Cancer Moonshot Challenge: Technology Trends and Policy Implications

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Cancer Moonshot Challenge

Address the following questions that may have policy implications

Technology Trends:

- ✓ What new insights can be revealed by correlating R&D spending/funding to breakthrough technologies? How would you define or cluster the broad spectrum of cancer treatments, therapies and/or diagnostics?
- ✓ What would trace studies of commercially successful treatments from patent to product tell us? What data insights can be gleaned from understanding the time it takes bring patents to patients?
- ✓ What are the peaks and valleys in the landscape of cancer treatment technologies?

Policy Implications:

- ✓ Based on cluster mapping of cancer treatments, therapies and/or diagnostics, what policy would you put in place to promote certain technologies? For example, would you promote treatment to make cancer a livable disease verses curing?
- ✓ Is there any measurable relationship between patent data, clinical trial data and time to it takes for the technology to be in the hands of the patient. If so, how and what catalyst for innovation and policy changes would you advise the VPOTUS for the Cancer Moonshot.

Key Findings

- **Evidence of immense value of NIH funding:** Analysis of the provided data[1] shows an irrefutable link between patent filings of NIH grant recipients and drug development:
  - 7,051 patent filings from NIH grant recipients
  - Staggering ~100,000 forward citations of the 7,051 patent filings of NIH grant recipients suggesting significant technology impact in anti-cancer drug development efforts
  - Broad based technology Impact indicated by forward citations with thousands of forward citations per year. 43% of patent filings from NIH grant recipients are cited more than 10 times. Forward citing companies includes both Academia and Industry
  - 175 back citations from the patents listed in the FDA orange book link to the patent filings of NIH grant recipients.
  - 25 patents are found in the direct co-occurrence matrix between patent filings of NIH grant recipients and FDA orange book applicants

- **FDA Approval Lag Time**: Analysis shows considerable lag time between patent filings and FDA approvals. There is less than 0.5% probability of a new patent application filing being listed in the FDA orange book. Only about 60-70 patent filings per year are listed in the FDA orange book. Similar low levels of approvals are expected for biologics.

*1 - Patent analysis produced using curated patent data (~270K records) provided specifically for the CMC project by USPTO (including NIH Reporter and FDA Orange Book data), patent citation data from Thomson Innovation, clinical trial data from clinicaltrials.gov and extensive use of the data analysis tool **Vantage Point** from Search Technology.*

Key Findings (contd.)

- **Top FDA applicants and NIH Grant Recipients Trends:** Novartis has the highest number of patents among FDA orange book applicants while Stanford, Scripps, and UCSD are the top three patent filing NIH grant recipients with average of 230 patent filings

- **Top Technology Trends (Peaks and Valleys):**
  - **Peaks:** In addition to chemical drugs, there is strong interest in biotech (nucleoside and protein sequences, antibodies), diagnostics, and devices
  - **Valleys:** Food and Nutrition appears to be a big opportunity area, especially with a goal of prevention and making cancer a livable disease

- **Clinical Trials Analysis:**
  - 21% of the anti-cancer clinical trials identify NIH or U.S Federal Agency grants as the source of funding
  - 96% of the clinical trials are directed to all age groups (child, adult and senior)
  - Overwhelming portion of clinical trials are interventional

** Patent analysis produced using curated patent data (~270K records) provided specifically for the CMC project by USPTO (including NIH Reporter and FDA Orange Book data), patent citation data from Thomson Innovation, clinical trial data from clinicaltrials.gov and extensive use of the data analysis tool* ***Vantage Point*** *from Search Technology.*

Technology Trends

Patent landscape and the accompanying IP competitive intelligence involves understanding and anticipating the competitive environment within which an entity (company or government) operates[2]. Analysis of the provided data (~270K records) coupled with additional citation data[3] and clinical trial data[4] suggests that cancer research is active within both, academia and industry. Furthermore, an analysis of the ~100K forward citations of the 7,051 patent filings of NIH grant recipients shows broad-based significant technology impact. Technology areas of high interest (peaks) include chemical drugs, biotech, diagnostics, devices, and special dosage physical forms.

A key opportunity area (valley) includes food and nutrition. To quote Benjamin Franklin: "*An ounce of prevention is worth a pound of cure*." Thus, it would be beneficial to allocate a portion of anti-cancer NIH grants to focus on cancer prevention and making cancer a livable disease. For example, this portion of anti-cancer NIH grants may include funding epidemiological studies to better understand cancer risk factors and to ascertain the links between diet, sugar consumption, fat consumption, grain consumption, exercise, lifestyle, nutritional supplements, etc. with cancer risk.

Another opportunity area includes exploring procedures for reducing the lag time of 5+ year on average between patent filings and FDA approval. It would be beneficial to focus on expediting FDA approval of promising "safe and effective" cancer drugs, especially those cancer drugs that have been approved in other countries. Analysis supports implementation of the following policies advocated by Sen. Lamar Alexander (R-Tenn.) and Sen. Richard Burr (R-N.C.) in their recent senate report[5] "Innovation for Healthier Americans":

- *"Effective public policies to facilitate the translation of basic research into the successful development of innovative products, including enhanced collaboration between public sector, academic, and industry efforts;*
- *Modernized clinical trials and a more efficient and effective regulatory framework for medical product"*

Policy Implications

1. Allocate a larger portion of NIH grants to fund anti-cancer basic research (as applicable) knowing that the resulting publications will continue to advance drug development efforts. NIH grant recipients may be encouraged to find additional industry collaborations.
2. Allocate a portion of NIH grants for prevention and making cancer a livable disease, including sponsoring more epidemiological studies to understand cancer risk factors and to ascertain the links between diet, sugar consumption, fat consumption, grain consumption, exercise, lifestyle, nutritional supplements, etc. with cancer risk. Investigative non-patent
3. Expedite FDA approval of promising cancer drugs, especially those cancer drugs that have been approved elsewhere. This suggestion is in line with the recent Senate report “Innovation for Healthier Americans” from Senators Alexander and Burr.

