1.00	1.17	0.00	0.00	0.36	1.33	0.00	0.00	0.00
Rest of World Academia	1.41	0.50	4.92	4.20	4.08	3.90	4.25	4.73	1.50	0.00
Rest of World Company	3.86	3.91	10.38	13.12	4.25	17.91	5.67	9.07	9.00	1.00
American Unknown	55.85	39.63	49.00	63.61	30.21	34.24	38.49	31.65	29.35	3.67
American Individual	2.05	5.43	5.48	4.67	5.27	3.80	4.61	4.60	4.03	0.50
American Academia	3.22	3.23	5.36	10.79	2.95	5.81	7.37	3.25	4.75	0.00
American Company	29.43	21.23	18.58	11.26	10.70	18.40	18.53	13.08	26.55	2.83
EU-27 Unknown	33.72	45.29	35.75	12.60	34.83	16.40	13.25	17.60	16.44	2.42
EU-27 Individual	9.11	14.14	0.50	0.75	1.00	0.00	0.83	1.25	1.05	0.00
EU-27 Academia	5.08	6.26	3.22	4.14	4.80	4.95	4.30	15.50	11.24	4.83
EU-27 Company	6.41	9.87	8.59	10.51	5.98	8.37	13.95	6.33	12.67	5.75
Chinese Unknown	0.14	0.56	0.56	0.29	4.00	2.00	0.11	3.44	1.67	0.00
Chinese Individual	0.79	0.14	0.00	1.43	0.00	0.00	0.33	2.24	0.00	0.00
Chinese Academia	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.45	2.00	0.00
Chinese Company	0.00	3.78	0.33	0.00	3.00	0.00	0.22	1.53	0.33	0.00

10.3.3 Patent Applications in the Danish Jurisdiction



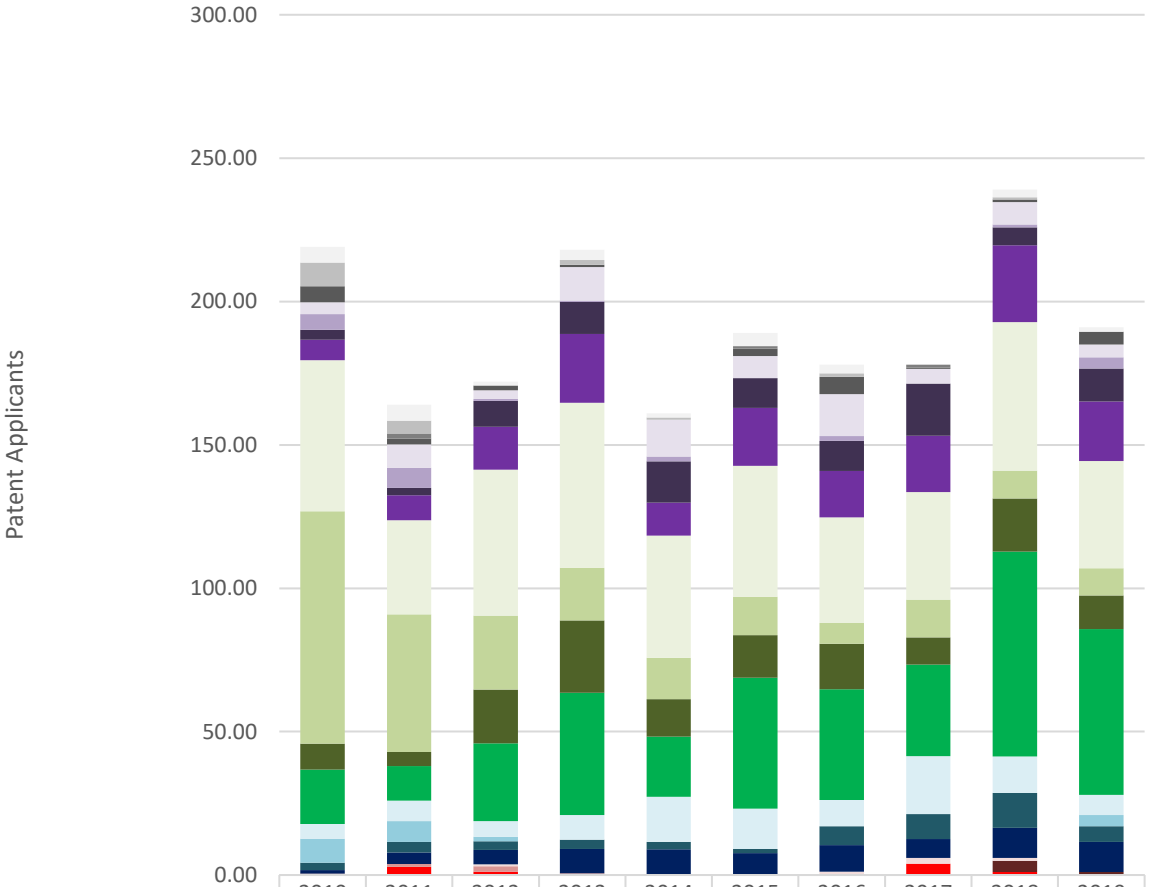
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Unknown Unknown	1.40	3.21	1.75	3.23	0.00	0.25	0.00	0.00	0.00
Unknown Individual	0.00	0.00	0.67	0.00	0.00	0.25	0.00	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00
Unknown Company	1.60	2.48	0.25	2.05	0.00	0.50	0.00	0.00	0.00
Rest of World Unknown	0.14	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00
Rest of World Individual	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	1.56	0.00	0.00	0.00
Rest of World Company	1.76	0.31	1.07	0.14	0.00	0.21	0.00	0.00	0.00
American Unknown	2.47	4.08	3.44	2.35	0.33	0.57	0.00	0.00	0.00
American Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Academia	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Company	3.03	0.92	0.82	1.90	0.67	0.29	0.00	0.00	0.00
EU-27 Unknown	2.40	3.32	3.87	1.88	2.25	0.75	1.10	0.00	1.00
EU-27 Individual	1.48	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	0.11	1.13	0.37	0.00	0.00	0.00	0.00	0.00
EU-27 Company	0.13	0.00	1.00	0.75	0.75	0.25	0.90	0.00	0.00
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

10.3.4 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	5.28	9.26	4.53	3.39	0.00	5.15	4.06	4.75	3.00	0.00
Unknown Individual	14.69	9.86	1.00	3.13	1.00	3.60	0.11	3.24	1.25	0.00
Unknown Academia	6.00	1.75	1.50	1.00	0.00	2.00	0.00	0.33	0.50	0.00
Unknown Company	6.75	6.67	0.53	8.91	3.00	8.08	8.33	3.98	8.25	0.00
Rest of World Unknown	0.99	1.35	2.83	7.92	3.00	6.13	8.25	4.70	2.25	0.33
Rest of World Individual	2.71	3.17	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.00
Rest of World Academia	1.85	1.00	8.50	5.45	6.75	6.40	4.25	5.73	3.17	1.33
Rest of World Company	10.57	7.32	26.95	28.53	13.58	27.40	12.17	18.88	18.08	6.33
American Unknown	68.77	47.83	81.72	86.96	56.67	56.75	44.17	42.00	28.67	8.67
American Individual	119.61	48.25	36.33	21.68	14.88	13.25	5.83	11.17	3.25	5.17
American Academia	12.05	10.33	27.25	29.41	17.12	21.12	17.50	12.33	13.83	4.58
American Company	45.46	38.72	59.18	55.43	50.83	56.50	53.50	36.10	62.87	18.58
EU-27 Unknown	19.58	25.10	14.56	9.53	28.26	11.07	9.05	22.37	13.08	0.00
EU-27 Individual	8.83	9.63	0.75	0.00	0.00	0.00	0.33	1.25	0.33	0.00
EU-27 Academia	3.16	2.37	2.80	2.62	3.99	4.45	6.70	8.50	6.55	1.00
EU-27 Company	2.44	0.72	8.58	6.52	7.92	5.78	8.75	4.67	3.92	0.00
Chinese Unknown	1.14	0.31	1.25	1.14	4.00	0.00	0.11	3.44	0.67	0.00
Chinese Individual	1.10	1.18	1.62	0.71	0.00	0.33	0.33	2.24	0.00	0.00
Chinese Academia	0.00	0.00	0.11	0.00	0.00	0.00	1.00	1.45	2.00	0.00
Chinese Company	0.00	2.19	1.02	0.67	3.00	0.00	2.22	0.87	1.33	0.00

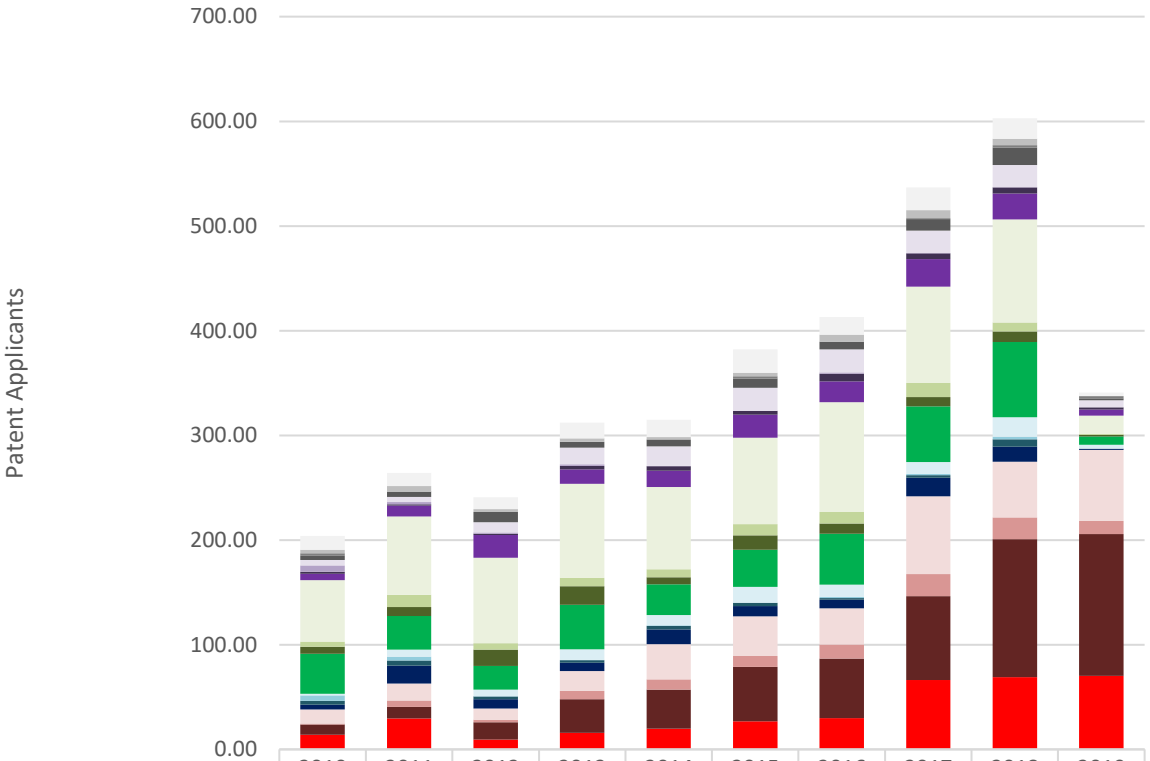
10.3.5 Patent Applications in the Rest of the World



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	5.41	5.53	1.25	3.50	1.50	4.50	3.00	0.00	2.63	1.50
Unknown Individual	8.31	4.50	0.00	1.75	0.75	0.00	1.25	0.00	0.75	0.00
Unknown Academia	0.00	1.78	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00
Unknown Company	5.50	2.00	1.75	0.70	0.00	2.50	6.00	0.50	1.00	4.50
Rest of World Unknown	4.16	8.17	3.00	11.75	12.83	7.70	14.63	5.10	7.77	4.50
Rest of World Individual	5.48	7.08	0.67	0.50	1.67	0.00	1.75	0.00	1.00	3.88
Rest of World Academia	3.42	2.50	9.00	11.08	14.33	10.42	10.50	18.20	6.20	11.50
Rest of World Company	7.13	8.68	14.98	24.00	11.58	20.13	16.13	19.70	26.87	20.74
American Unknown	52.76	32.85	50.91	57.62	42.63	45.76	36.88	37.44	51.78	37.40
American Individual	80.99	47.98	25.75	18.35	14.42	13.38	7.29	13.15	9.68	9.54
American Academia	9.10	4.95	18.74	25.20	13.08	14.83	15.79	9.53	18.50	11.70
American Company	18.90	12.09	27.17	42.67	20.96	45.67	38.67	31.88	71.49	57.75
EU-27 Unknown	5.16	7.15	5.44	8.60	15.75	14.00	9.08	20.25	12.73	7.13
EU-27 Individual	8.35	7.18	1.62	0.00	0.00	0.00	0.00	0.00	0.00	3.88
EU-27 Academia	2.58	3.75	3.00	3.17	2.50	1.50	6.67	8.75	12.10	5.50
EU-27 Company	1.31	3.98	4.98	8.53	9.00	7.61	9.25	6.50	10.50	10.50
Chinese Unknown	0.00	0.00	0.68	0.00	0.00	0.00	1.00	2.00	1.00	0.00
Chinese Individual	0.31	1.00	1.89	0.25	0.00	0.00	0.13	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	4.00	1.00
Chinese Company	0.13	2.83	1.18	0.00	0.00	0.00	0.00	4.00	1.00	0.00

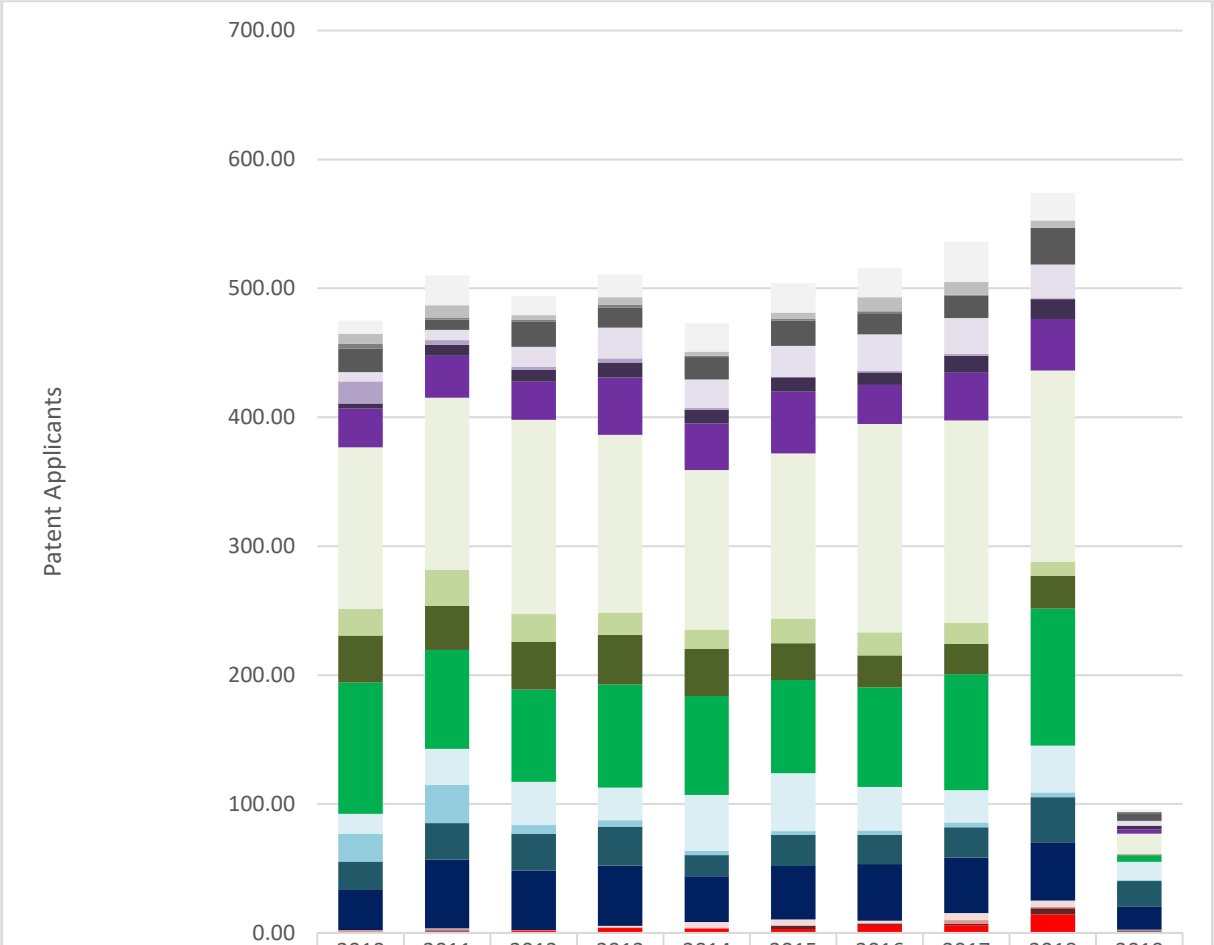
10.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER

10.4.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



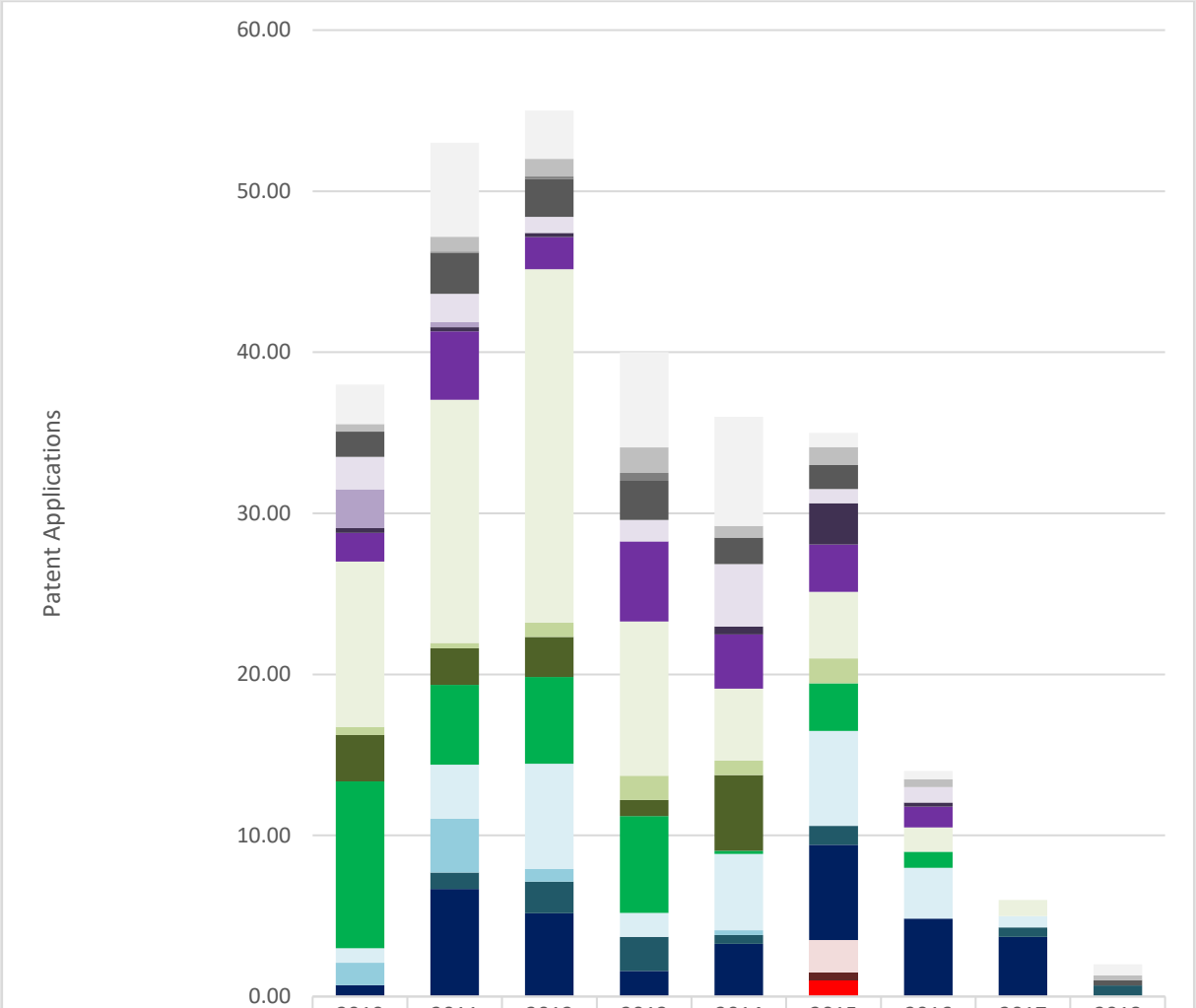
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	13.25	12.46	11.35	14.99	16.70	22.31	16.81	21.71	19.73	3.58
Unknown Individual	3.33	5.36	2.73	3.30	2.05	3.29	6.83	7.71	6.13	0.00
Unknown Academia	2.39	0.14	0.00	0.00	0.50	2.17	0.00	1.00	2.32	2.00
Unknown Company	4.12	4.93	9.89	5.49	6.35	8.87	7.20	10.91	16.68	1.83
Rest of World Unknown	5.07	4.69	9.77	15.96	18.55	22.00	21.96	21.40	20.91	6.92
Rest of World Individual	6.18	2.26	1.10	1.27	0.25	0.00	1.17	0.50	0.29	0.00
Rest of World Academia	1.72	1.33	1.50	3.43	4.49	3.74	7.50	5.46	5.88	1.95
Rest of World Company	6.33	10.43	21.49	13.99	15.44	22.01	19.89	26.37	24.74	5.80
American Unknown	58.63	74.83	81.83	89.87	78.63	82.53	104.78	91.86	98.44	17.63
American Individual	4.84	11.63	5.92	7.70	7.59	10.51	10.98	13.64	8.58	0.75
American Academia	6.73	8.42	15.71	17.91	6.68	13.73	9.88	8.74	10.17	1.50
American Company	38.37	32.22	22.48	42.45	29.39	35.65	48.58	53.30	71.78	7.88
EU-27 Unknown	1.57	6.54	6.42	10.01	9.83	14.83	11.72	11.26	18.72	3.83
EU-27 Individual	5.19	3.67	0.29	0.33	0.70	0.42	1.13	1.29	2.41	0.00
EU-27 Academia	3.45	5.08	2.60	2.52	3.22	3.17	1.42	2.31	7.18	0.33
EU-27 Company	4.84	16.97	8.94	7.95	14.04	9.78	8.48	17.64	14.28	0.83
Chinese Unknown	13.33	16.42	10.60	18.83	33.83	37.93	34.58	74.29	53.10	67.92
Chinese Individual	1.00	6.04	2.46	8.17	9.57	10.17	13.38	21.28	20.77	12.50
Chinese Academia	9.67	11.08	16.67	31.91	37.50	52.00	56.75	79.95	131.83	135.42
Chinese Company	14.00	29.49	9.27	15.92	19.70	26.90	29.97	66.38	69.07	70.33