Riser IP™

Supporting
Data Analysis and Visualization

Citation Analysis: Forward Citations
~100K Forward Citations

- Forward Citation Analysis of the 7,054 patents from NIH Grant Recipients shows a staggering **~100K forward citations**
- Analysis of forward citations provides a better indicator of the technology impact of NIH grants

7,054 patent filings (in 4,641 NIH Grants)

Forward Citations

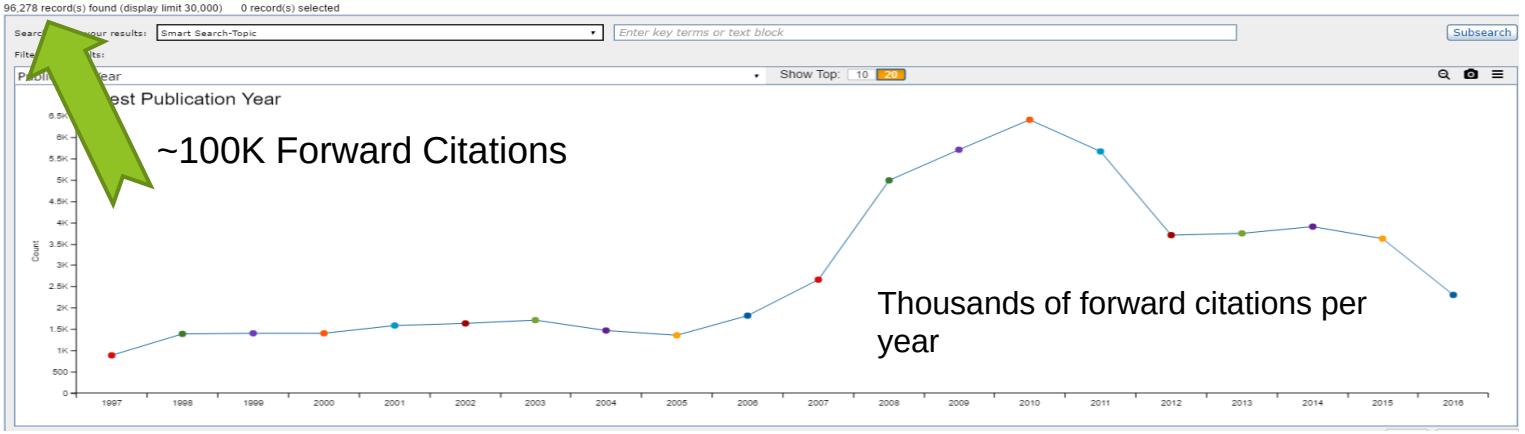
~100,000

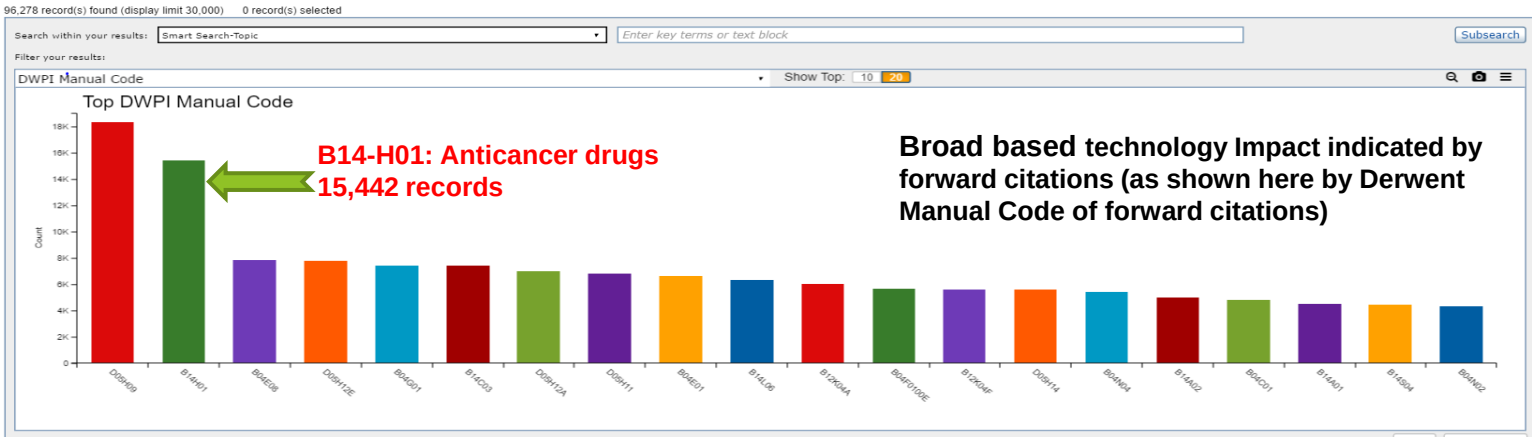
~100K forward citations contributing to every aspect of cancer research and significant technology impact (see next two slides)

Citation analysis created using Thomson Innovation patent data.

Citation Analysis:
Forward Citations indicate significant technology impact

- Thousands of forward citations per year from 7,051 patent filings of NIH grant recipients
- Broad based technology impact with more than 15,000 forward citations being coded specifically as anticancer drug

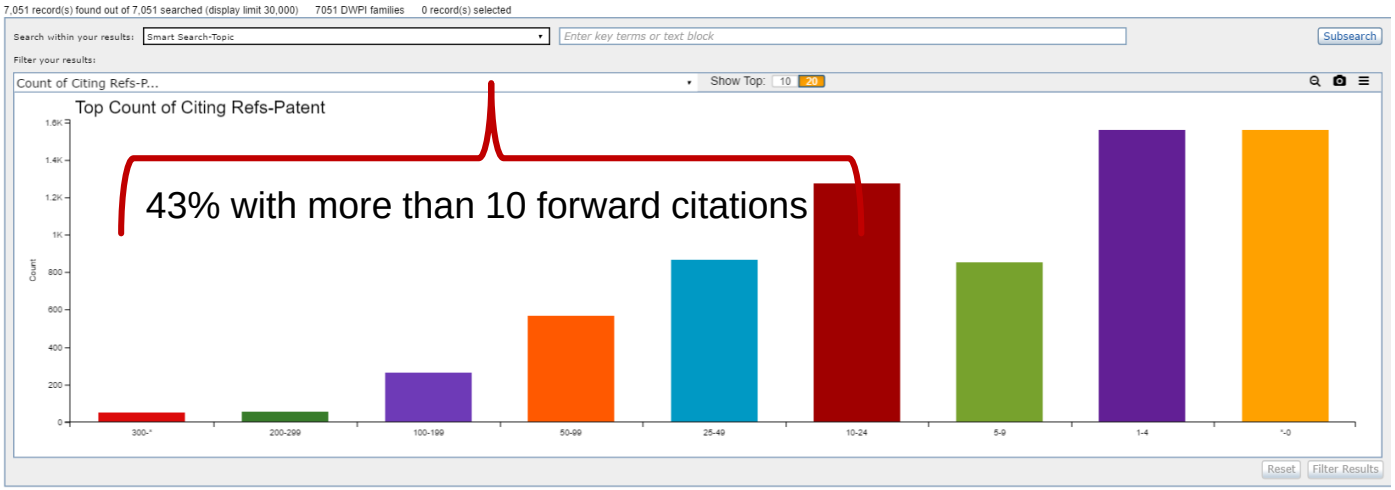


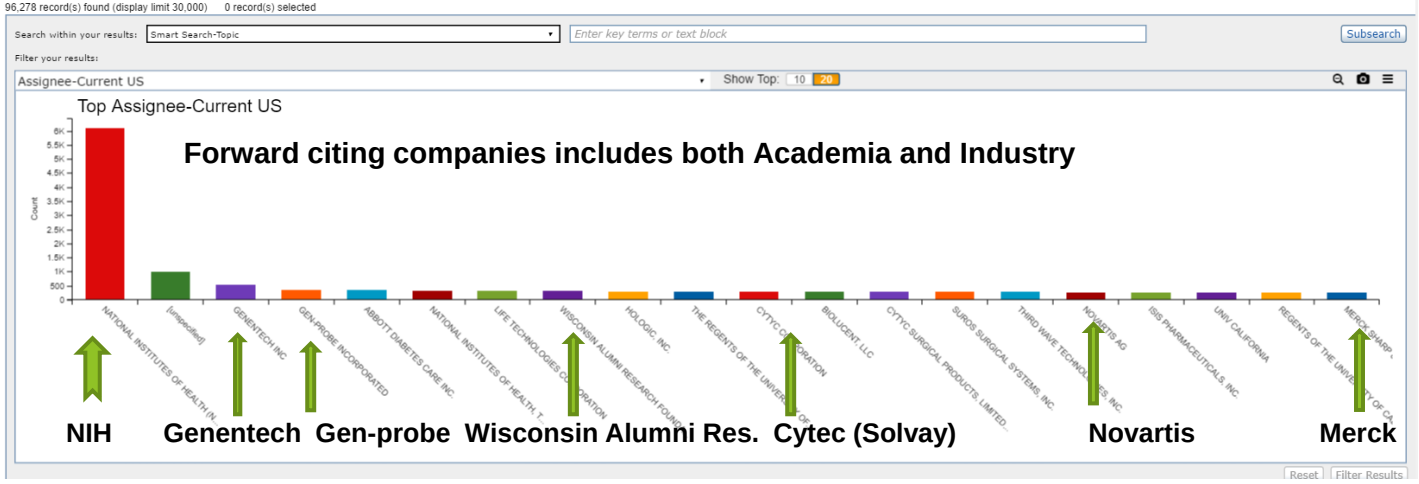


Citation analysis created using Thomson Innovation patent data.

Citation Analysis:
Forward Citations indicate significant technology impact

- 43% of patent filings from NIH grant recipients are cited more than 10 times
- Forward citations from both academia and industry





Citation analysis created using Thomson Innovation patent data.

Citation Analysis:
Top Forward Citing Patents

- Selected top forward citing patent filings of NIH grant recipients

Publication Number	Title	Assignee/Applicant	Count of Citing Patents	Gov't Interest (US)
US5837832A	Arrays of nucleic acid probes on biological chips	Affymetrix Inc.,Santa Clara,CA,US	978	Research leading to the invention was funded in part by NIH grant No. 1R01HG00813-01 and DOE grant No. DE-FG03-92-ER81275, and the government may have certain rights to the invention.
US6207646B1	Immunostimulatory nucleic acid molecules	University of Iowa Research Foundation,Iowa City,IA | Coley Pharmaceutical Group Inc.,Wellesley,MA | The United States of America as represented by the Department of Health and Human Services,Washington,DC	907	GOVERNMENT SUPPORTThe work resulting in this invention was supported in part by National Institute of Health Grant No. R29-AR42556-01. The U.S. Government may therefore be entitled to certain rights in the invention.
US6239116B1	Immunostimulatory nucleic acid molecules	University of Iowa Research Foundation,Iowa City,IA | Coley Pharmaceutical Group Inc.,Wellesley,MA | The United States of America as represented by the Department of Health and Human Services,Washington,DC	749	The work resulting in this invention was supported in part by National Institute of Health Grant No. R29-AR42556-01. The U.S. Government may be entitled to certain rights in the invention.
US5464764A	Positive-negative selection methods and vectors	University of Utah Research Foundation,Salt Lake City,UT,US	644	This invention was funded under grant No. R01-GM-21168 issued by the U. S. Department of Health and Human Services.