10.4.2 Patent Applications in the EU Jurisdictions



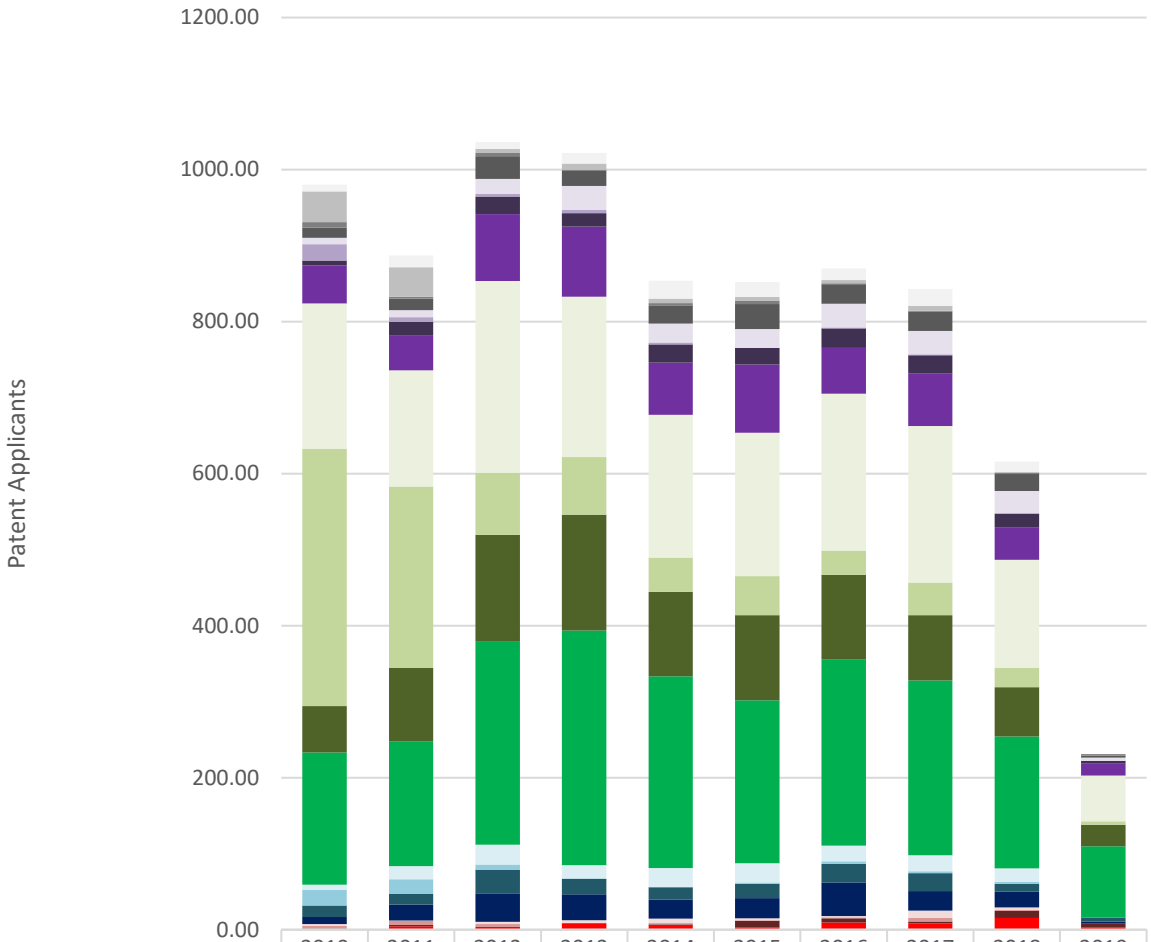
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	10.13	23.01	14.74	17.81	22.01	22.77	22.91	31.01	21.26	2.00
Unknown Individual	7.73	9.96	3.65	6.05	3.26	4.65	10.97	9.95	5.71	0.00
Unknown Academia	3.69	1.23	1.60	1.98	1.00	1.50	1.33	0.67	0.00	1.00
Unknown Company	18.28	7.88	19.41	15.71	17.49	19.70	16.35	17.28	28.46	6.00
Rest of World Unknown	7.35	8.03	15.60	23.73	21.88	24.31	28.40	27.94	26.11	3.75
Rest of World Individual	17.01	3.71	2.26	3.27	1.72	0.00	1.17	1.50	0.79	0.00
Rest of World Academia	4.12	8.44	9.17	11.63	10.39	11.27	9.67	13.21	15.38	2.95
Rest of World Company	29.87	32.49	29.55	44.48	36.26	47.93	30.43	36.90	40.07	3.30
American Unknown	125.47	133.51	150.79	137.69	123.64	127.91	161.67	156.90	148.20	15.25
American Individual	20.74	27.99	21.18	17.55	15.01	19.33	17.85	16.35	11.06	0.75
American Academia	36.43	34.12	37.35	38.48	36.63	28.46	24.83	23.72	25.42	0.83
American Company	101.77	76.80	71.40	79.76	76.57	72.29	77.16	89.74	106.30	4.92
EU-27 Unknown	15.52	28.02	33.69	25.47	43.49	44.92	33.83	25.03	36.20	14.31
EU-27 Individual	21.44	29.55	6.54	5.00	3.20	2.92	3.52	3.79	3.81	0.67
EU-27 Academia	22.03	28.37	28.58	30.09	16.42	24.00	22.58	23.73	34.86	19.59
EU-27 Company	31.09	53.44	46.25	46.91	35.43	41.54	43.92	42.89	45.28	18.18
Chinese Unknown	0.00	0.46	0.00	1.07	4.37	4.75	1.49	5.52	5.05	0.50
Chinese Individual	1.97	0.89	0.25	0.07	0.73	0.00	0.63	2.91	0.77	0.00
Chinese Academia	0.15	1.13	0.00	0.41	0.00	2.70	1.00	0.98	4.90	1.00
Chinese Company	0.20	1.00	2.00	3.85	3.50	3.05	6.31	5.98	14.38	1.00

10.4.3 Patent Applications in the Danish Jurisdiction



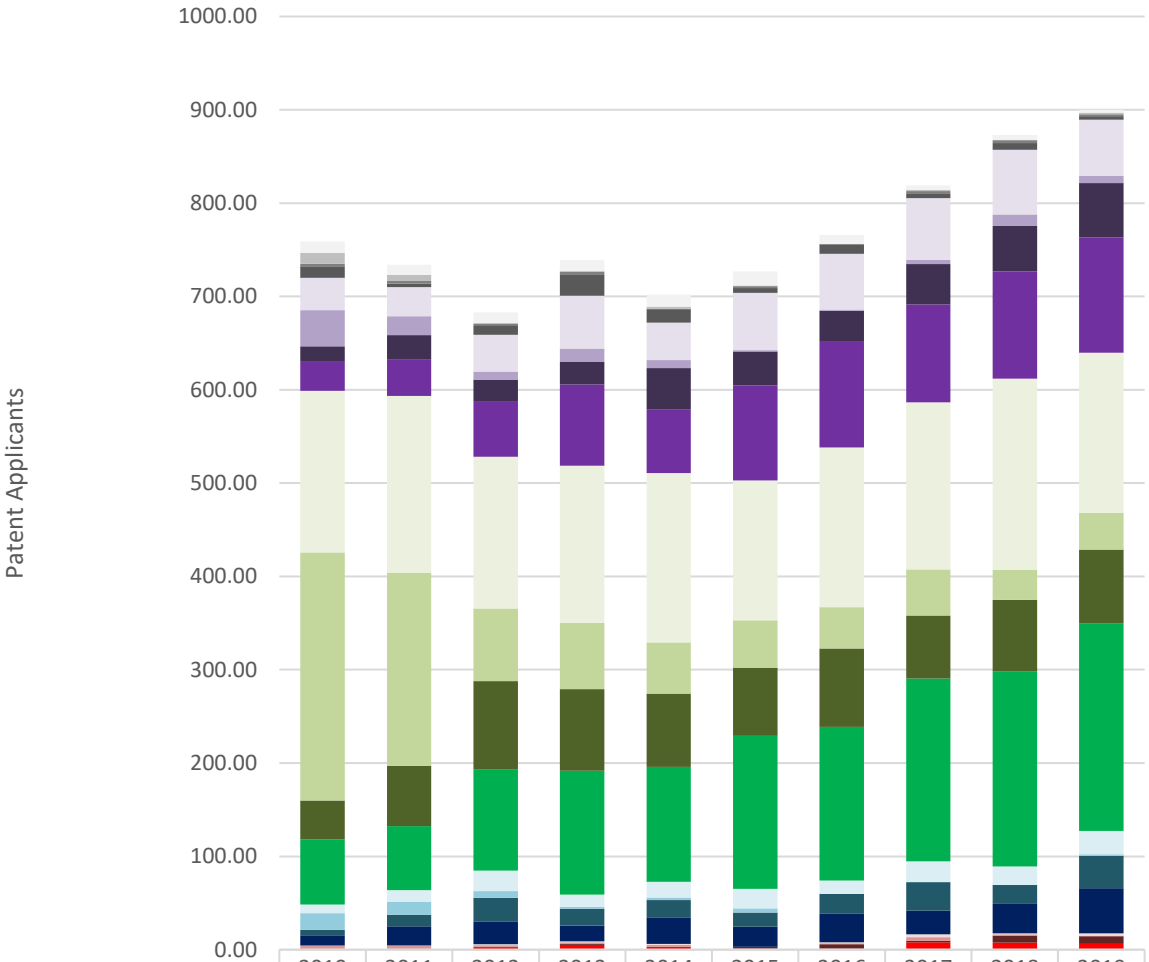
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Unknown Unknown	2.47	5.82	2.98	5.90	6.79	0.89	0.50	0.00	0.69
Unknown Individual	0.47	0.93	1.11	1.60	0.71	1.11	0.50	0.00	0.29
Unknown Academia	0.00	0.06	0.14	0.48	0.00	0.00	0.00	0.00	0.00
Unknown Company	1.57	2.55	2.36	2.44	1.64	1.50	0.00	0.00	0.34
Rest of World Unknown	2.01	1.75	1.00	1.33	3.89	0.88	0.96	0.00	0.00
Rest of World Individual	2.41	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.29	0.25	0.25	0.00	0.49	2.56	0.25	0.00	0.00
Rest of World Company	1.79	4.24	2.00	4.98	3.38	2.94	1.29	0.00	0.00
American Unknown	10.27	15.10	21.95	9.57	4.45	4.14	1.50	1.00	0.00
American Individual	0.50	0.33	0.89	1.50	0.90	1.54	0.00	0.00	0.00
American Academia	2.86	2.27	2.48	1.00	4.70	0.00	0.00	0.00	0.00
American Company	10.37	4.96	5.39	6.01	0.20	2.95	1.00	0.00	0.00
EU-27 Unknown	0.90	3.36	6.53	1.50	4.73	5.90	3.17	0.70	0.00
EU-27 Individual	1.40	3.34	0.79	0.00	0.30	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	1.01	1.97	2.11	0.54	1.18	0.00	0.60	0.69
EU-27 Company	0.70	6.69	5.17	1.59	3.28	5.93	4.83	3.70	0.00
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00

10.4.4 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	8.66	15.58	8.58	13.94	23.64	19.54	15.26	22.27	13.77	0.00
Unknown Individual	40.40	38.63	5.55	8.10	6.09	4.90	4.28	6.38	1.25	0.00
Unknown Academia	7.19	2.72	4.17	1.75	2.83	4.67	1.08	0.75	1.50	2.00
Unknown Company	13.35	14.82	30.06	19.90	24.10	32.50	25.83	25.89	22.20	2.50
Rest of World Unknown	8.69	9.47	19.82	31.38	24.62	25.17	31.21	30.77	29.04	4.25
Rest of World Individual	21.19	6.08	3.45	4.27	2.72	0.00	1.17	1.30	0.79	0.00
Rest of World Academia	6.30	18.28	22.75	17.62	23.89	21.90	25.92	23.68	17.67	3.95
Rest of World Company	50.40	45.49	88.40	92.35	68.79	89.52	59.88	69.24	43.26	15.67
American Unknown	191.17	153.01	251.91	211.07	187.90	188.48	206.42	206.13	142.04	60.20
American Individual	338.64	238.80	81.86	75.57	44.92	51.54	31.95	42.73	25.54	4.27
American Academia	60.92	96.58	140.54	152.37	111.32	111.86	111.91	86.09	64.98	28.40
American Company	173.86	163.70	266.97	308.99	252.08	214.40	244.64	229.89	173.39	93.93
EU-27 Unknown	6.72	17.35	26.29	17.06	24.66	25.56	20.47	21.07	17.68	0.00
EU-27 Individual	20.66	19.24	6.61	1.00	0.58	1.42	3.52	2.29	2.42	0.00
EU-27 Academia	15.08	14.12	31.09	20.13	16.37	18.96	24.30	23.65	10.43	5.00
EU-27 Company	9.15	20.88	37.52	33.85	24.94	26.52	44.10	25.58	20.65	2.00
Chinese Unknown	2.17	0.60	3.20	3.57	5.97	2.71	1.84	9.89	3.63	0.33
Chinese Individual	3.97	5.56	3.48	0.33	1.39	0.73	1.20	4.41	1.17	0.00
Chinese Academia	1.28	1.79	0.00	1.08	1.00	8.70	5.40	2.57	9.23	5.50
Chinese Company	0.20	4.31	3.77	7.68	6.20	2.94	9.64	8.42	15.38	3.00

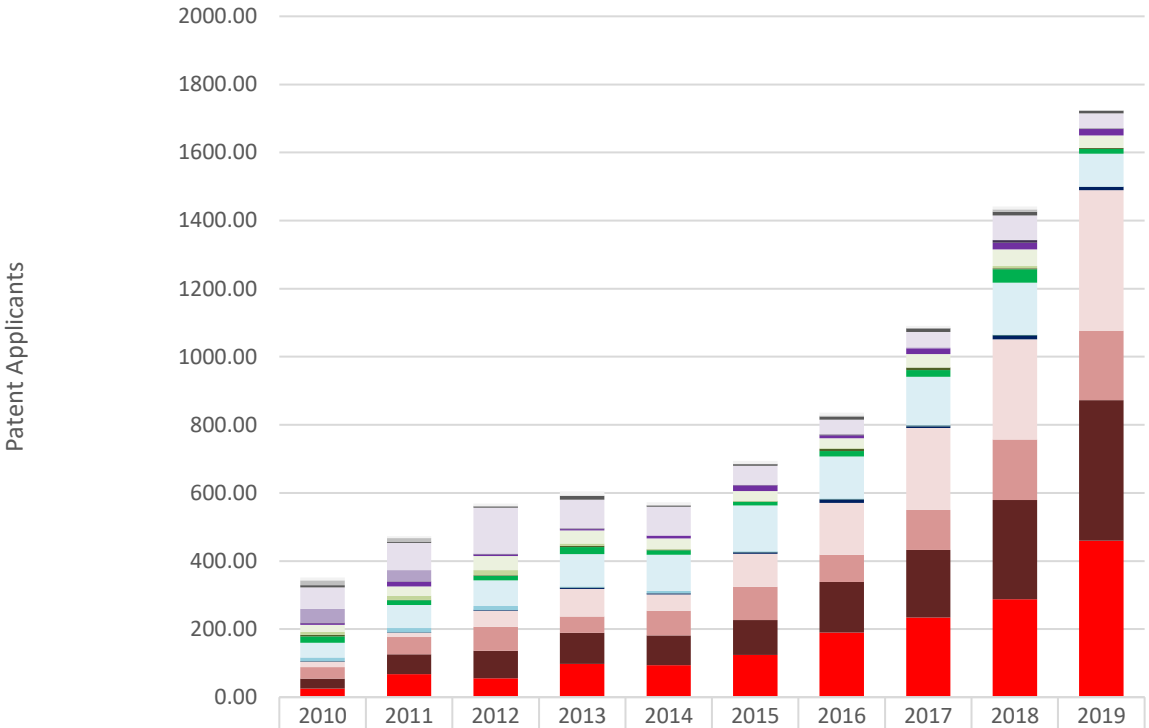
10.4.5 Patent Apllications in the Rest of the World



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	12.15	10.87	11.51	11.42	12.87	15.33	9.70	4.83	5.17	3.00
Unknown Individual	11.69	6.76	1.00	1.00	2.00	0.50	0.00	1.14	0.50	1.92
Unknown Academia	2.88	2.66	1.25	3.67	0.83	2.25	1.00	3.17	3.00	1.83
Unknown Company	12.41	3.81	10.25	22.08	14.50	5.00	9.50	4.50	7.00	3.75
Rest of World Unknown	34.41	31.09	39.58	56.70	39.96	61.47	59.90	66.13	69.50	60.07
Rest of World Individual	38.73	20.15	8.55	14.30	8.72	1.50	1.20	4.55	12.23	8.00
Rest of World Academia	16.03	25.87	22.92	24.00	44.52	36.08	33.27	43.25	48.92	58.32
Rest of World Company	31.82	39.41	59.60	87.34	67.74	101.93	113.25	104.80	114.60	123.25
American Unknown	173.26	189.35	162.74	168.41	181.64	149.91	171.22	179.06	205.01	171.73
American Individual	265.89	207.14	77.72	70.80	54.67	50.70	44.34	49.33	32.19	39.26
American Academia	41.63	64.39	94.51	87.56	78.84	73.04	83.89	67.74	76.33	79.09
American Company	69.85	68.60	108.59	132.84	122.93	164.06	164.68	195.81	209.33	222.65
EU-27 Unknown	9.23	12.47	21.89	13.04	17.00	20.90	14.42	22.05	19.93	25.01
EU-27 Individual	17.75	13.93	7.16	1.83	2.51	4.50	0.00	0.25	0.00	1.50
EU-27 Academia	6.45	12.60	25.70	18.37	18.54	15.23	21.16	30.70	20.10	34.87
EU-27 Company	10.25	20.52	24.07	16.83	28.54	21.43	30.73	25.28	31.68	48.17
Chinese Unknown	0.00	0.20	1.00	0.75	1.00	0.00	1.00	3.00	1.00	2.33
Chinese Individual	3.76	3.62	1.71	1.91	2.20	0.17	0.75	3.75	1.43	0.75
Chinese Academia	0.67	0.50	1.00	1.00	0.00	2.00	5.00	1.58	7.42	8.33
Chinese Company	0.14	0.08	2.25	5.17	3.00	1.00	1.00	8.08	7.67	6.17

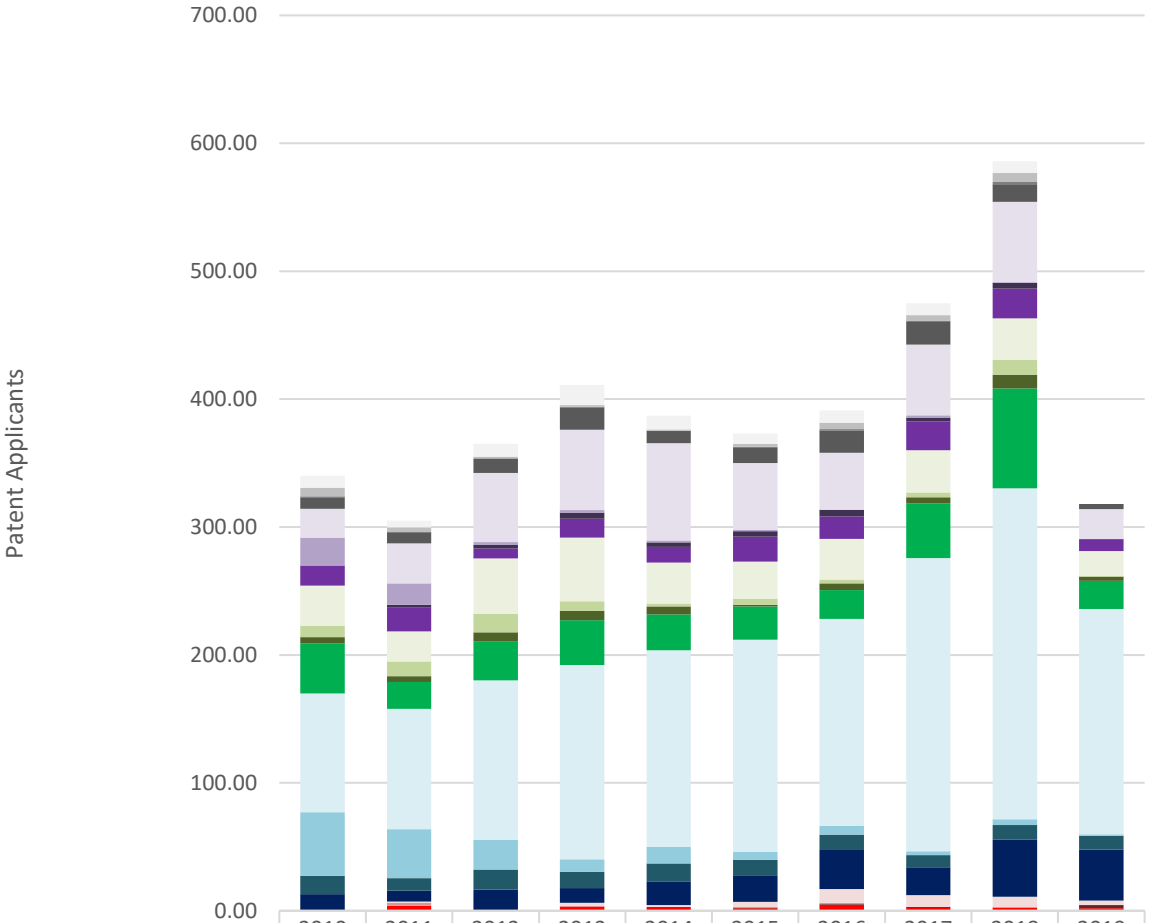
10.5 MEDICAL IMAGING

10.5.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



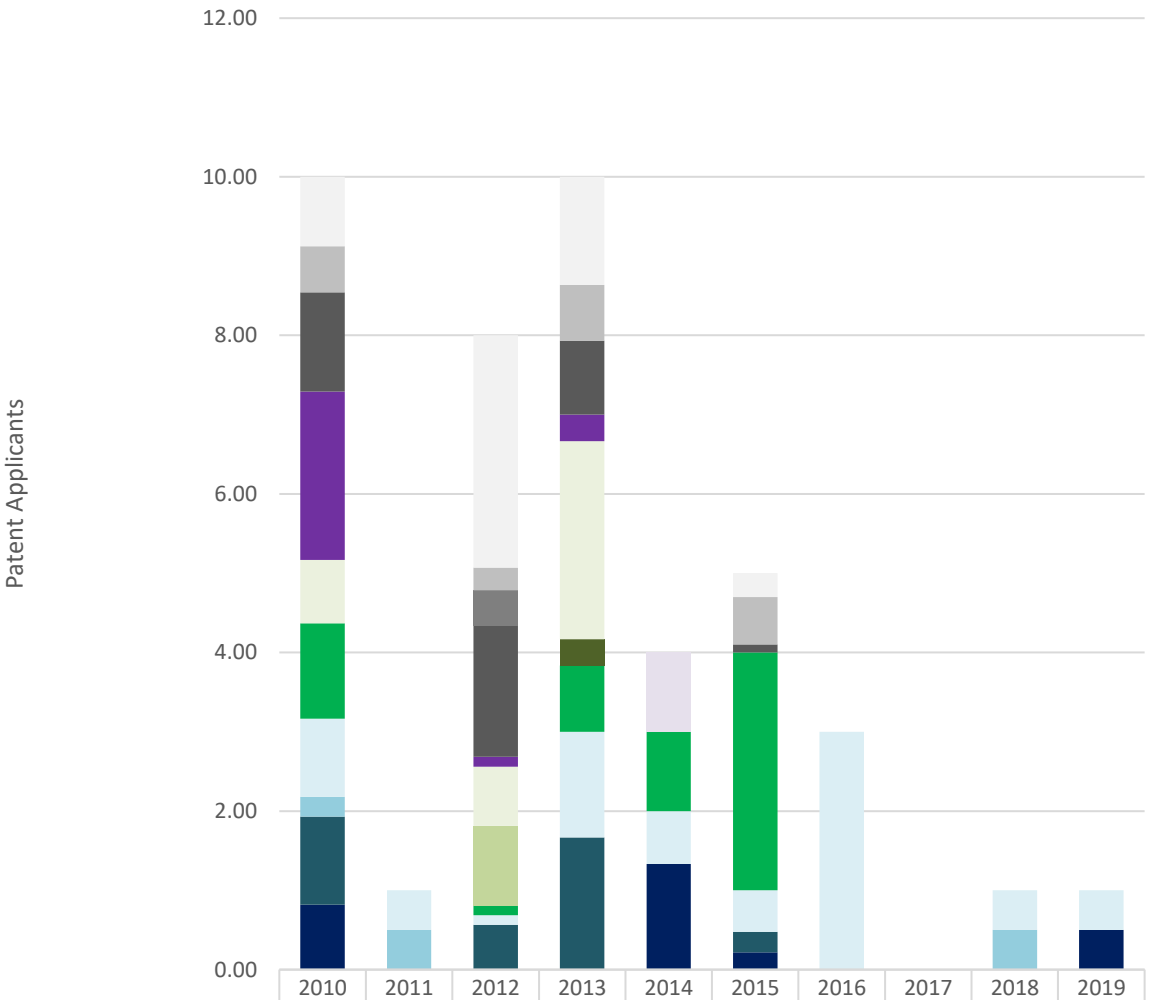
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	8.97	5.45	7.06	12.29	9.22	8.45	8.88	6.25	7.92	0.75
Unknown Individual	13.64	10.50	1.58	1.03	0.25	0.60	2.43	1.50	6.32	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.25	1.20	1.00
Unknown Company	7.09	3.46	3.87	11.73	3.78	5.44	9.93	9.92	10.33	7.00
Rest of World Unknown	63.18	80.12	134.26	83.28	85.23	55.13	42.67	45.50	71.83	44.92
Rest of World Individual	40.29	33.12	2.25	1.00	0.00	1.50	0.00	3.00	1.00	0.00
Rest of World Academia	1.33	0.83	1.03	2.10	0.00	0.17	3.33	0.00	6.92	1.25
Rest of World Company	5.28	13.75	4.08	3.31	8.35	16.70	8.50	17.12	20.17	18.92
American Unknown	19.95	27.75	41.35	38.46	30.74	28.47	28.95	38.57	48.91	36.50
American Individual	8.91	11.80	15.34	6.64	1.83	2.84	1.57	0.75	6.10	0.00
American Academia	4.96	1.35	2.13	3.75	1.83	0.25	6.75	6.95	3.63	3.00
American Company	18.53	14.37	13.28	21.24	13.37	11.27	15.65	19.95	39.28	14.17
EU-27 Unknown	43.04	66.94	75.15	94.48	105.94	134.24	123.27	142.17	152.96	97.17
EU-27 Individual	10.46	12.51	11.50	3.46	6.73	1.57	1.83	0.50	0.50	0.33
EU-27 Academia	0.64	1.13	0.83	1.21	1.40	1.83	1.67	2.92	2.71	0.29
EU-27 Company	1.73	0.88	1.86	3.00	2.33	3.72	10.07	5.25	10.50	9.55
Chinese Unknown	15.17	12.00	46.83	81.42	47.73	96.88	152.42	240.07	293.90	412.53
Chinese Individual	34.33	50.67	70.58	47.29	72.50	98.60	79.67	118.25	178.00	204.18
Chinese Academia	29.00	58.50	80.75	91.58	87.42	101.87	148.75	197.58	290.75	413.00
Chinese Company	25.50	67.87	55.30	97.71	94.35	124.32	189.67	234.52	288.08	459.45

10.5.2 Patent Applications in the EU Jurisdictions



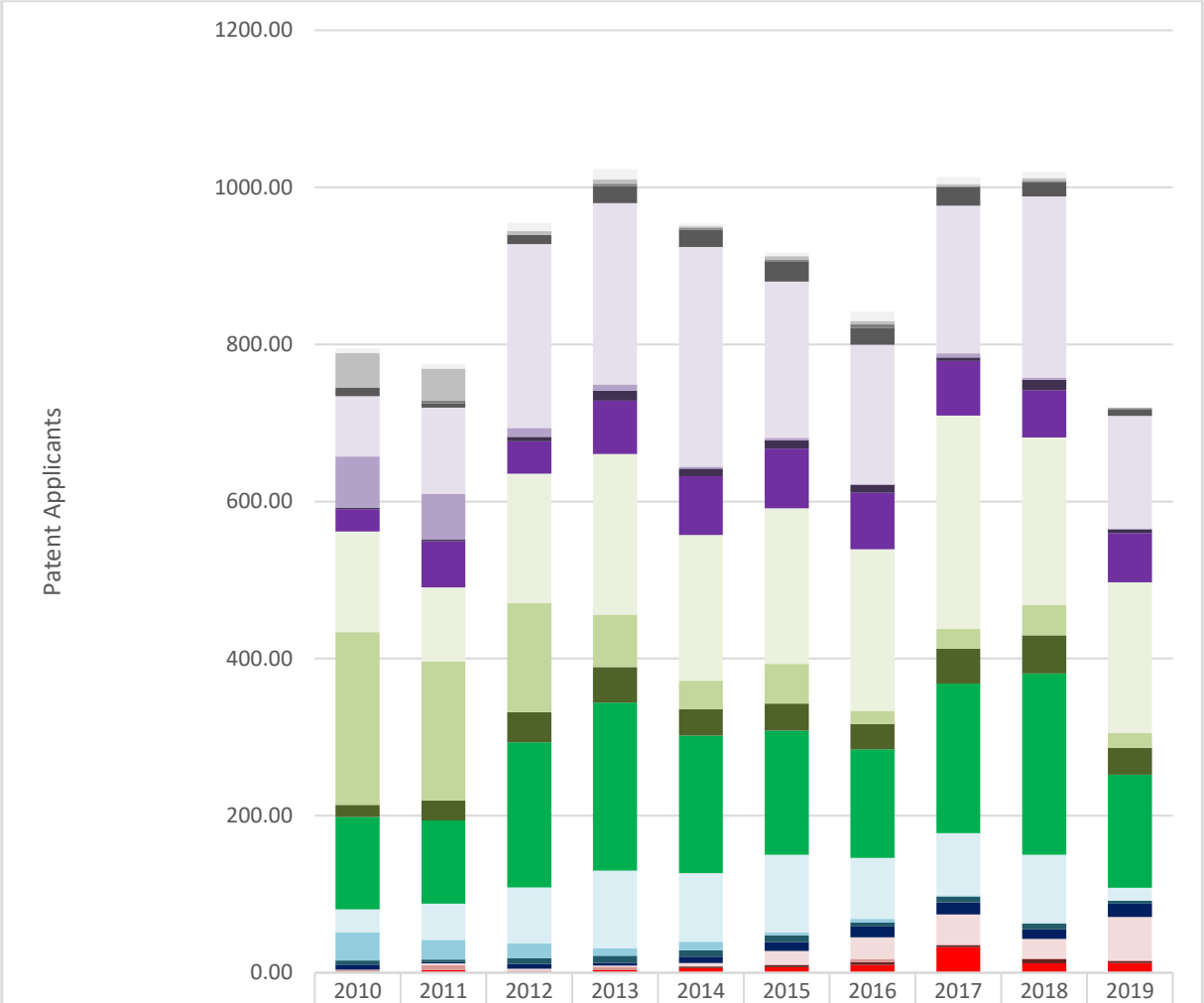
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	9.24	5.21	9.86	15.56	10.72	7.87	9.30	9.26	9.33	0.00
Unknown Individual	6.84	3.87	1.44	1.43	0.99	2.32	5.18	4.43	6.78	0.00
Unknown Academia	0.75	0.00	0.52	0.37	0.25	0.98	1.00	0.34	1.87	0.00
Unknown Company	8.89	8.56	10.89	17.66	9.37	11.76	17.35	18.23	13.69	4.00
Rest of World Unknown	22.52	31.37	53.98	62.70	76.25	52.33	44.75	55.50	62.95	23.17
Rest of World Individual	21.80	16.85	2.21	2.00	1.53	1.00	0.00	1.67	0.50	0.00
Rest of World Academia	0.25	2.21	2.79	4.82	3.38	4.33	5.17	3.00	4.42	0.25
Rest of World Company	15.39	18.55	7.88	14.63	12.25	19.33	17.58	22.45	23.33	9.42
American Unknown	31.65	23.40	43.37	49.83	32.01	29.22	31.62	33.16	32.60	19.17
American Individual	8.74	11.58	14.28	7.51	2.23	4.67	2.98	3.59	11.46	0.67
American Academia	5.13	4.52	7.35	7.39	6.33	1.25	5.25	4.95	10.83	3.33
American Company	38.85	21.10	30.37	35.02	28.09	26.11	22.65	42.68	77.95	22.00
EU-27 Unknown	92.86	93.92	124.45	151.72	153.67	165.77	161.83	229.29	258.86	176.33
EU-27 Individual	49.87	38.50	23.36	9.96	12.89	6.40	6.93	2.83	4.50	1.25
EU-27 Academia	14.23	9.76	15.77	12.71	14.14	12.45	11.83	9.61	11.13	10.62
EU-27 Company	12.99	8.47	16.23	11.54	18.39	20.20	30.57	21.76	44.81	39.80
Chinese Unknown	0.00	0.99	0.00	2.60	1.43	4.17	10.75	9.17	7.85	3.67
Chinese Individual	0.00	2.27	0.00	0.14	0.00	0.50	1.00	0.25	0.70	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.67	0.00	2.33
Chinese Company	0.00	3.87	0.25	3.40	3.07	1.83	4.75	2.17	2.45	2.00

10.5.3 Patent Applications in the Danish Jurisdiction



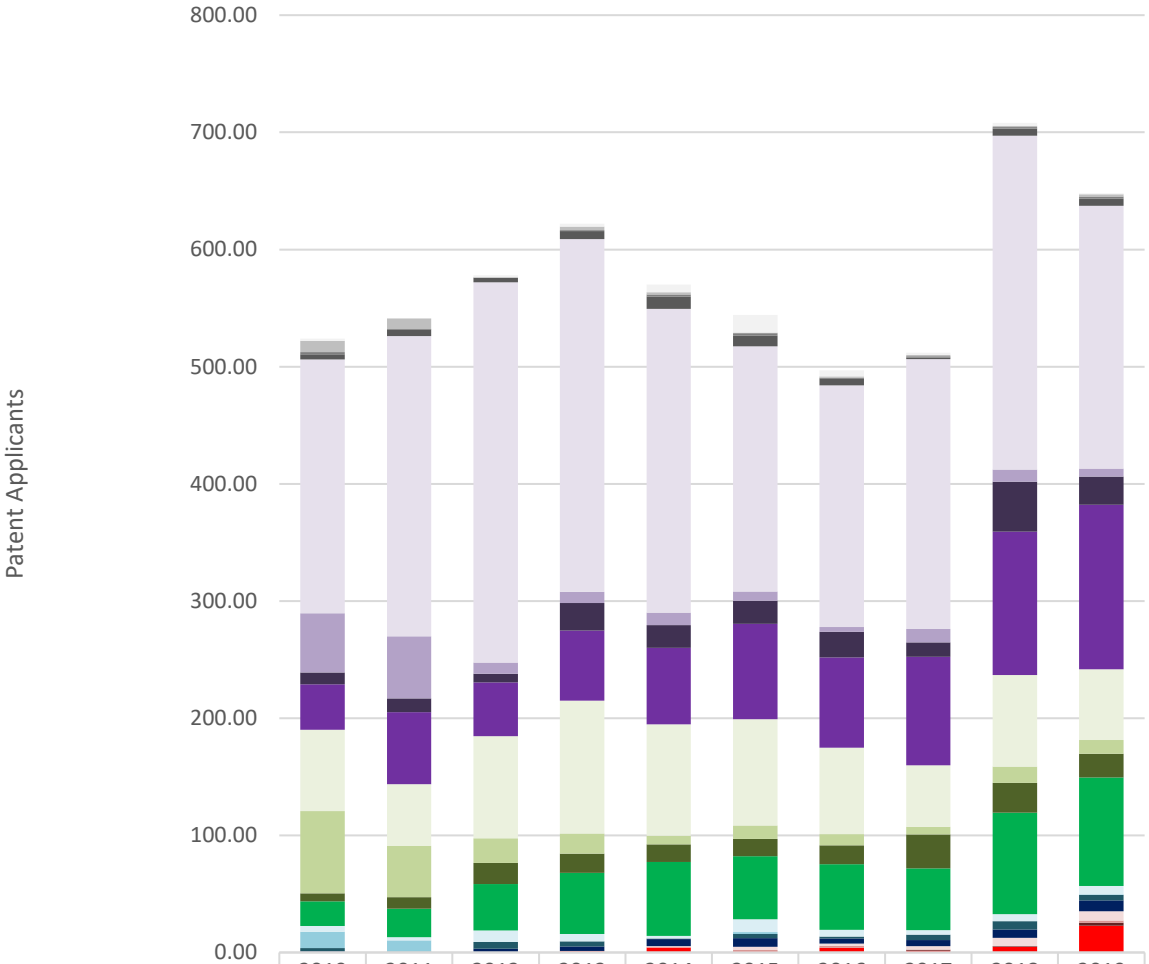
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	0.88	0.00	2.93	1.37	0.00	0.30	0.00	0.00	0.00	0.00
Unknown Individual	0.58	0.00	0.29	0.70	0.00	0.60	0.00	0.00	0.00	0.00
Unknown Academia	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	1.25	0.00	1.65	0.93	0.00	0.10	0.00	0.00	0.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Company	2.13	0.00	0.13	0.33	0.00	0.00	0.00	0.00	0.00	0.00
American Unknown	0.80	0.00	0.75	2.50	0.00	0.00	0.00	0.00	0.00	0.00
American Individual	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Academia	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
American Company	1.20	0.00	0.13	0.83	1.00	3.00	0.00	0.00	0.00	0.00
EU-27 Unknown	0.99	0.50	0.12	1.33	0.67	0.52	3.00	0.00	0.50	0.50
EU-27 Individual	0.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
EU-27 Academia	1.11	0.00	0.56	1.67	0.00	0.26	0.00	0.00	0.00	0.00
EU-27 Company	0.82	0.00	0.00	0.00	1.33	0.22	0.00	0.00	0.00	0.50
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

10.5.4 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	6.09	5.90	10.55	12.79	3.67	4.78	12.17	9.04	8.20	1.00
Unknown Individual	43.74	40.56	4.46	5.81	2.53	4.52	3.93	2.53	3.67	0.00
Unknown Academia	0.33	3.34	0.45	3.00	1.93	2.00	5.33	0.75	1.20	2.00
Unknown Company	10.87	5.66	12.02	21.43	21.77	25.81	21.13	24.07	18.53	8.00
Rest of World Unknown	76.54	109.42	233.87	230.78	279.87	198.70	177.42	187.90	230.53	143.50
Rest of World Individual	65.09	58.73	11.51	8.16	2.53	3.53	0.93	5.40	2.92	0.88
Rest of World Academia	2.29	2.15	5.32	12.56	9.64	10.23	9.83	4.20	13.25	5.00
Rest of World Company	28.16	58.58	41.48	67.94	74.50	75.98	71.89	69.85	60.08	62.60
American Unknown	128.31	94.74	164.94	204.71	185.93	198.15	205.90	271.58	213.13	192.08
American Individual	219.85	176.35	138.64	66.73	36.29	50.70	16.78	25.03	38.74	18.80
American Academia	15.40	25.57	38.24	45.33	33.67	34.28	32.20	44.42	48.67	34.08
American Company	117.76	106.11	184.78	213.74	174.90	158.03	138.16	190.43	231.02	144.06
EU-27 Unknown	29.56	46.11	71.19	99.14	87.14	99.01	77.88	79.34	86.60	16.50
EU-27 Individual	35.23	24.88	18.67	9.13	11.18	3.90	4.43	1.50	1.00	0.00
EU-27 Academia	5.57	3.17	7.86	9.47	8.10	8.34	5.25	7.20	7.09	3.54
EU-27 Company	6.51	1.69	6.12	3.00	7.86	11.12	13.73	15.34	12.48	16.96
Chinese Unknown	0.50	2.57	2.20	1.60	3.93	17.67	27.33	38.50	24.58	55.17
Chinese Individual	2.20	5.85	1.47	3.92	0.75	0.25	4.20	1.08	1.20	1.00
Chinese Academia	0.00	0.00	0.00	0.25	2.00	3.00	3.50	2.17	5.00	2.50
Chinese Company	1.00	3.62	1.25	3.53	5.82	7.00	10.00	32.67	12.12	12.33

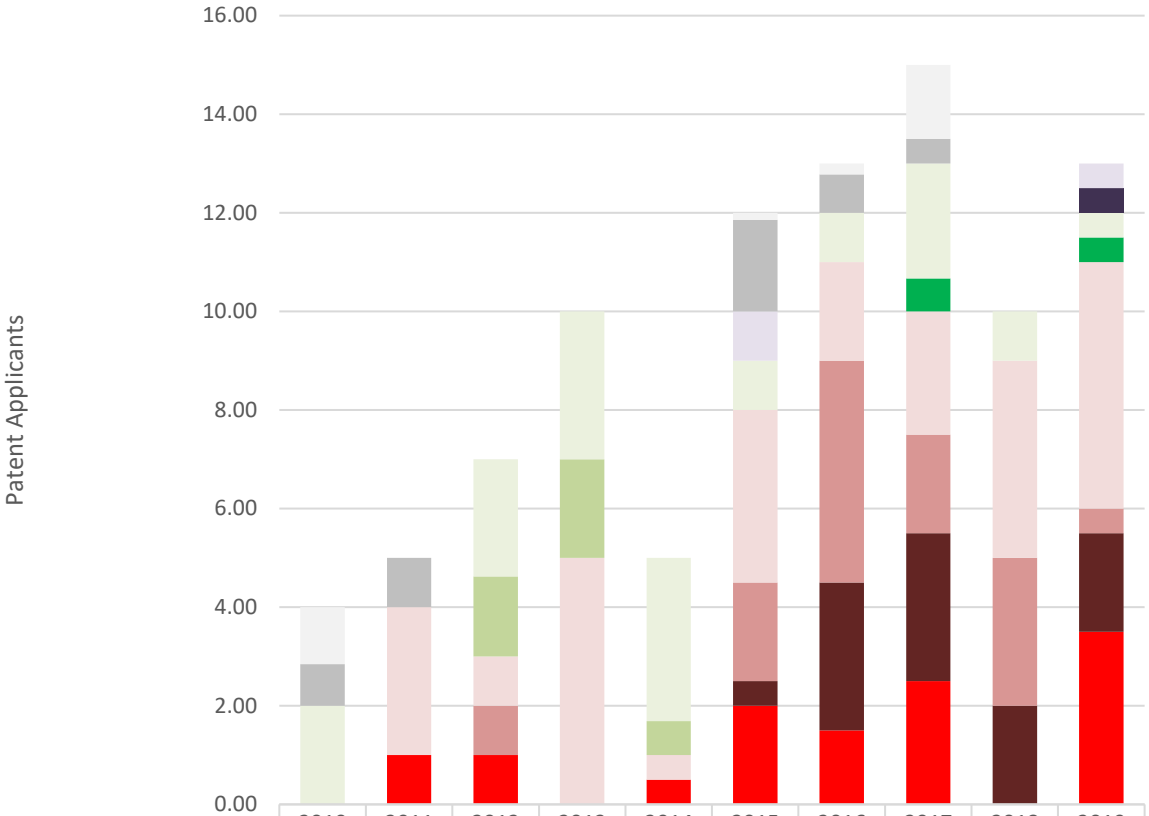
10.5.5 Patent Applications in the rest of the World