Citation analysis created using Thomson Innovation patent data.

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Top Forward Citing Patents

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US6207646B1	Immunostimulatory nucleic acid molecules	University of Iowa Research Foundation,Iowa City,IA | Coley Pharmaceutical Group Inc.,Wellesley,MA | The United States of America as represented by the Department of Health and Human Services,Washington,DC	907 *See next slide for more details	GOVERNMENT SUPPORTThe work resulting in this invention was supported in part by National Institute of Health Grant No. R29-AR42556-01. The U.S. Government may therefore be entitled to certain rights in the invention.
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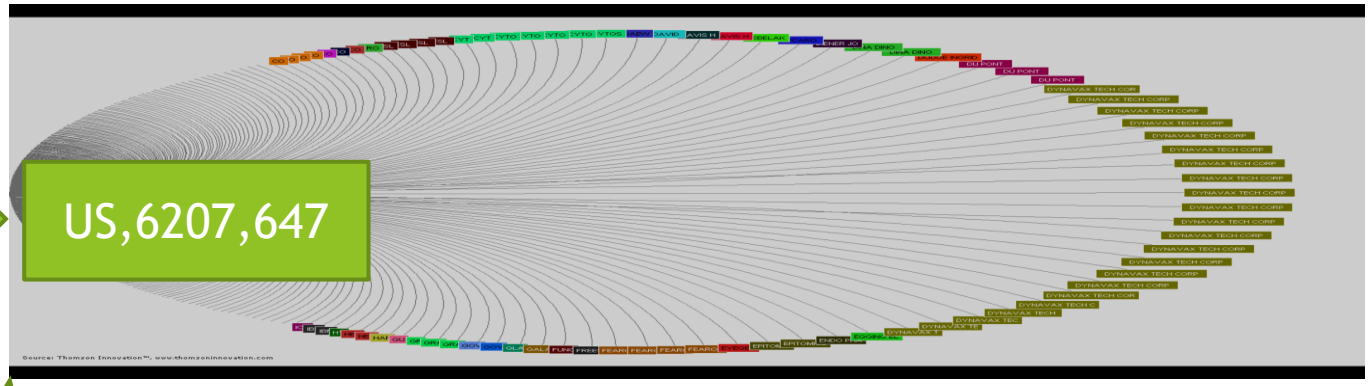
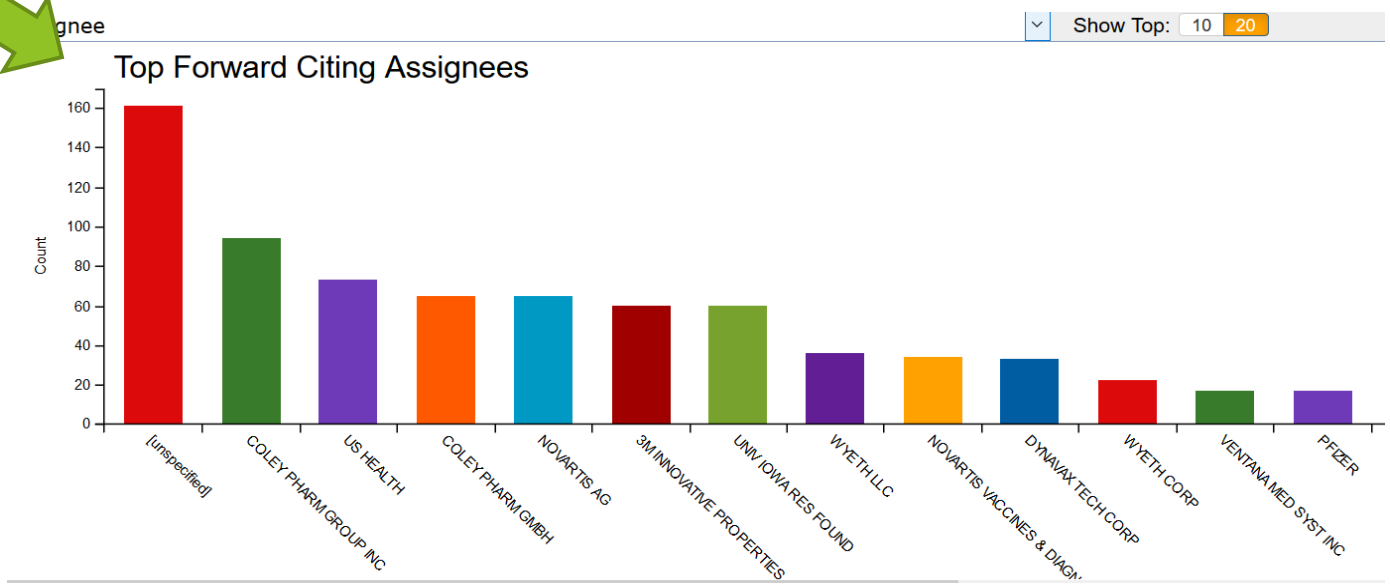
Citation analysis created using Thomson Innovation patent data.