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	2.13	0.00	1.83	2.45	6.33	15.00	5.33	2.00	2.50	1.00
Unknown Individual	9.32	8.96	0.00	2.93	2.00	0.50	1.00	1.00	1.00	1.67
Unknown Academia	2.00	0.13	0.00	1.00	2.00	2.00	0.50	1.20	1.33	2.00
Unknown Company	4.29	5.83	4.17	6.87	10.33	9.00	6.00	1.50	6.00	6.00
Rest of World Unknown	216.64	256.27	324.66	300.92	259.32	209.50	206.40	230.08	285.06	224.42
Rest of World Individual	50.51	52.89	9.32	9.63	10.63	7.92	4.17	11.52	10.25	6.83
Rest of World Academia	10.24	11.79	7.49	23.37	19.30	19.50	21.75	12.25	42.59	23.83
Rest of World Company	38.70	61.43	46.03	59.78	65.32	81.62	77.02	92.57	122.35	140.58
American Unknown	69.45	52.86	86.94	113.35	95.20	90.62	73.83	52.45	78.38	60.41
American Individual	70.16	43.66	21.17	17.30	7.30	11.45	9.42	6.62	13.83	11.70
American Academia	7.03	9.82	17.90	16.55	15.00	14.79	16.33	29.00	25.25	20.06
American Company	20.97	24.42	39.62	51.94	63.17	53.87	55.92	52.68	86.79	92.74
EU-27 Unknown	4.88	2.54	9.83	6.30	2.02	10.70	5.67	3.90	6.00	7.08
EU-27 Individual	13.97	9.57	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.50
EU-27 Academia	2.56	0.84	5.83	4.50	0.75	3.65	1.67	4.70	7.17	4.75
EU-27 Company	0.53	0.00	3.00	3.70	6.00	7.15	4.33	5.03	7.00	9.17
Chinese Unknown	0.00	0.00	0.00	0.00	1.00	3.00	2.00	3.00	7.00	8.00
Chinese Individual	0.62	0.00	0.20	0.42	0.00	1.00	1.67	0.00	0.00	2.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.50	2.25
Chinese Company	0.00	0.00	0.00	1.00	4.33	1.00	4.00	1.50	5.00	23.00

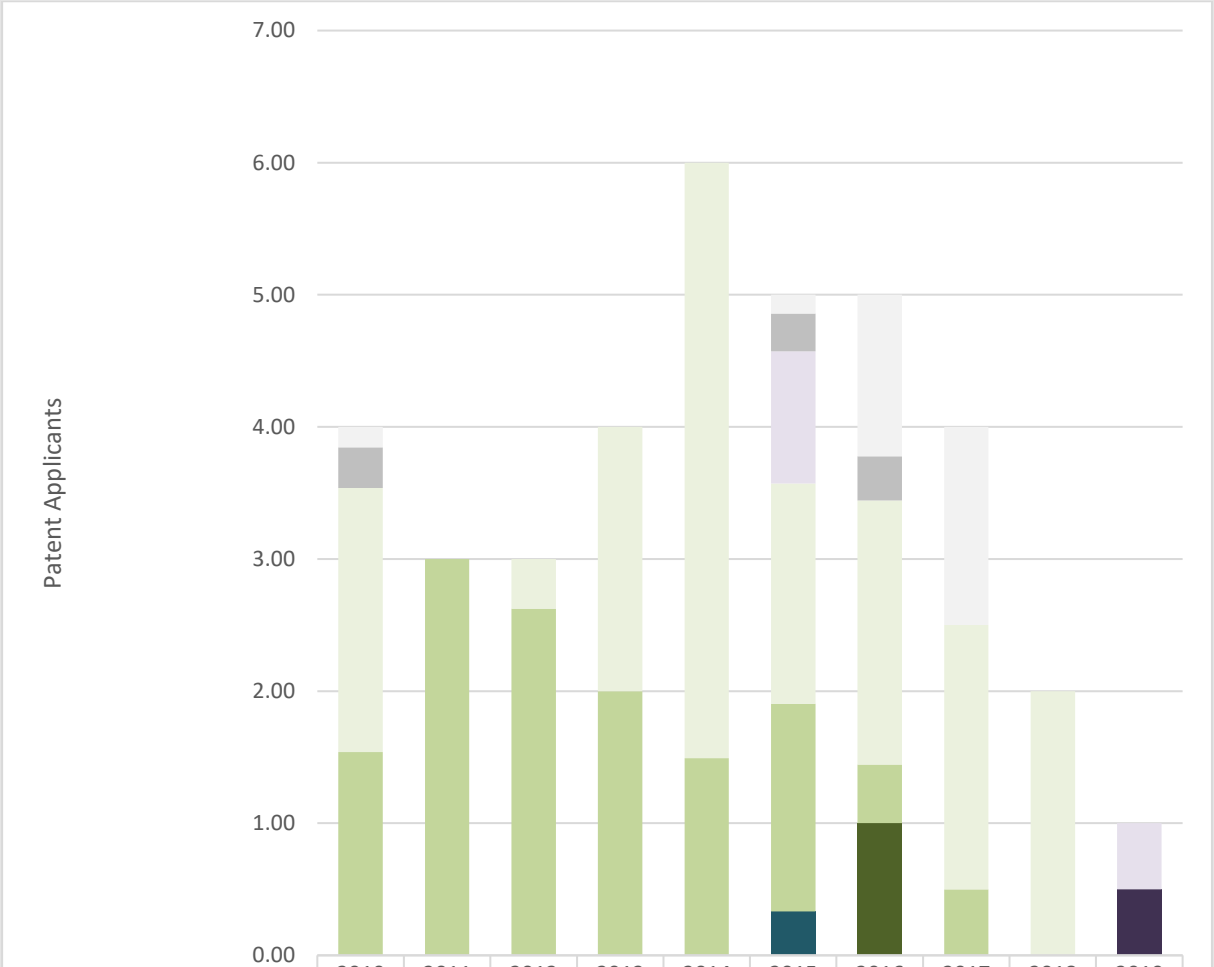
10.6 TRADITIONAL CHINESE MEDICINE

10.6.1 Patent Applications in the Chinese Jurisdiction (CNIPA)



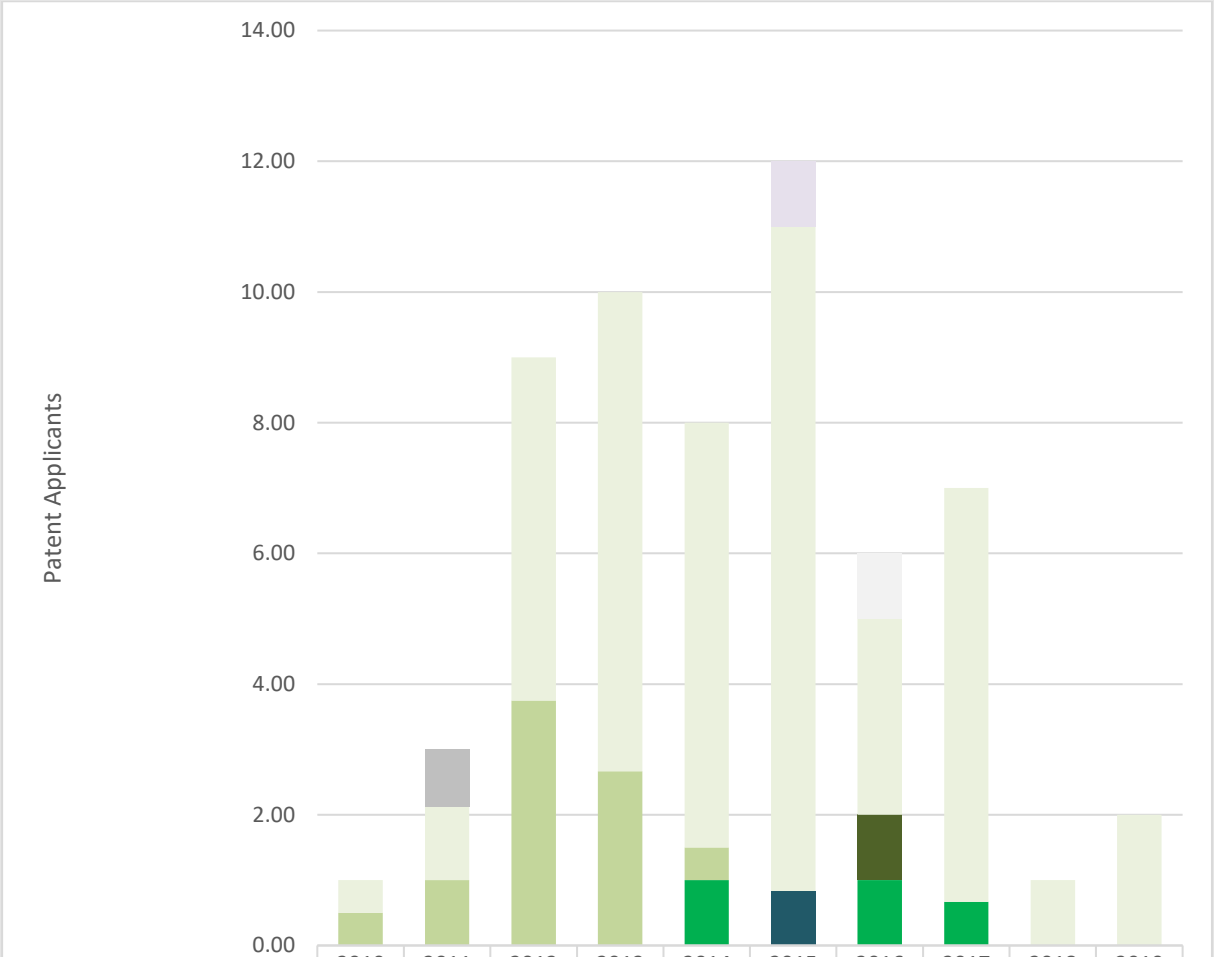
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	1.15	0.00	0.00	0.00	0.00	0.14	0.22	1.50	0.00	0.00
Unknown Individual	0.85	1.00	0.00	0.00	0.00	1.86	0.78	0.50	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Rest of World Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Unknown	2.00	0.00	2.38	3.00	3.31	1.00	1.00	2.33	1.00	0.50
American Individual	0.00	0.00	1.63	2.00	0.69	0.00	0.00	0.00	0.00	0.00
American Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.50
EU-27 Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Unknown	0.00	3.00	1.00	5.00	0.50	3.50	2.00	2.50	4.00	5.00
Chinese Individual	0.00	0.00	1.00	0.00	0.00	2.00	4.50	2.00	3.00	0.50
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.50	3.00	3.00	2.00	2.00
Chinese Company	0.00	1.00	1.00	0.00	0.50	2.00	1.50	2.50	0.00	3.50

10.6.2 Patent Applications in the EU Jurisdictions



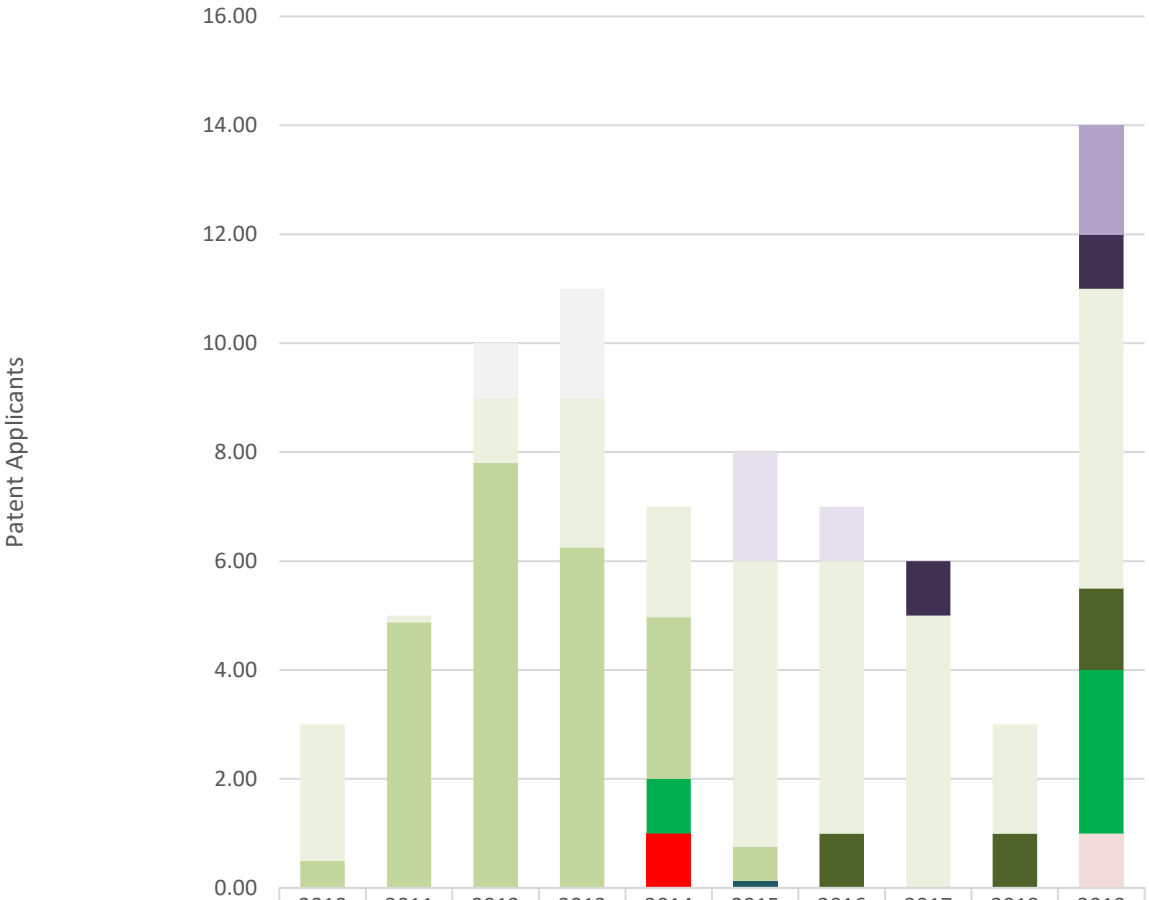
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	0.15	0.00	0.00	0.00	0.00	0.14	1.22	1.50	0.00	0.00
Unknown Individual	0.31	0.00	0.00	0.00	0.00	0.29	0.33	0.00	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Rest of World Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Unknown	2.00	0.00	0.38	2.00	4.51	1.67	2.00	2.00	2.00	0.00
American Individual	1.54	3.00	2.63	2.00	1.49	1.57	0.44	0.50	0.00	0.00
American Academia	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
American Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
EU-27 Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

10.6.3 Patent Applications in the US Jurisdiction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
Unknown Individual	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Unknown	0.50	1.13	5.25	7.33	6.50	10.17	3.00	6.33	1.00	2.00
American Individual	0.50	1.00	3.75	2.67	0.50	0.00	0.00	0.00	0.00	0.00
American Academia	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
American Company	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.67	0.00	0.00
EU-27 Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00
EU-27 Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

10.6.4 Patent Applications in the rest of the World

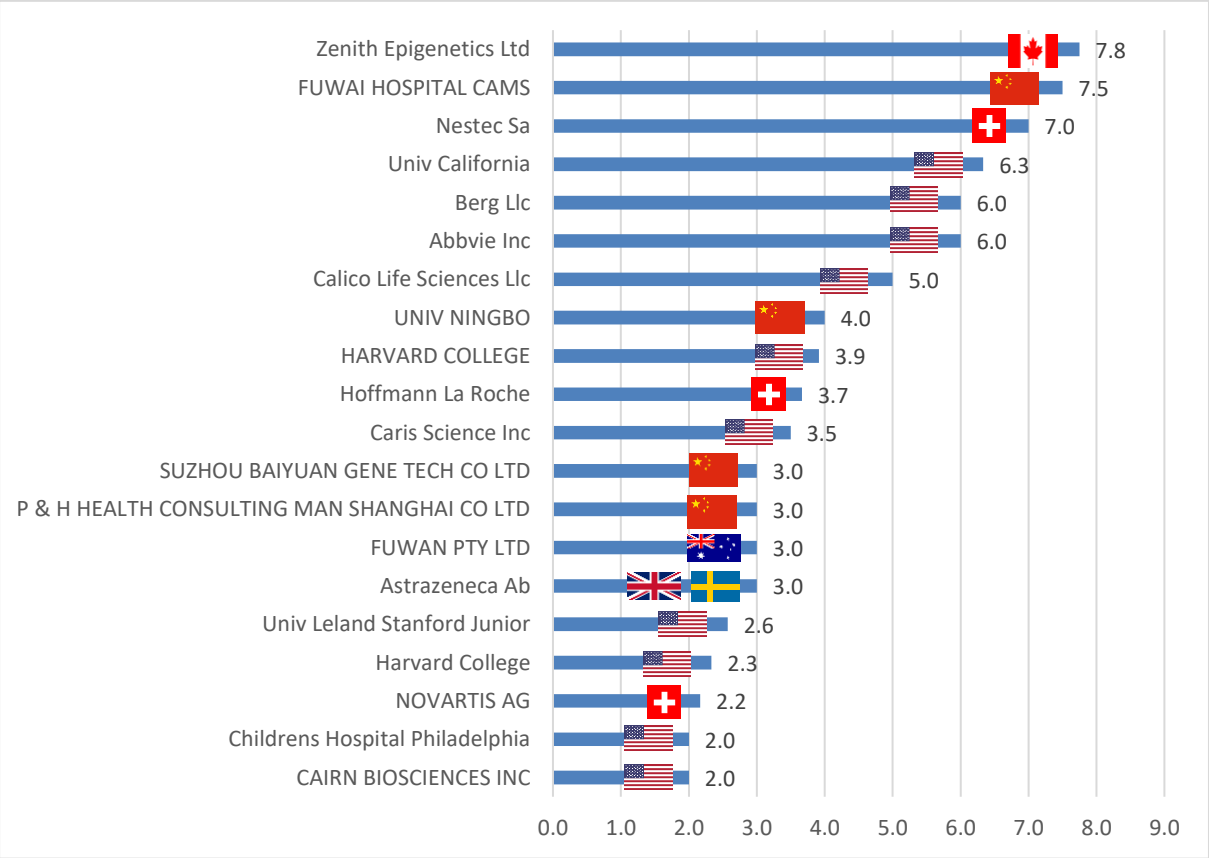


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unknown Unknown	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rest of World Unknown	0.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00	0.00	0.00
Rest of World Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Rest of World Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Rest of World Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
American Unknown	2.50	0.13	1.20	2.75	2.03	5.25	5.00	5.00	2.00	5.50
American Individual	0.50	4.88	7.80	6.25	2.97	0.63	0.00	0.00	0.00	0.00
American Academia	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.50
American Company	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00
EU-27 Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU-27 Academia	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00
EU-27 Company	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Unknown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Chinese Individual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Academia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Company	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

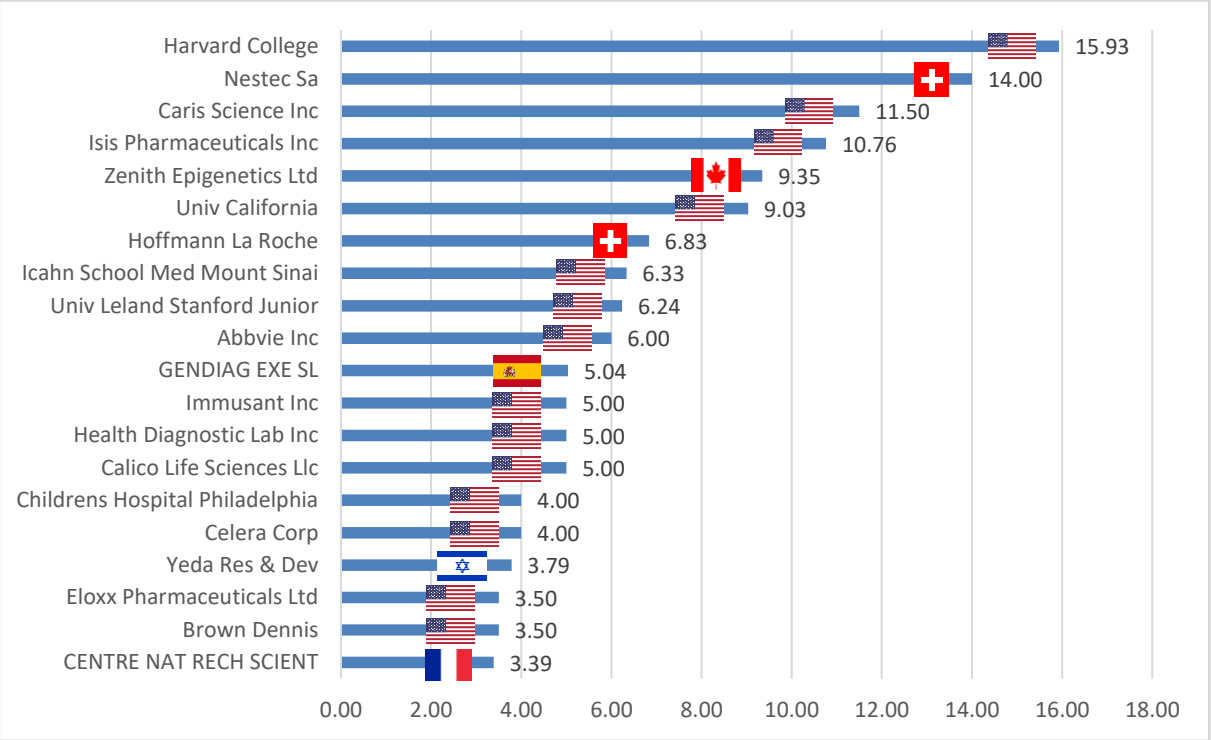
11 TOP 20 PATENT APPLICANTS WORLDWIDE 2010-2019

11.1 GENOME STUDY FOR CARDIOVASCULAR DISEASE

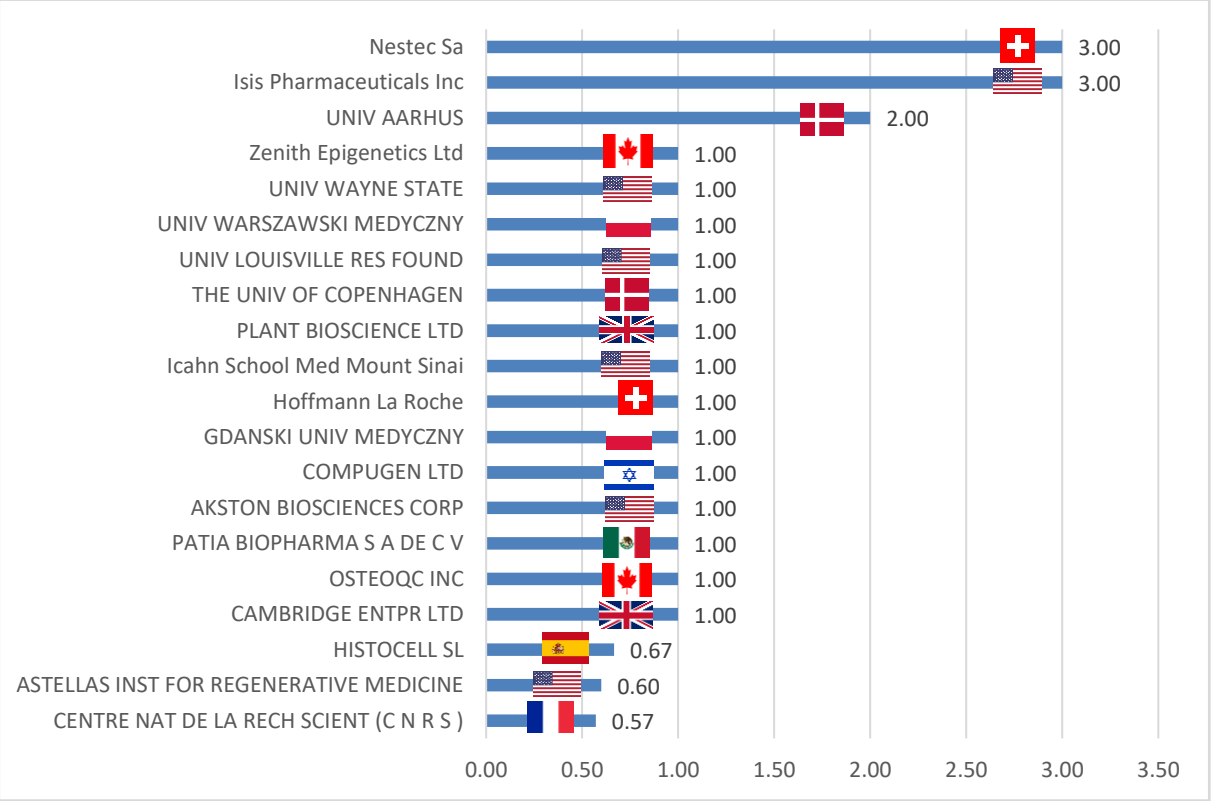
11.1.1 Chinese Jurisdiction



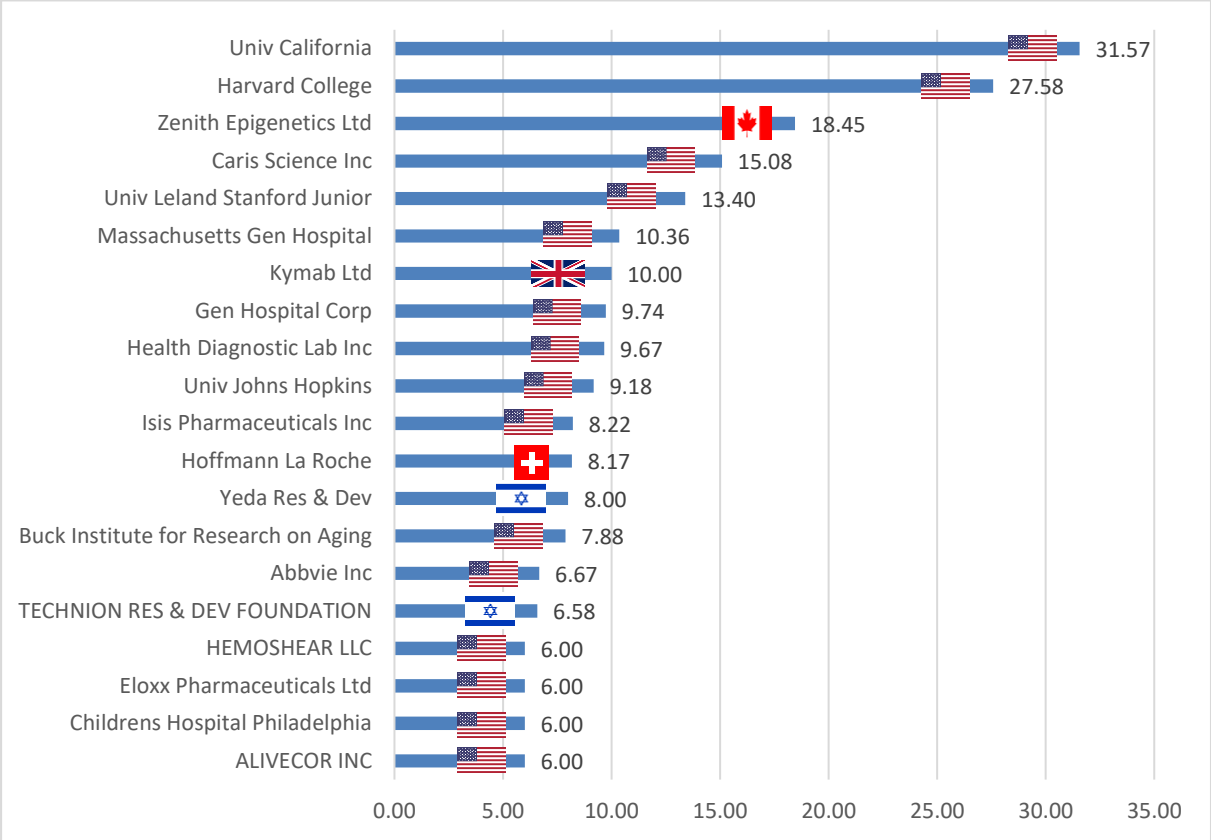
11.1.2 EU Jurisdictions



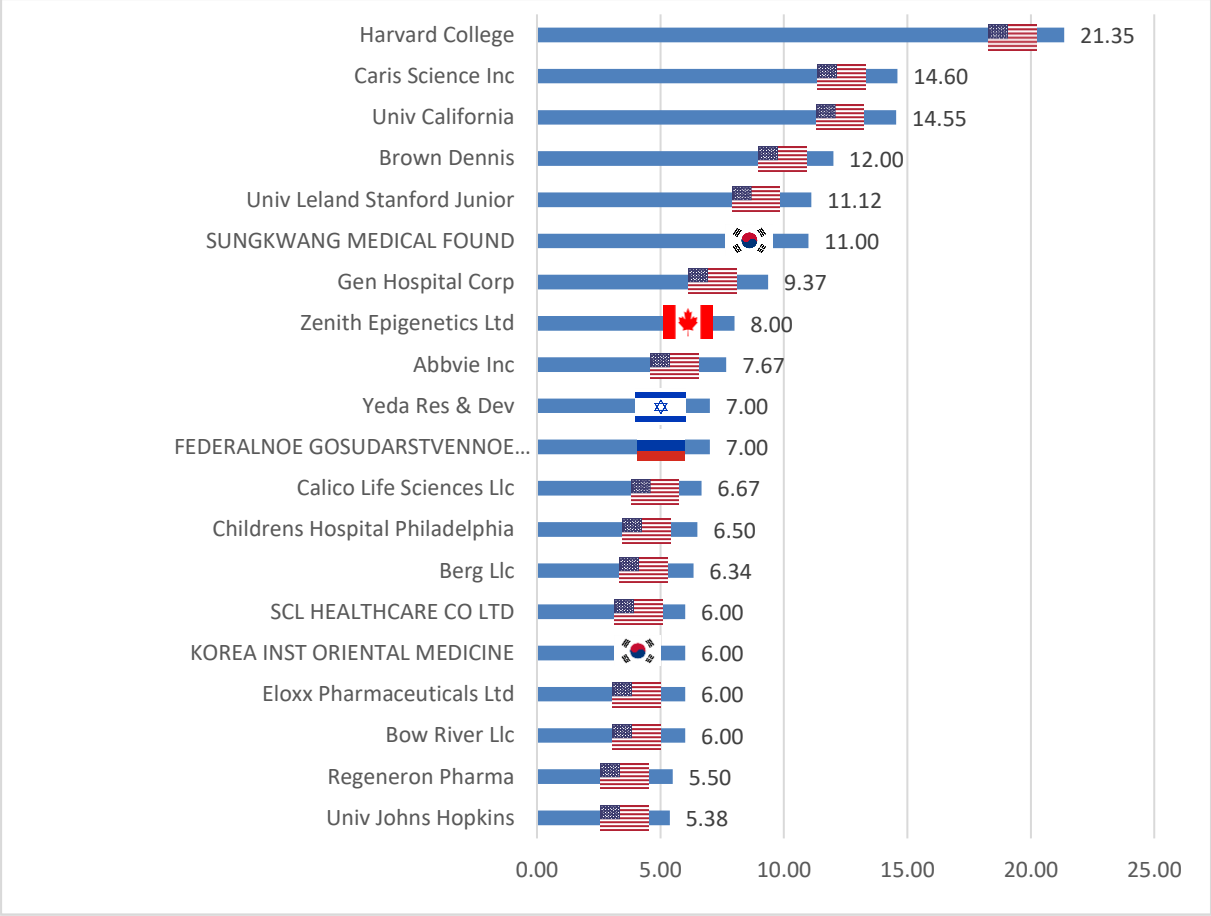
11.1.3 Danish Jurisdiction



11.1.4 US Jurisdiction

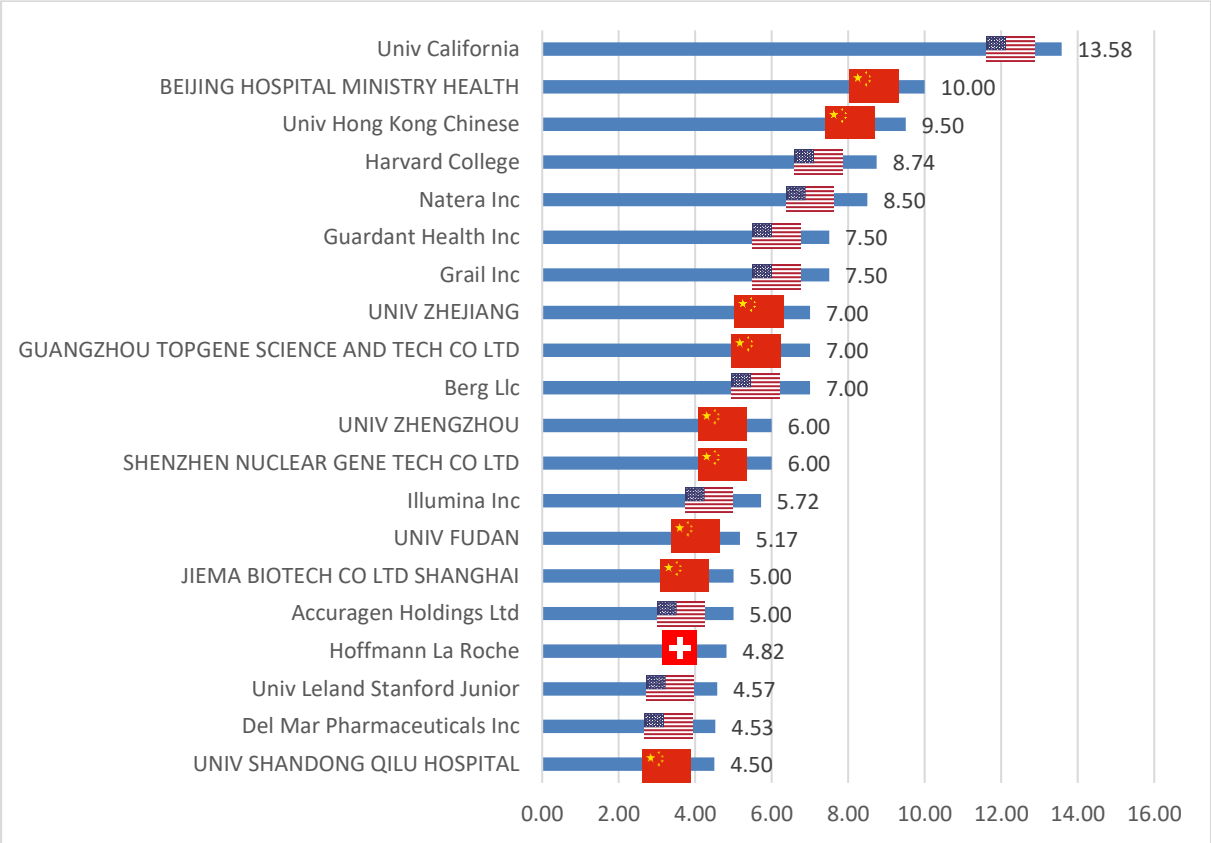


11.1.5 Rest of the World

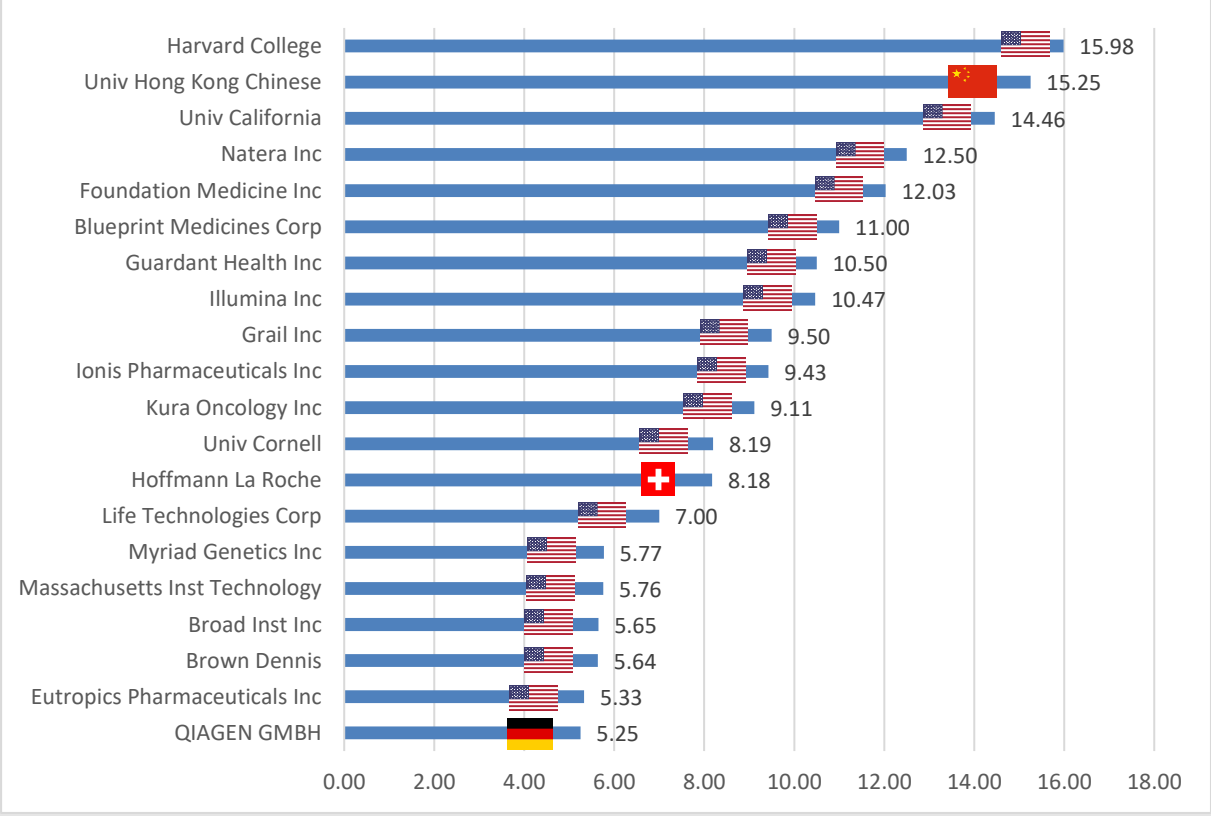


11.2 GENOME STUDY FOR CANCER

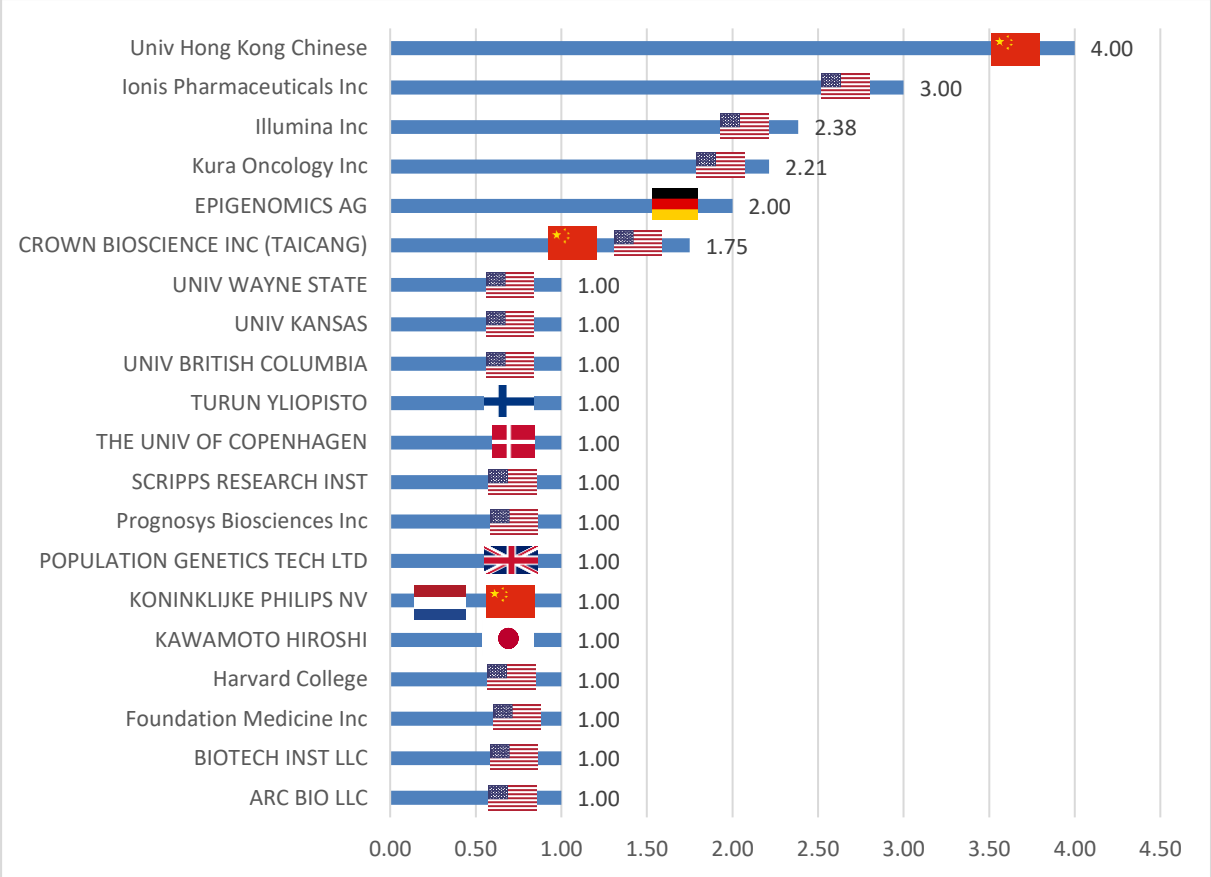