Citation Analysis:
907 Forward Citing Patents - US6207646B1

- Selected forward citing patent assignees include Novartis, Pfizer and others suggesting value of patent filings of NIH Grant recipients

907 Forward Citing Patents - US6207646B1



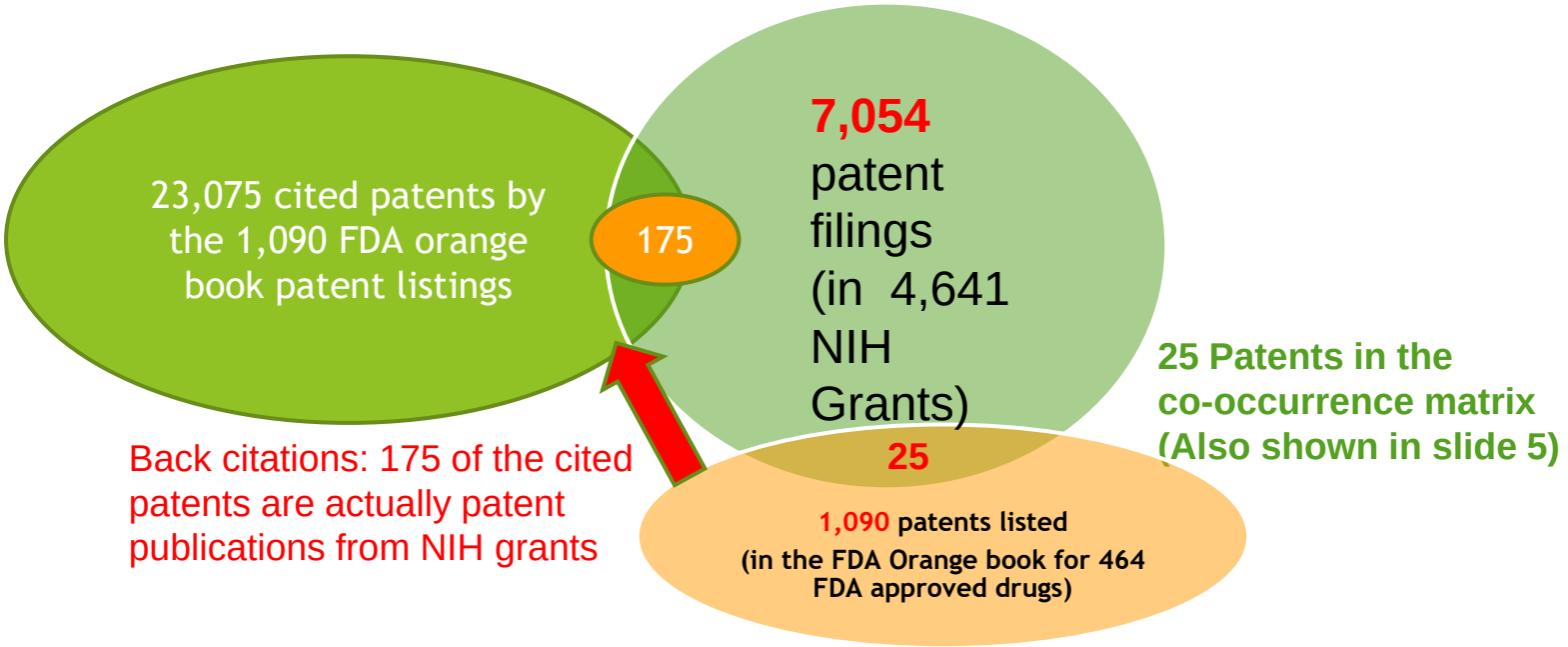


Citation analysis created using Thomson Innovation patent data.

Citation Analysis: Back Citations
175 NIH Grant Recipients' patents cited by FDA Orange Book Applicants

- 175 NIH Grant Recipients' patents cited by FDA Orange Book Applicants

Backward Citation Analysis of the 1090 patents in the FDA orange book cite 23,075 patents of which 175 are actually patent filings from the 7,054 patent filings by NIH Grant Recipients.

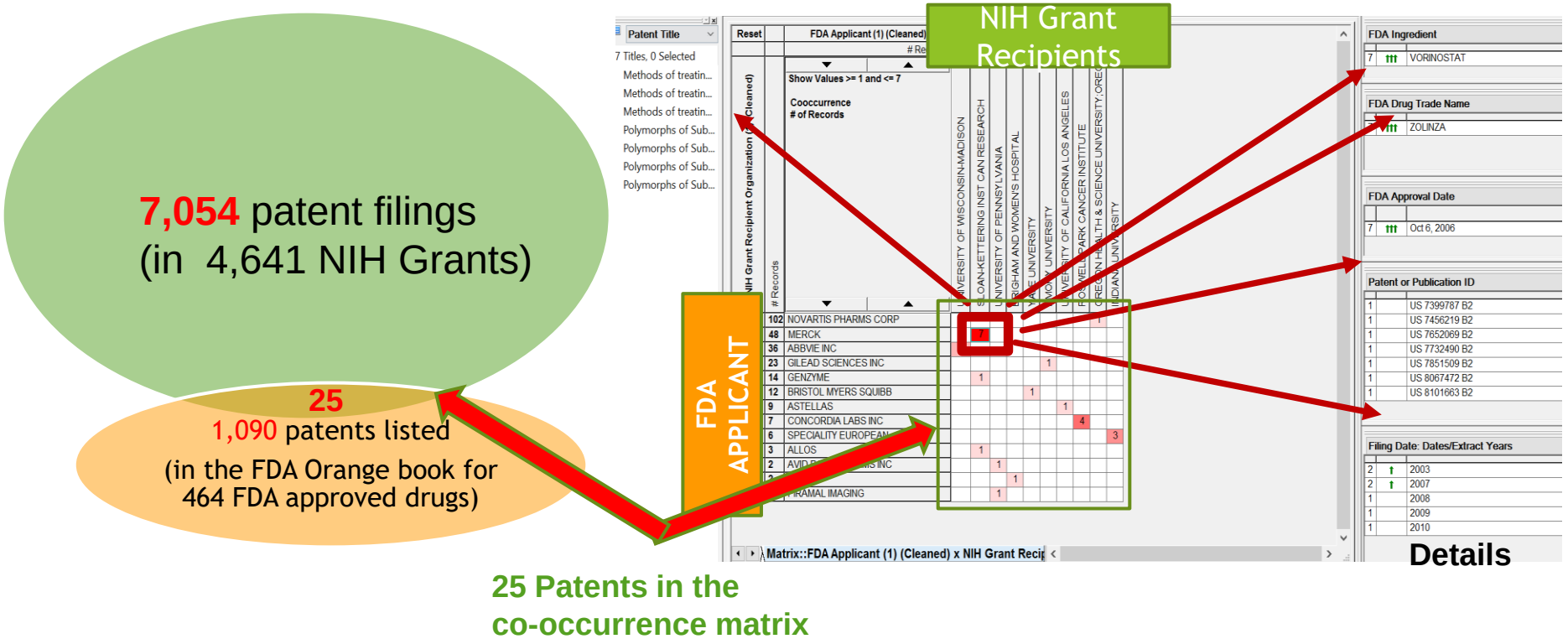


Citation analysis created using Thomson Innovation patent data.