11.2.1 Chinese Jurisdiction



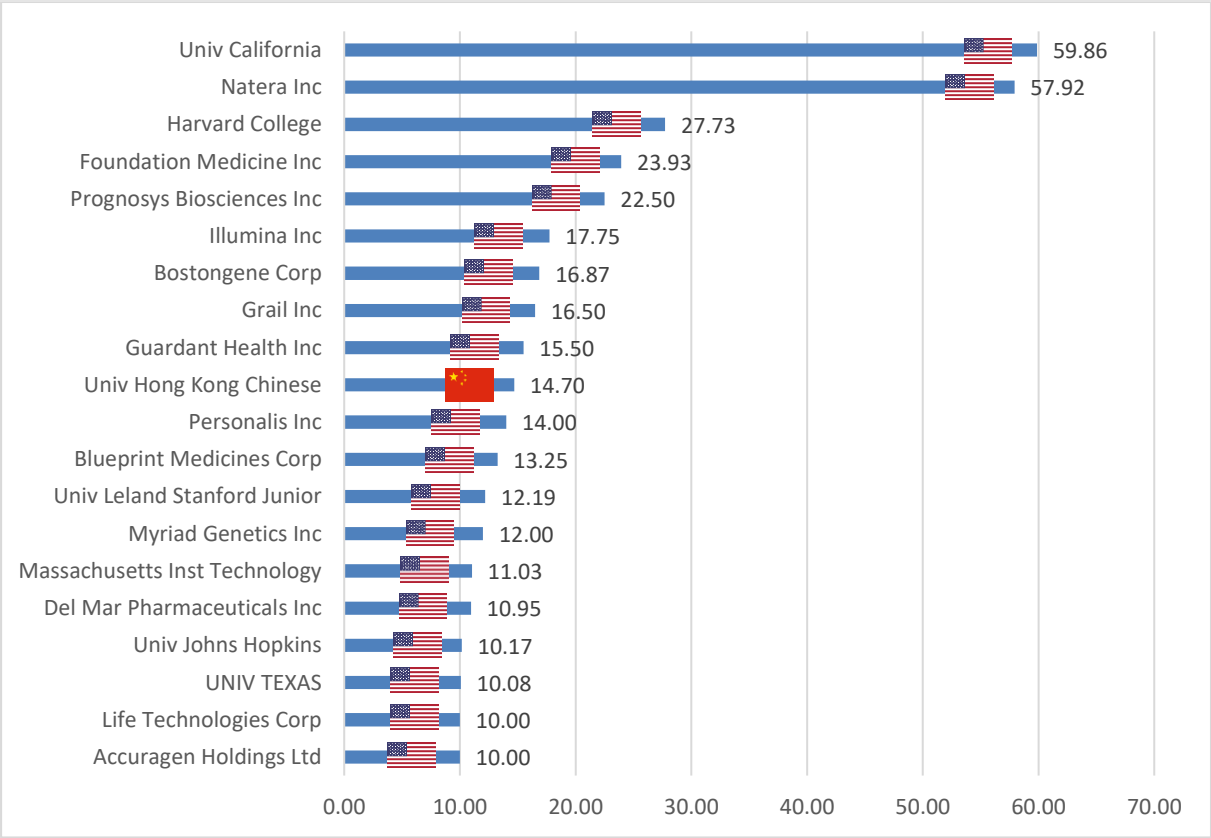
11.2.2 EU Jurisdictions



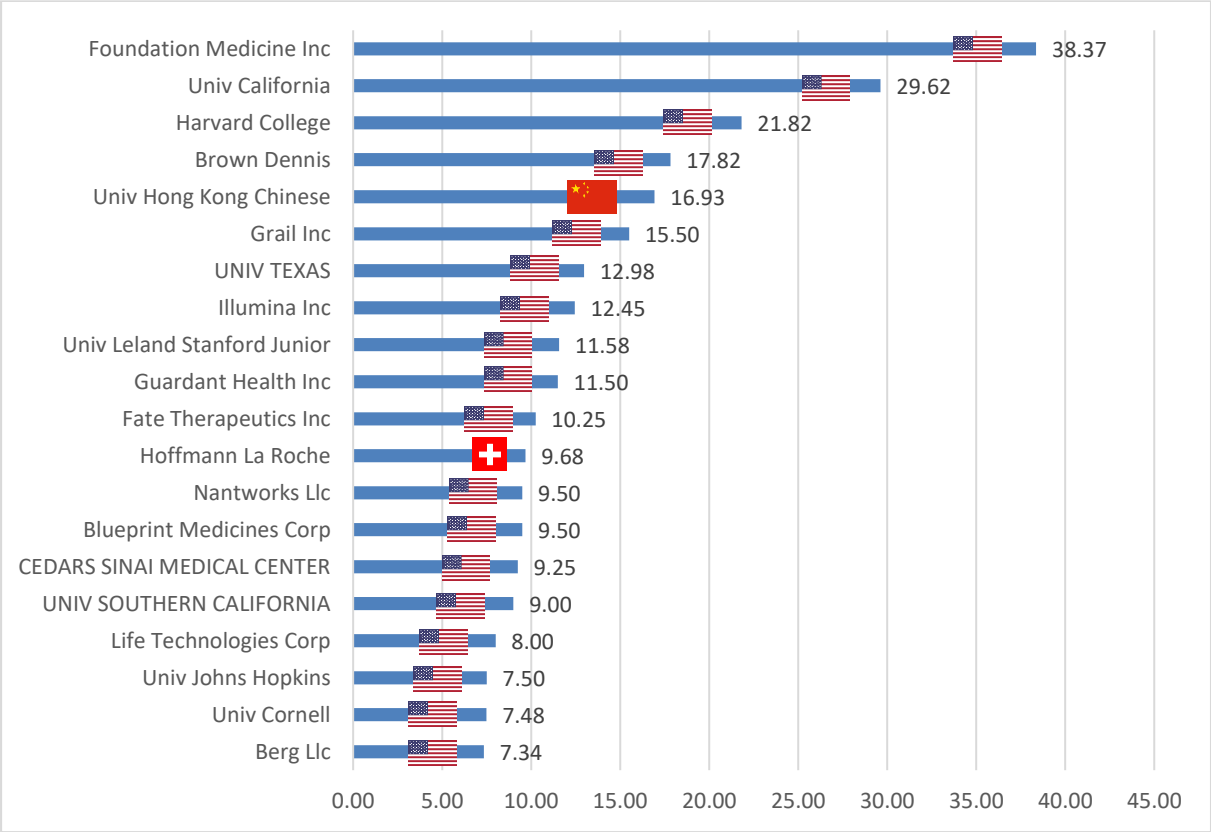
11.2.3 Danish Jurisdiction



11.2.4 US Jurisdiction

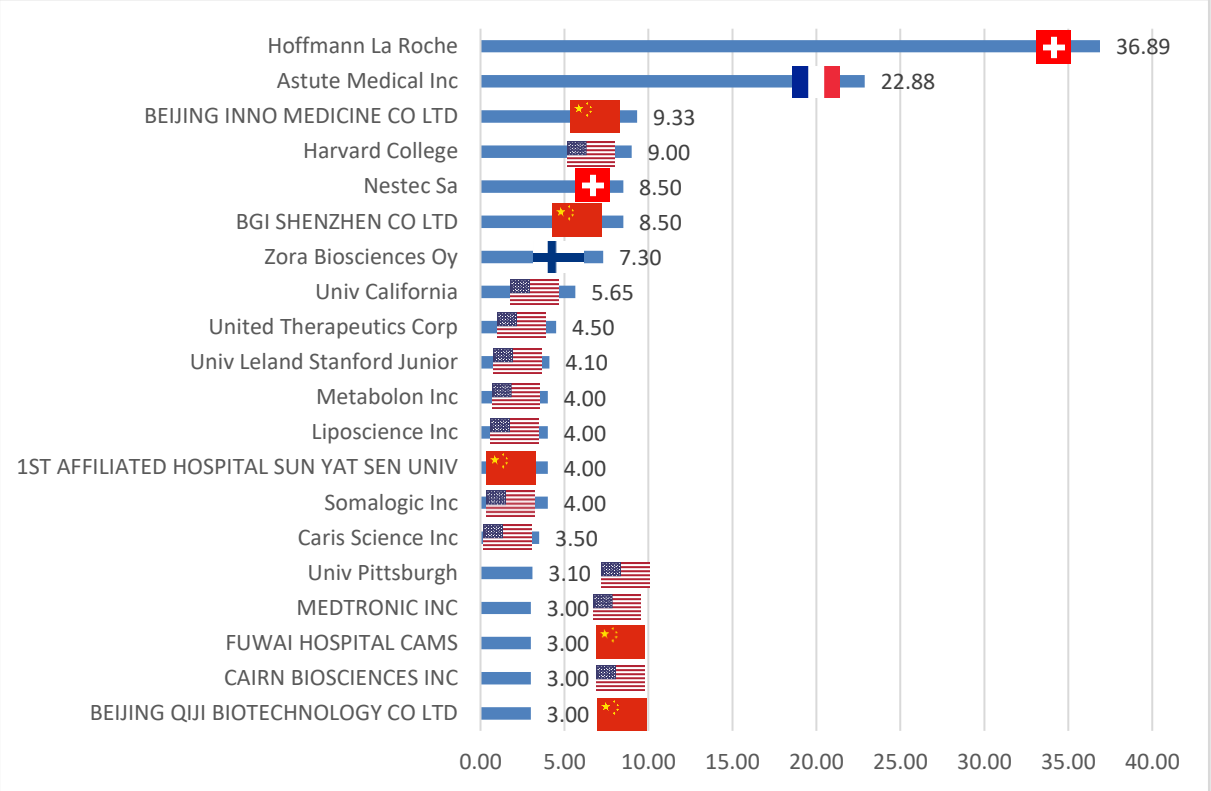


11.2.5 Rest of the World

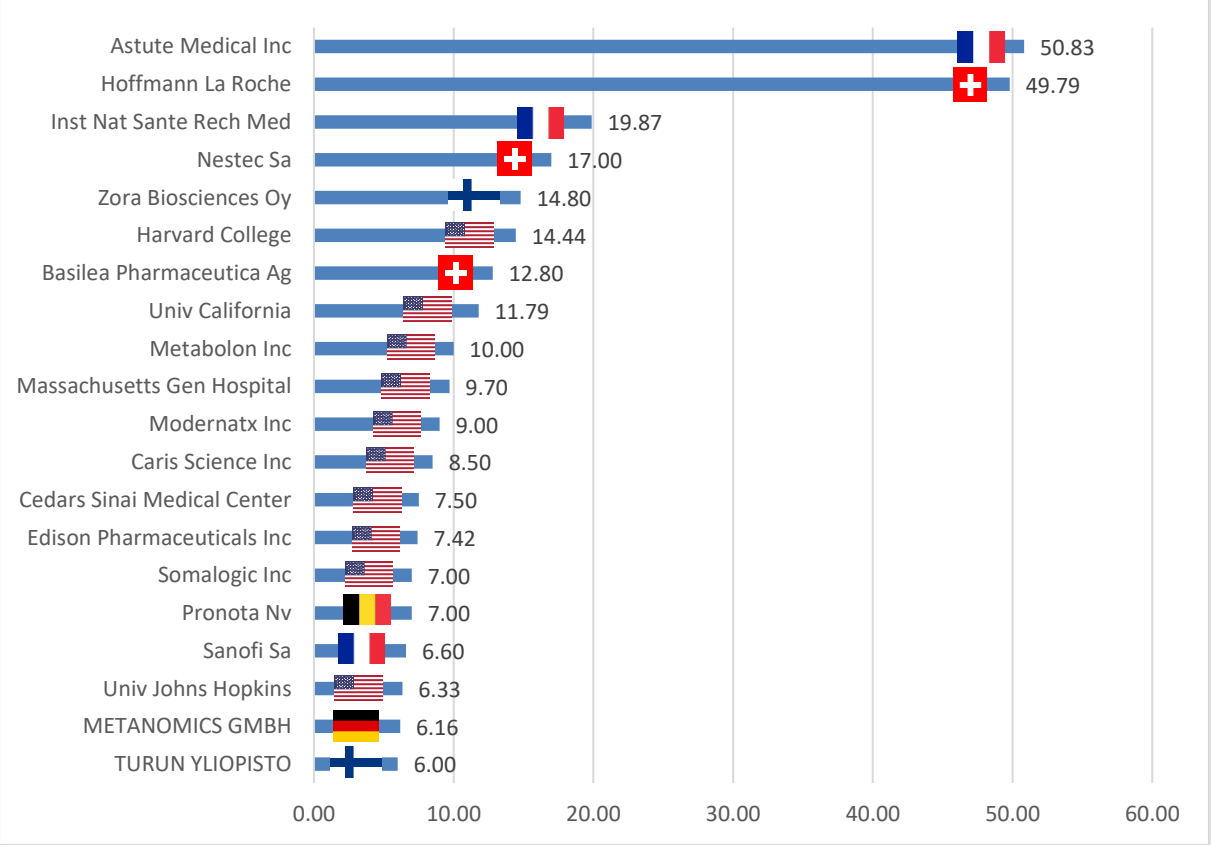


11.3 PERSONALIZED MEDICINE TECHNOLOGY FOR CARDIOVASCULAR DISEASE

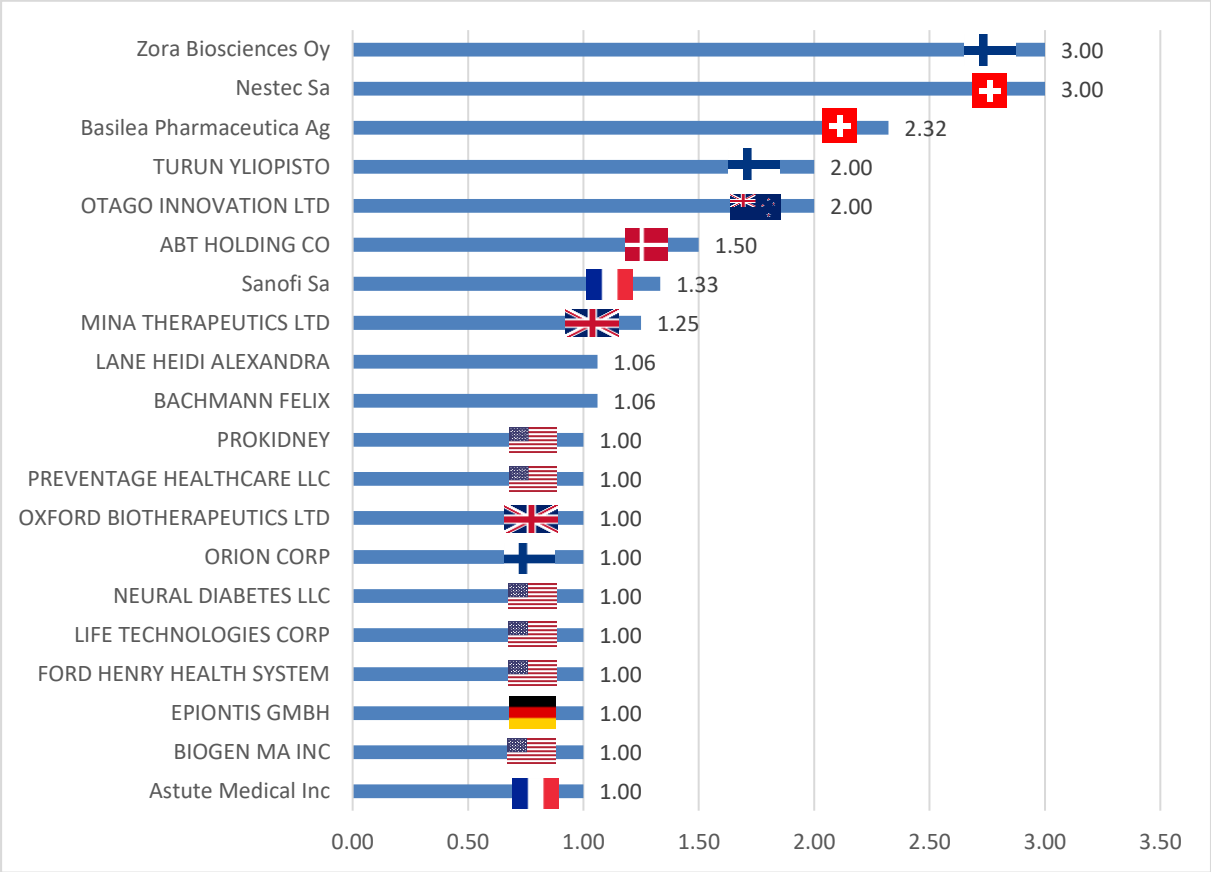
11.3.1 Chinese Jurisdiction



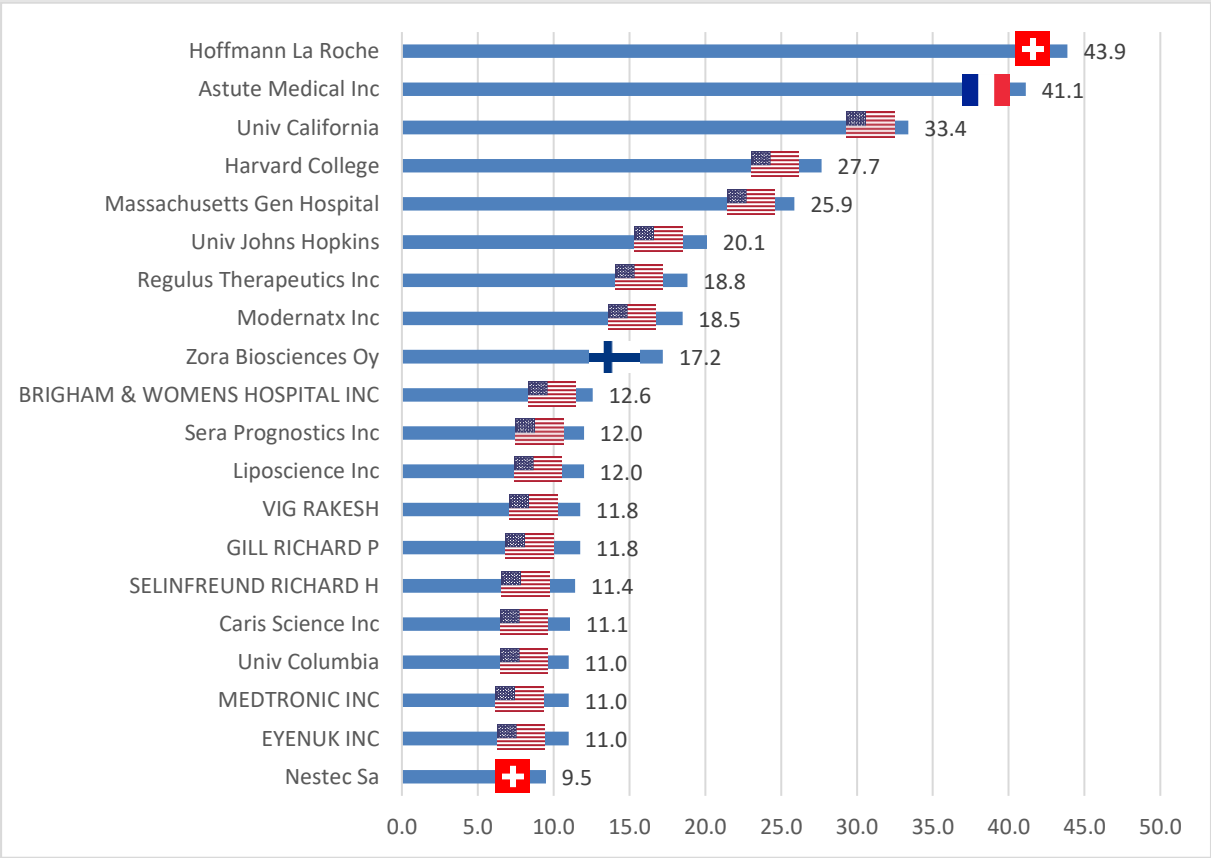
11.3.2 EU Jurisdictions



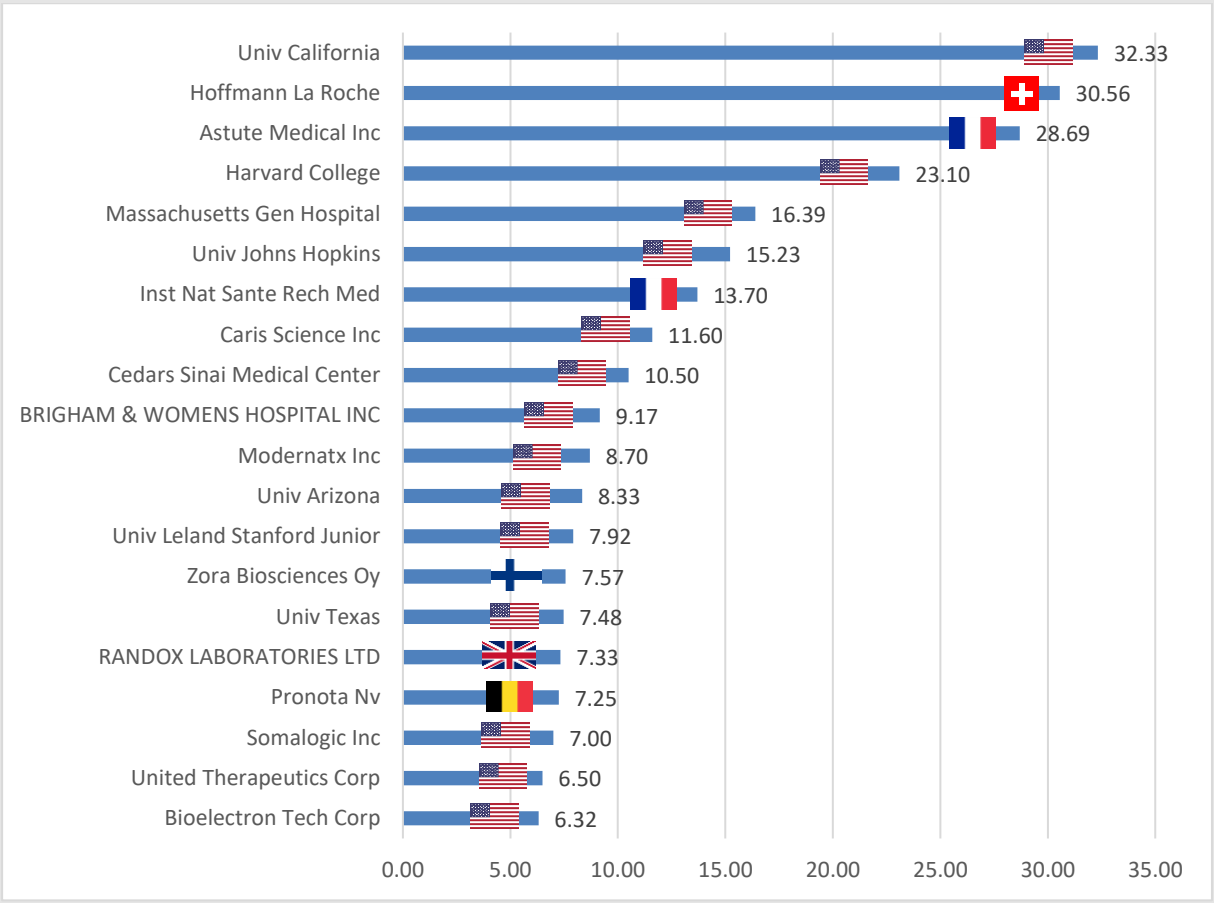
11.3.3 Danish Jurisdiction



11.3.4 US Jurisdiction

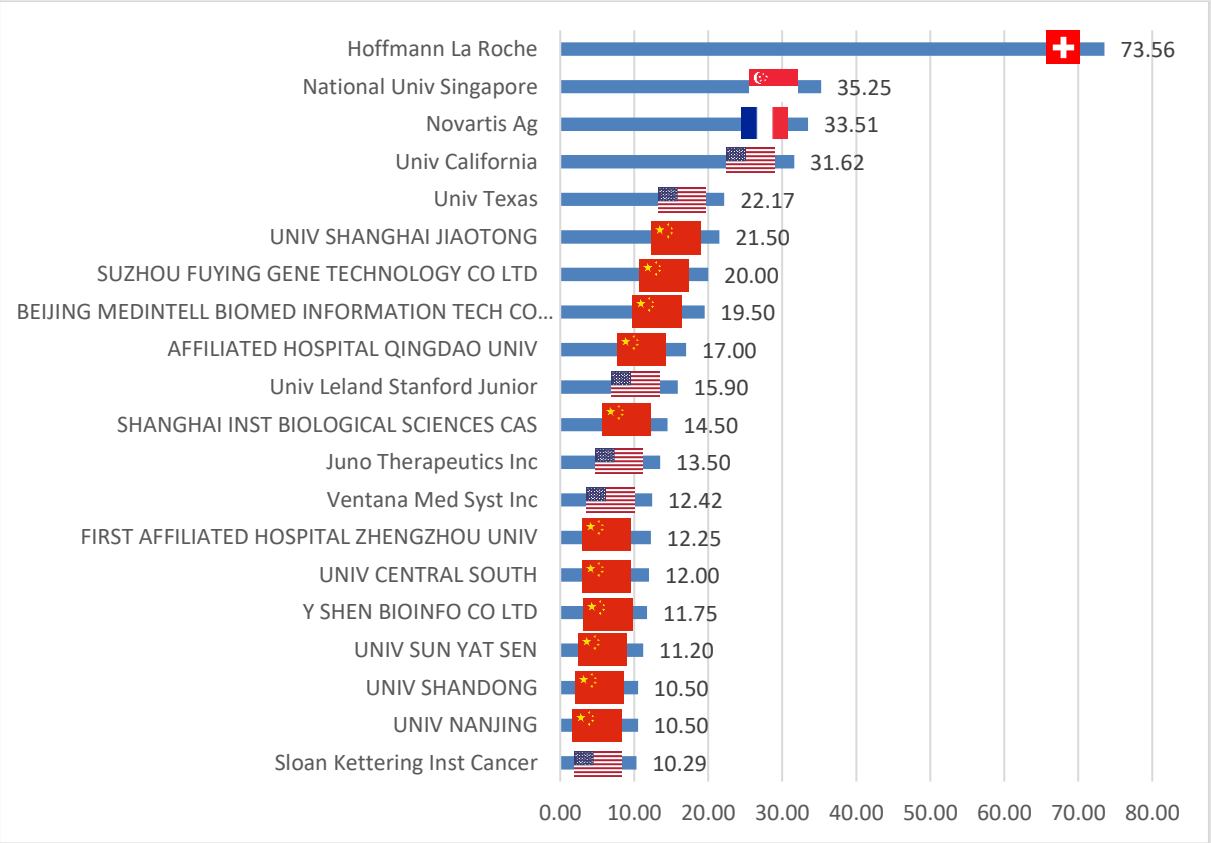


11.3.5 Rest of the World

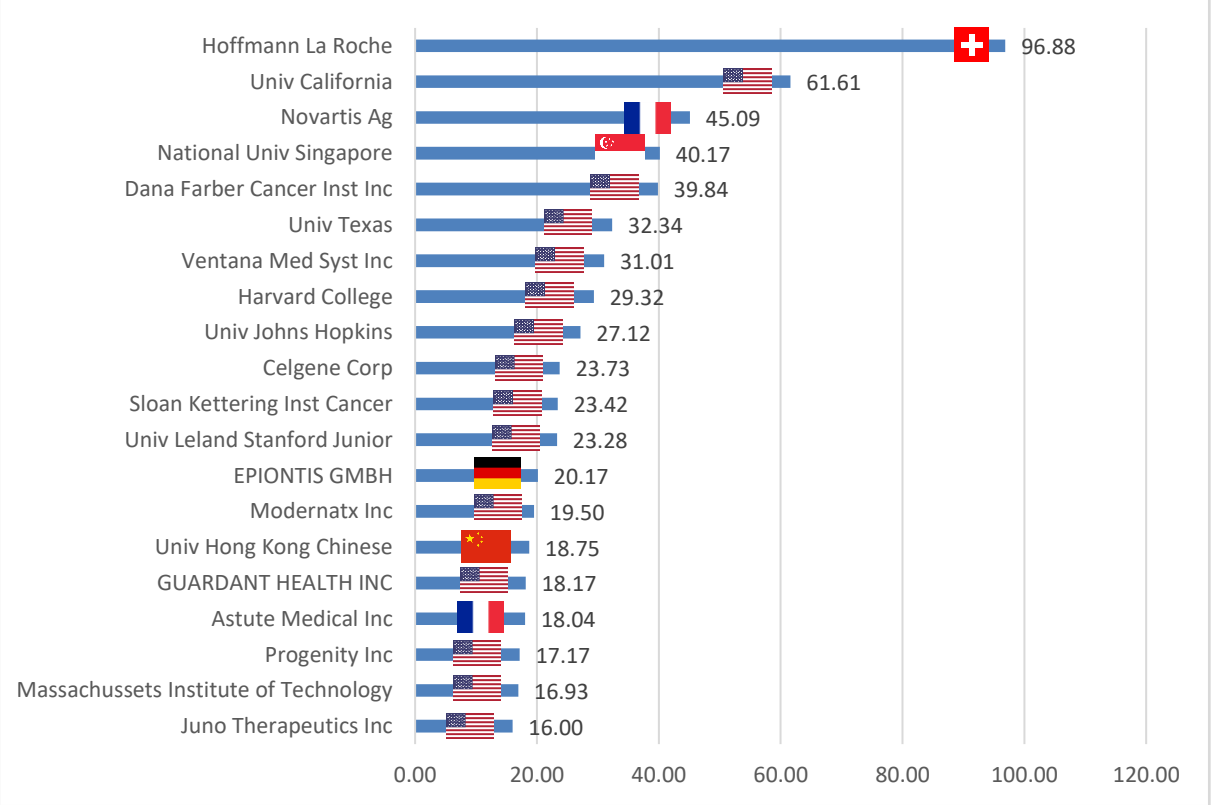


11.4 PERSONALIZED MEDICINE TECHNOLOGY FOR CANCER

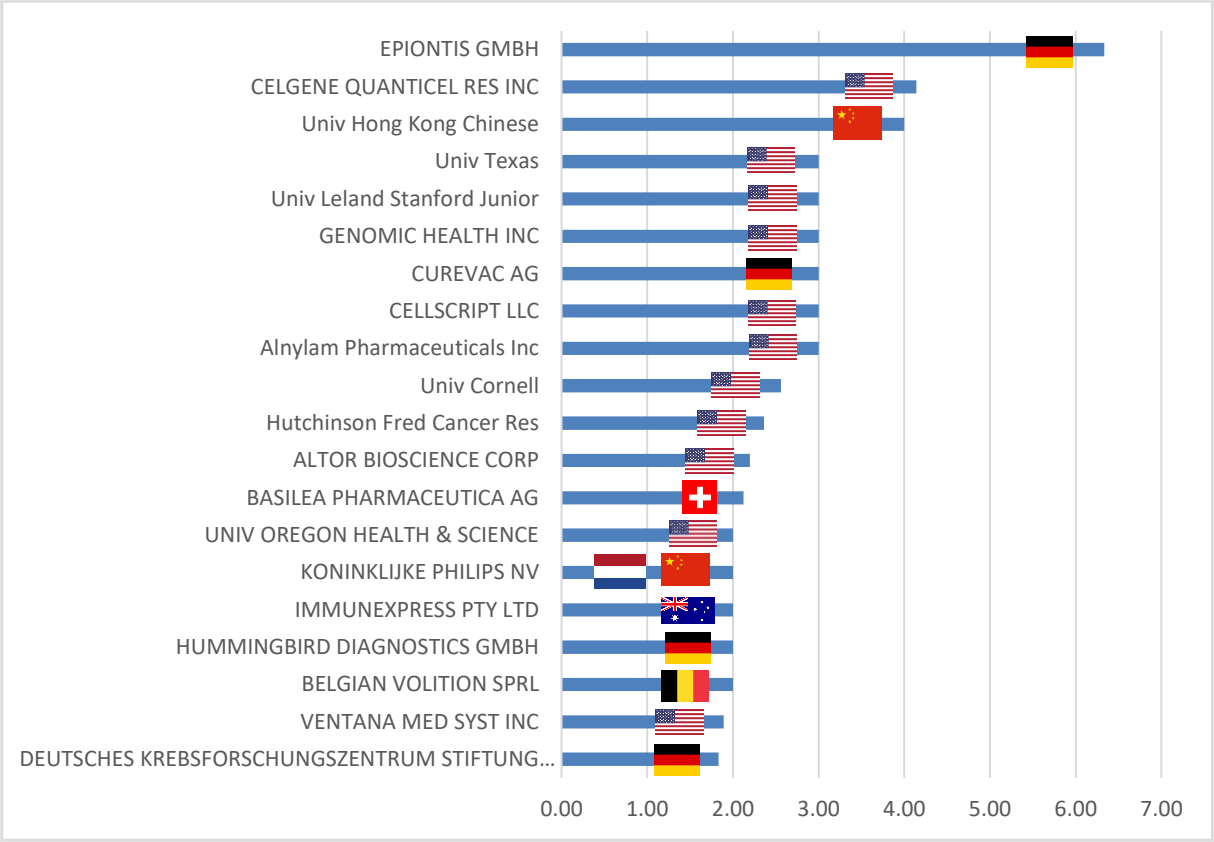
11.4.1 Chinese Jurisdiction



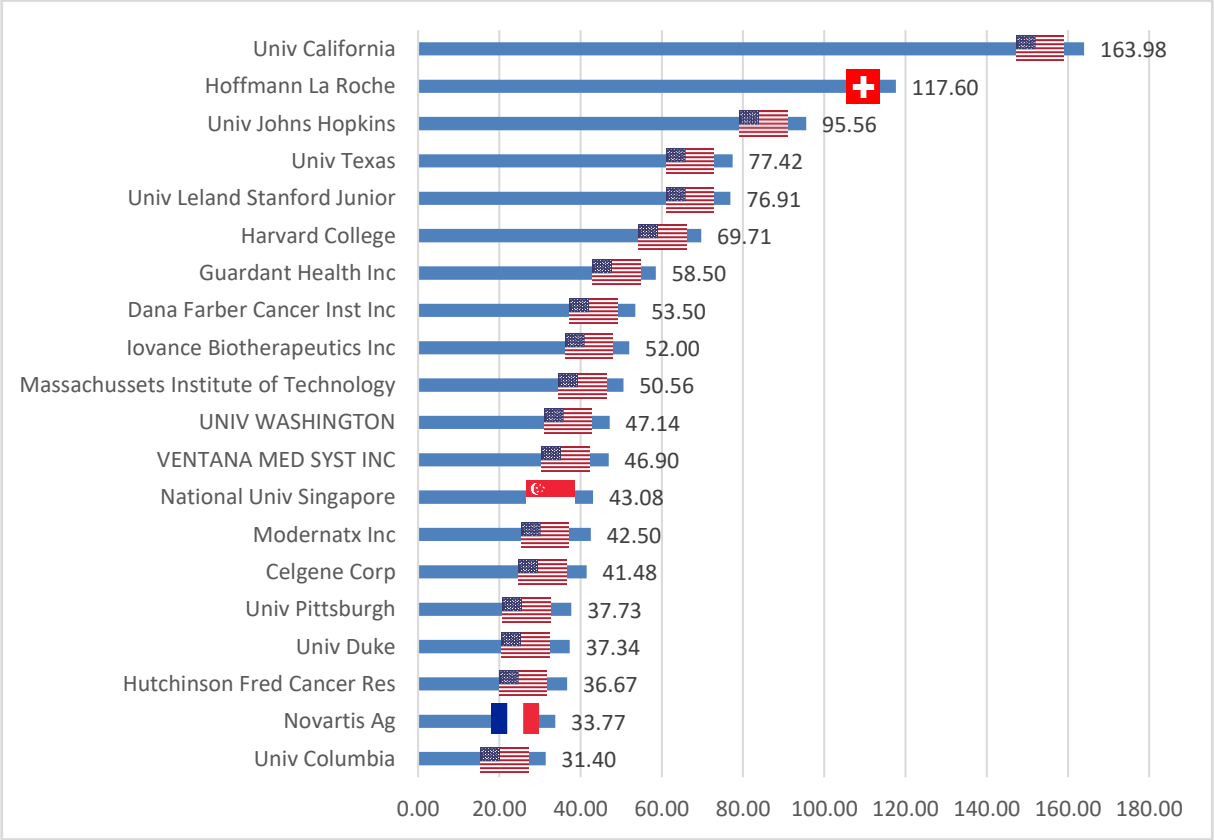
11.4.2 EU Jurisdictions



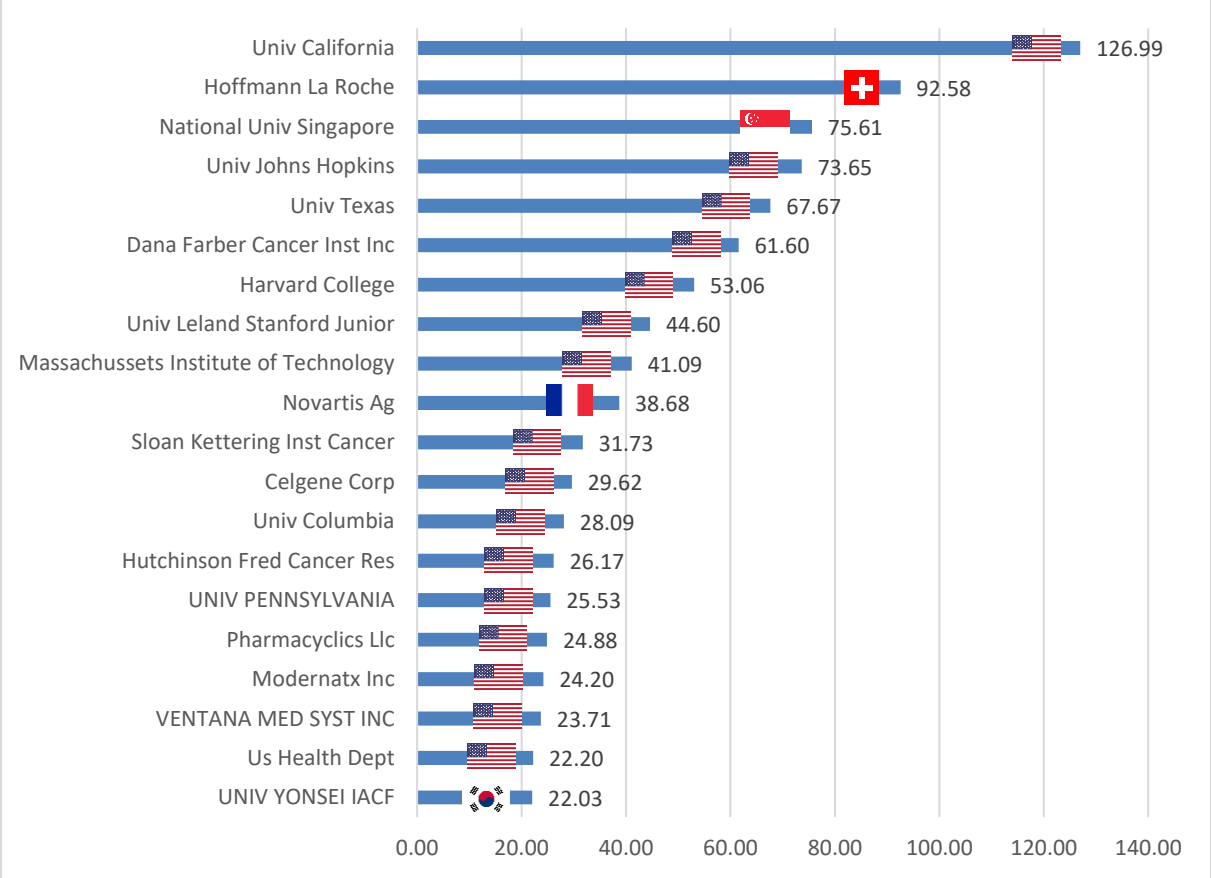
11.4.3 Danish Jurisdiction



11.4.4 US Jurisdiction

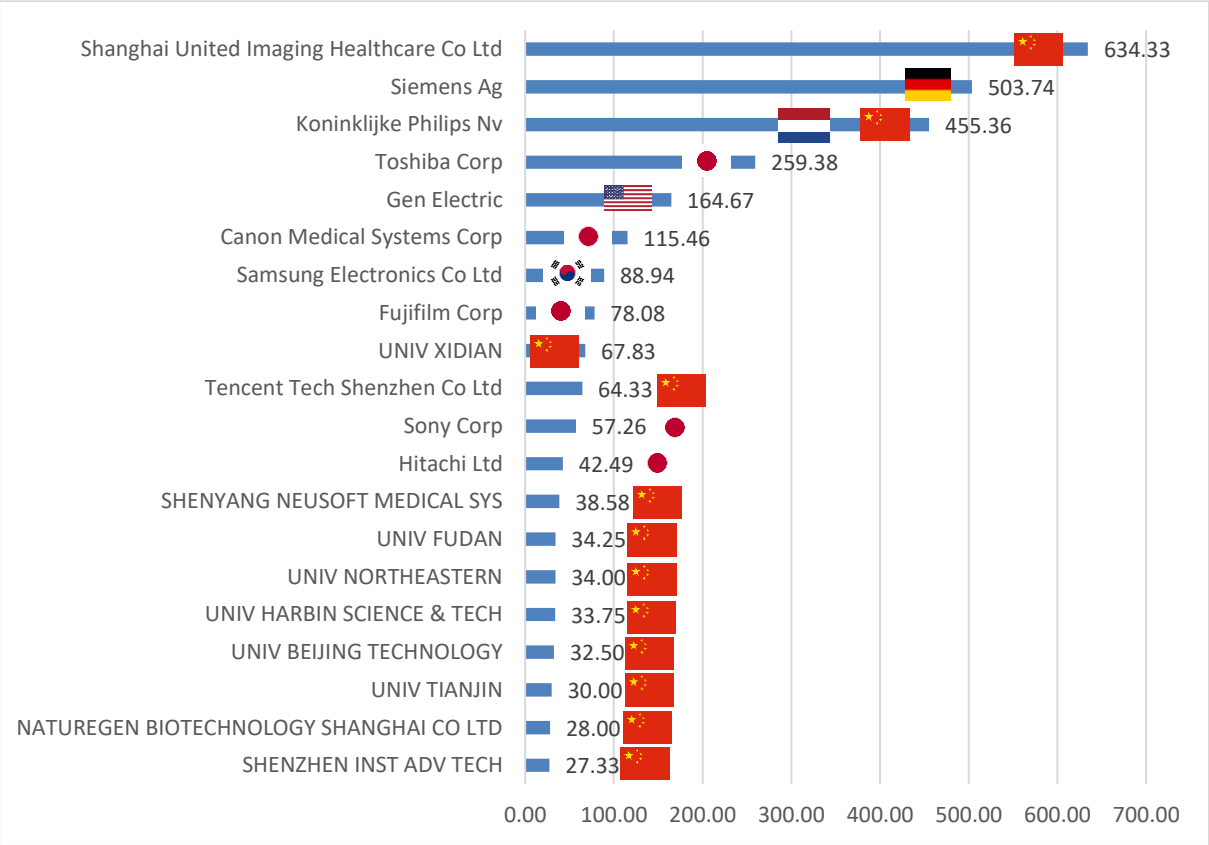


11.4.5 Rest of the World

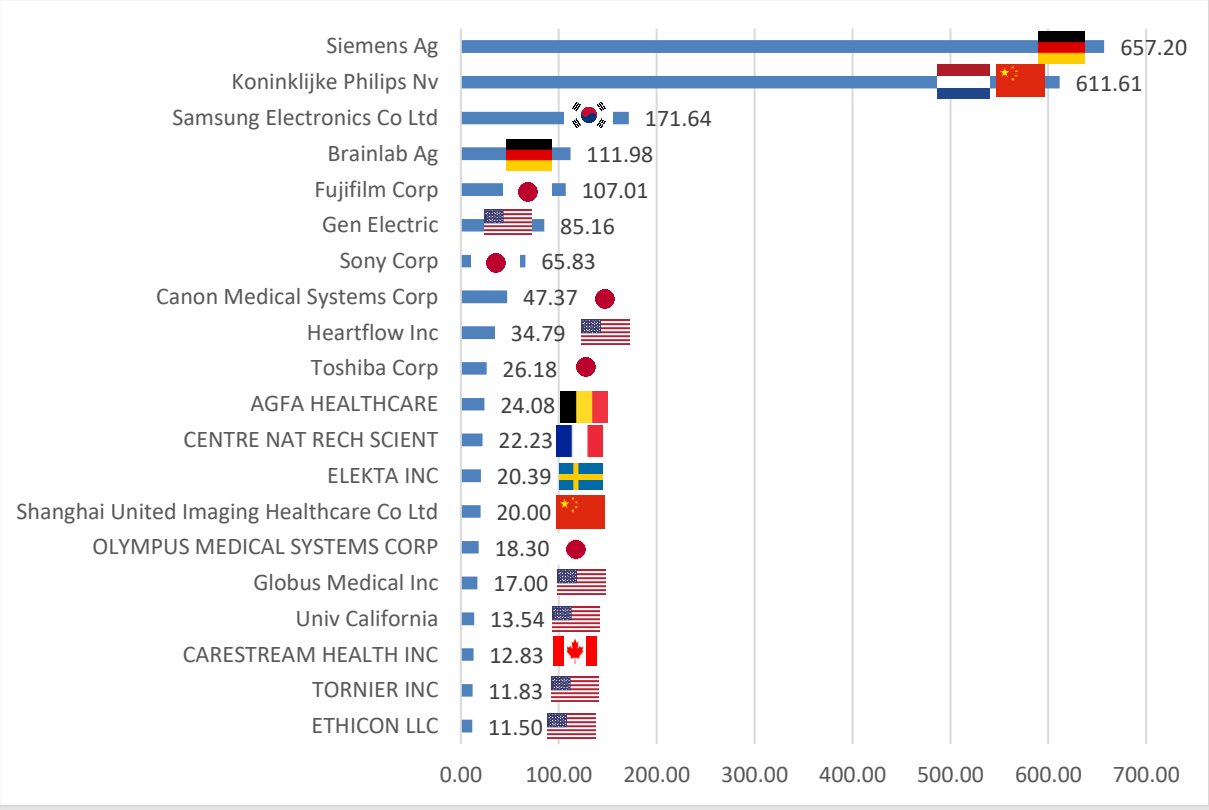