Co-occurrence

- 25 patent records show co-occurrence among the reported 7054 patent filings (in 4,641 NIH Grants) and 1,090 granted patents listed in 464 FDA Orange book listings.

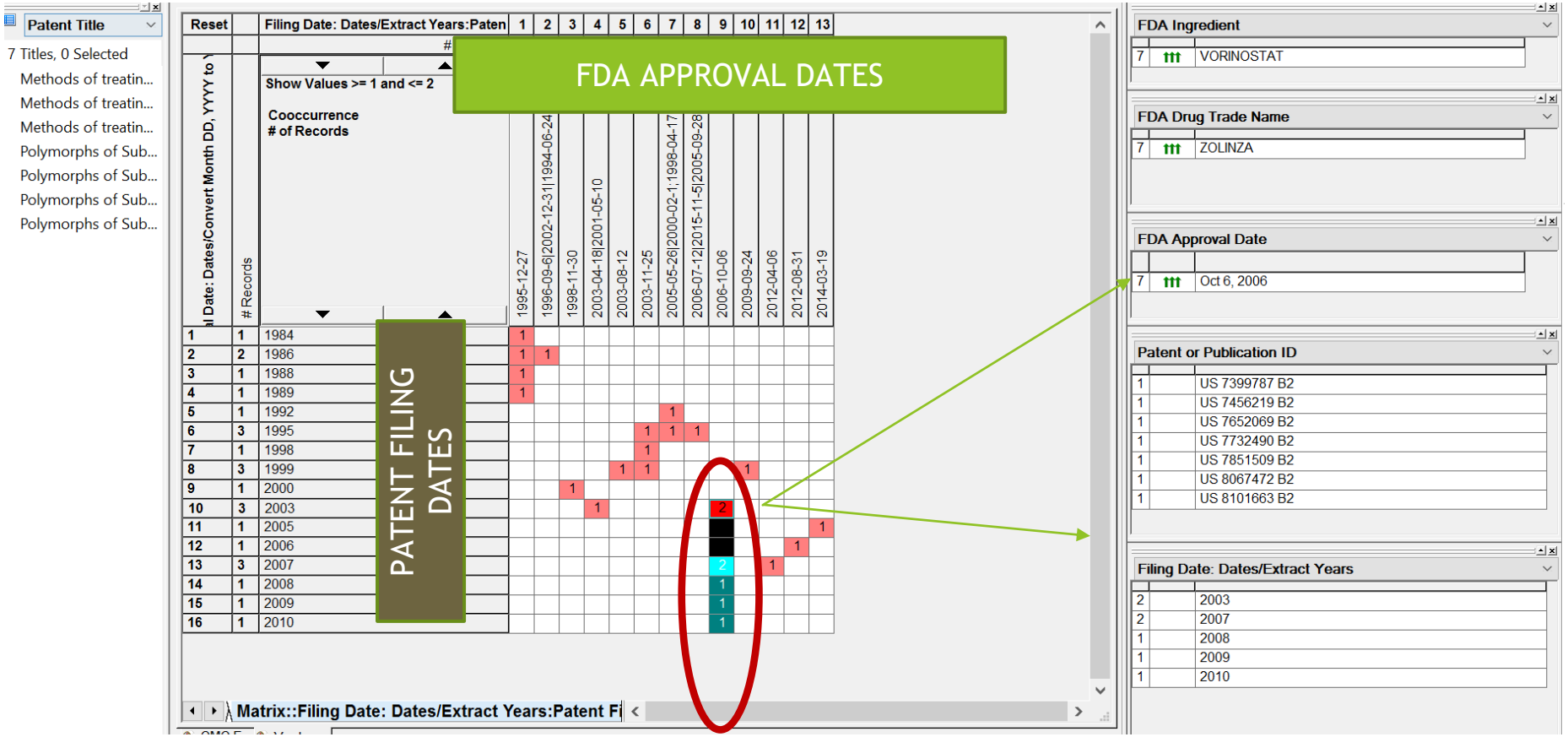
The co-occurrence matrix * shows the 25 granted patents with linkage between NIH grant recipients and FDA orange book applicants. Detailed data is shown below for the Zolinza drug collaboration between Merck and Sloan-Kettering.



Screenshot created using the Vantage Point tool from Search Technology.