11.5 MEDICAL IMAGING

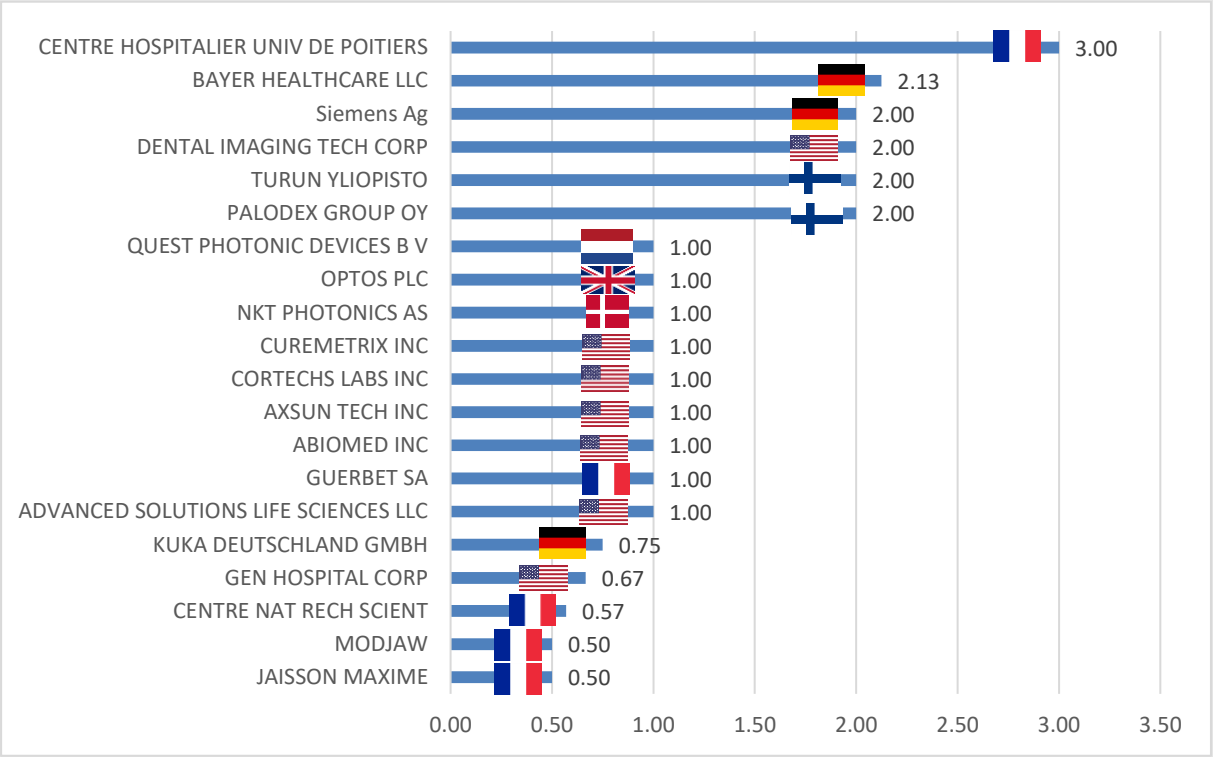
11.5.1 Chinese Jurisdiction



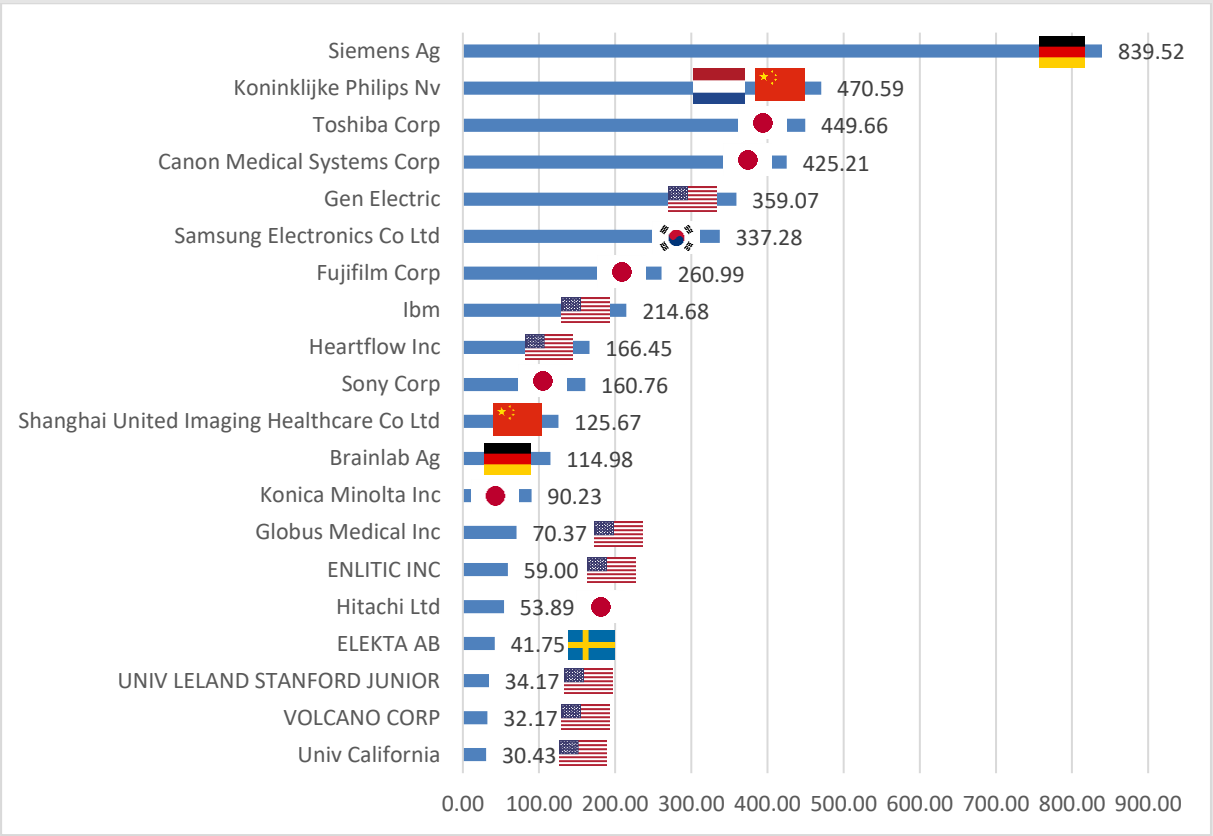
11.5.2 EU Jurisdictions



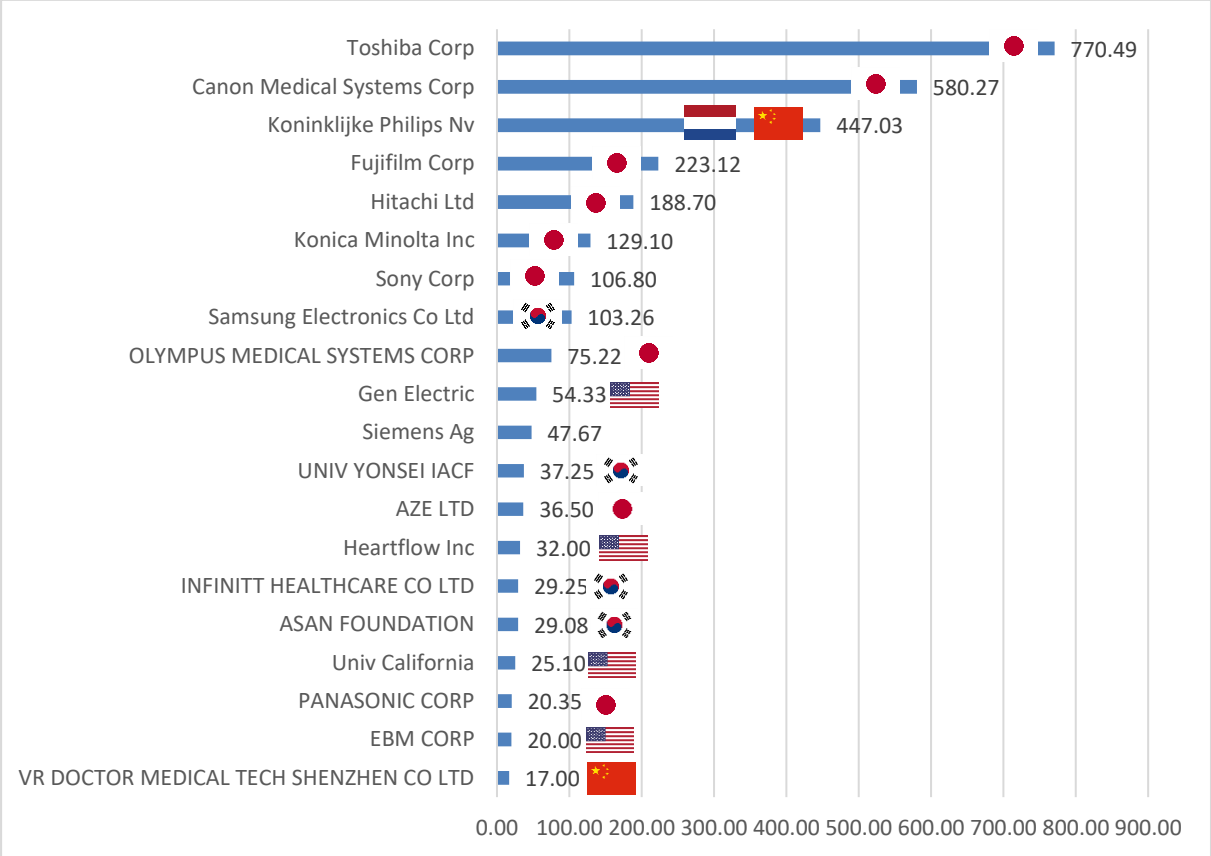
11.5.3 Danish Jurisdiction



11.5.4 US Jurisdiction

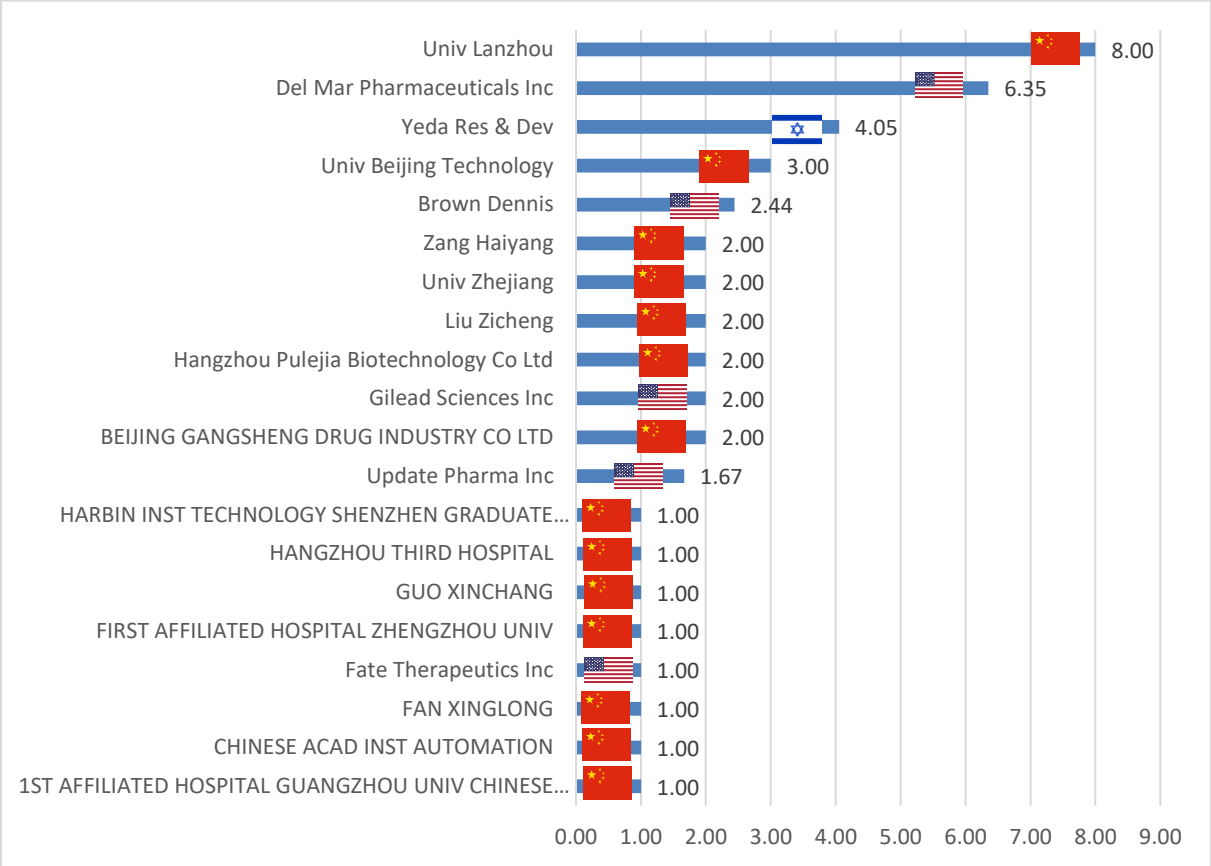


11.5.5 Rest of the World

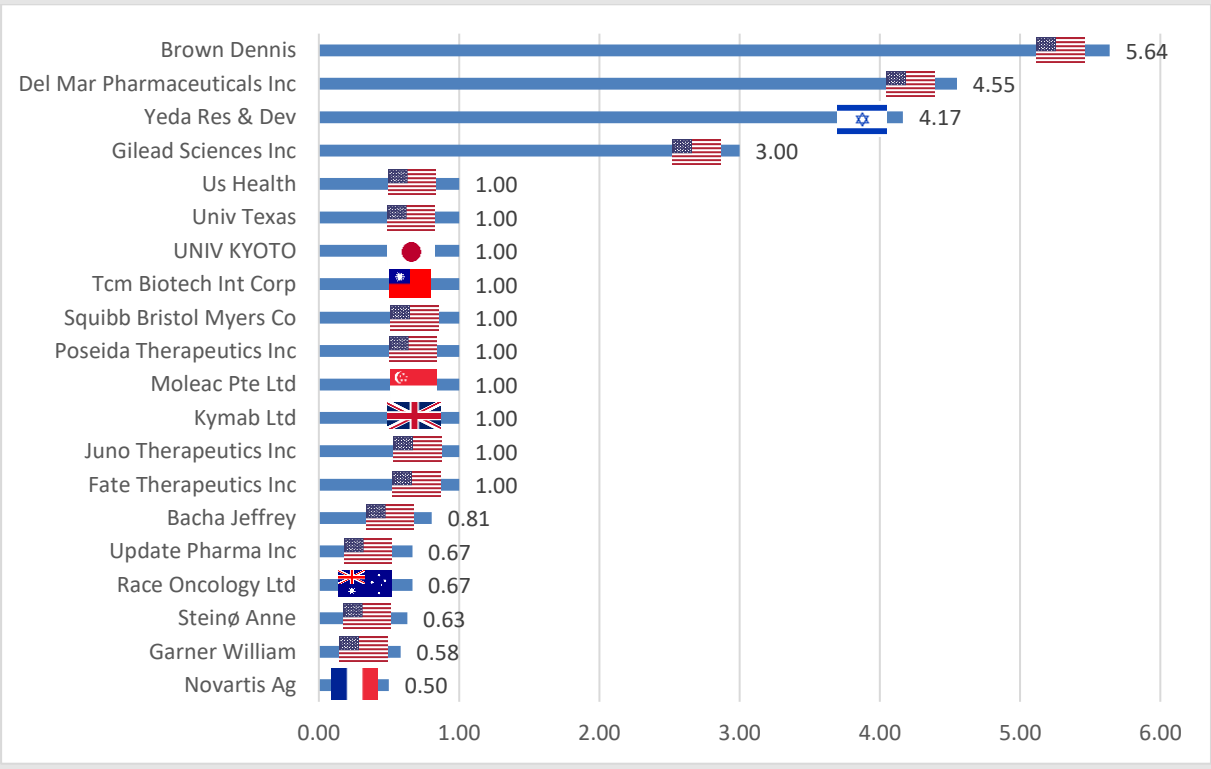


11.6 TRADITIONAL CHINESE MEDICINE

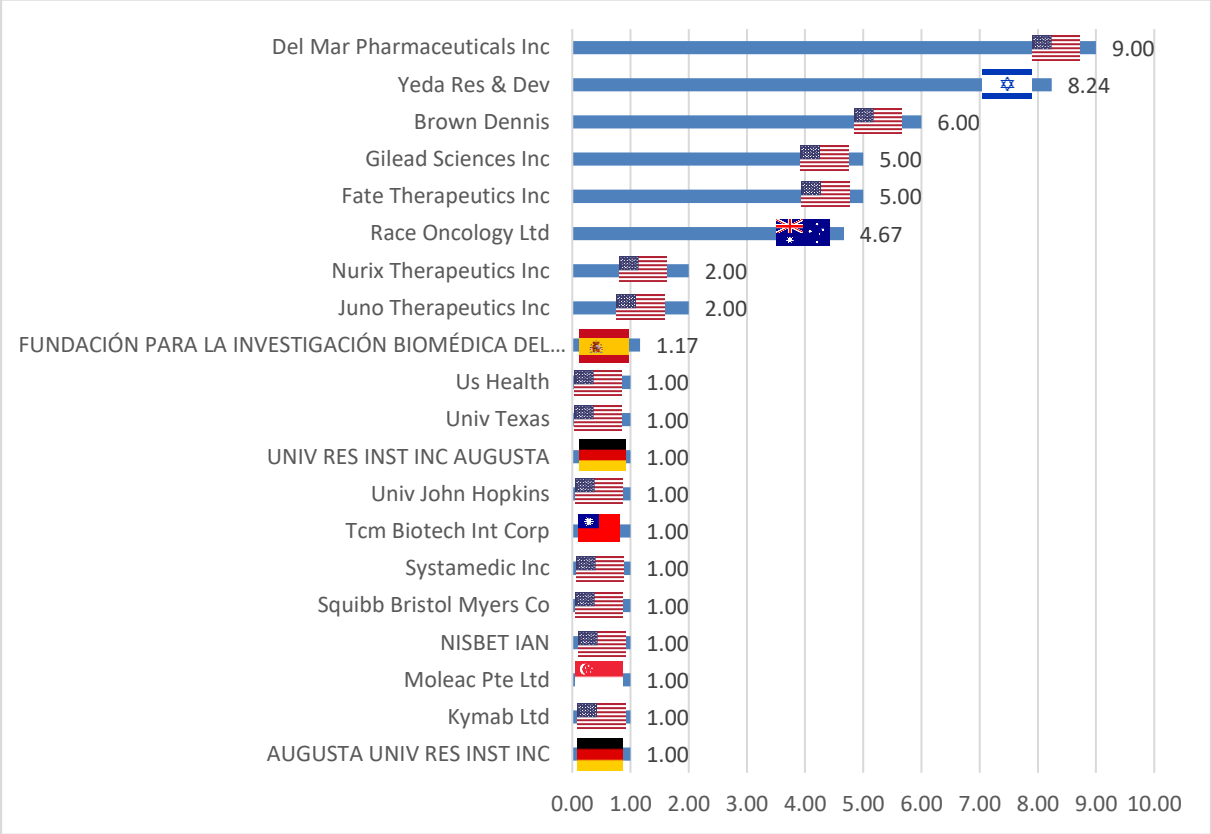
11.6.1 Chinese Jurisdiction



11.6.2 EU Jurisdictions



11.6.3 US Jurisdiction



11.6.4 Rest of the World