Lag Time between Patent Filings and FDA Approvals

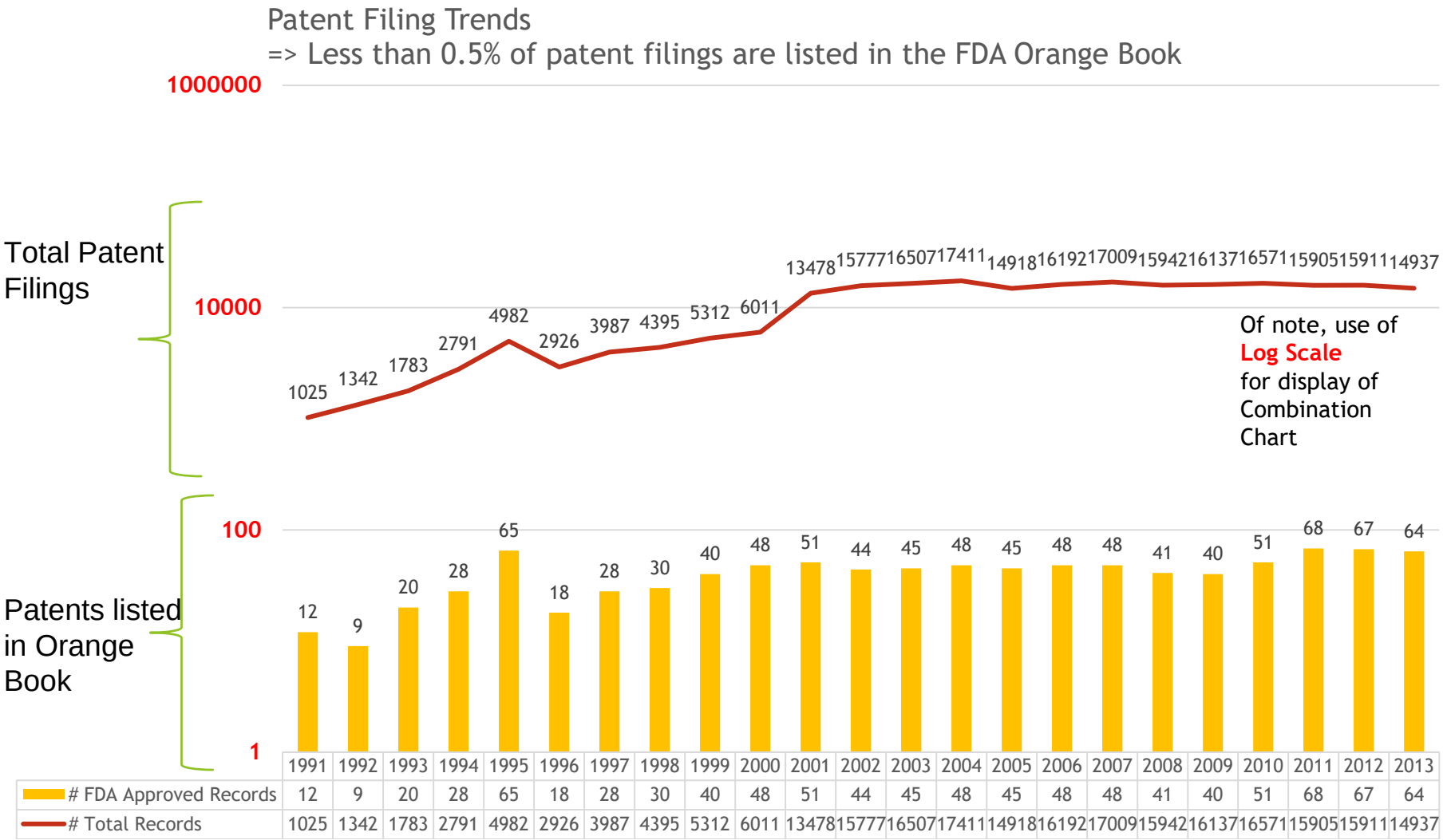
- Analysis of the provided data indicates a lag time of 3 years (or more) between patent filing date and FDA approval date.
- Lag time details for the Drug Zolinza with three years and others with much higher lag times of 10+ years is shown below.



Screenshot created using the Vantage Point tool from Search Technology.

Patent Filing Trends

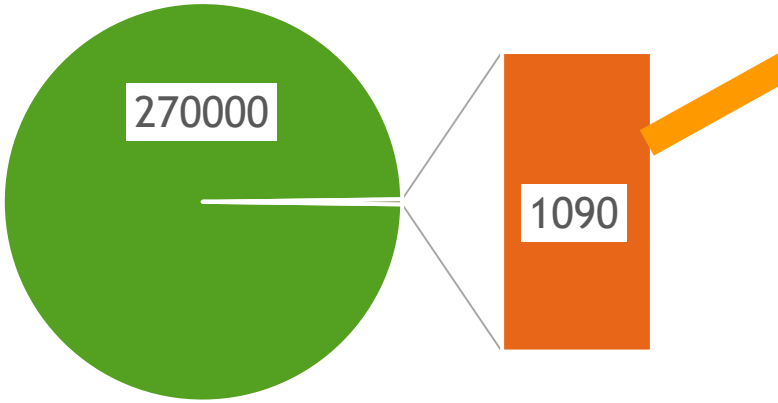
- Analysis of the provided data indicates that there is less than 0.5% probability of a new patent application filing being listed in the FDA Orange Book.



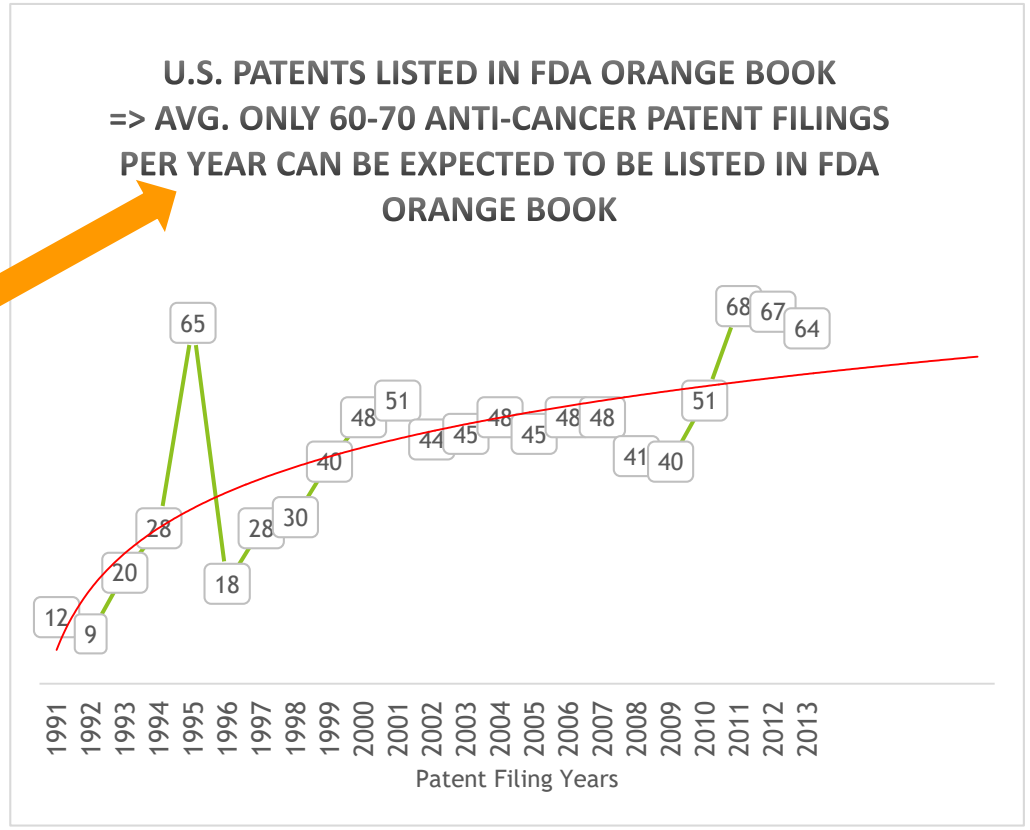
Patent Filing Trends

- Analysis of the provided data indicates that only about 60-70 filings per year can be expected to be listed in the FDA Orange Book.

Patent Filings Per Year
=> Less than 0.5% probability of patent filing being listed in FDA Orange Book

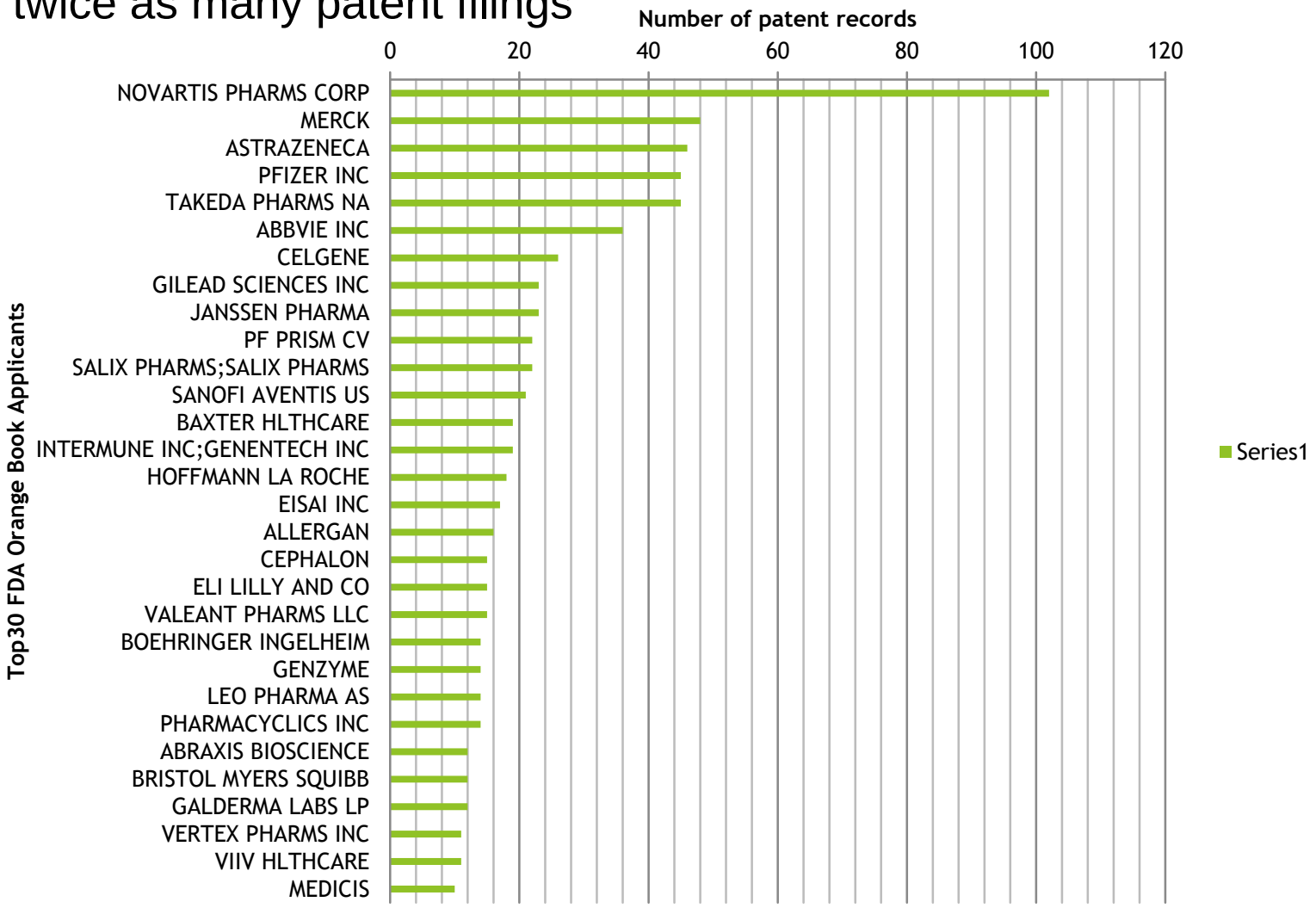


- 270,000 Total U.S. Filings - Patents retrived in data-set
- 1090 US patents listed in Orange Book



Patenting Trends from the FDA Orange Book
Top30 FDA Orange Book Applicants with most patent filings

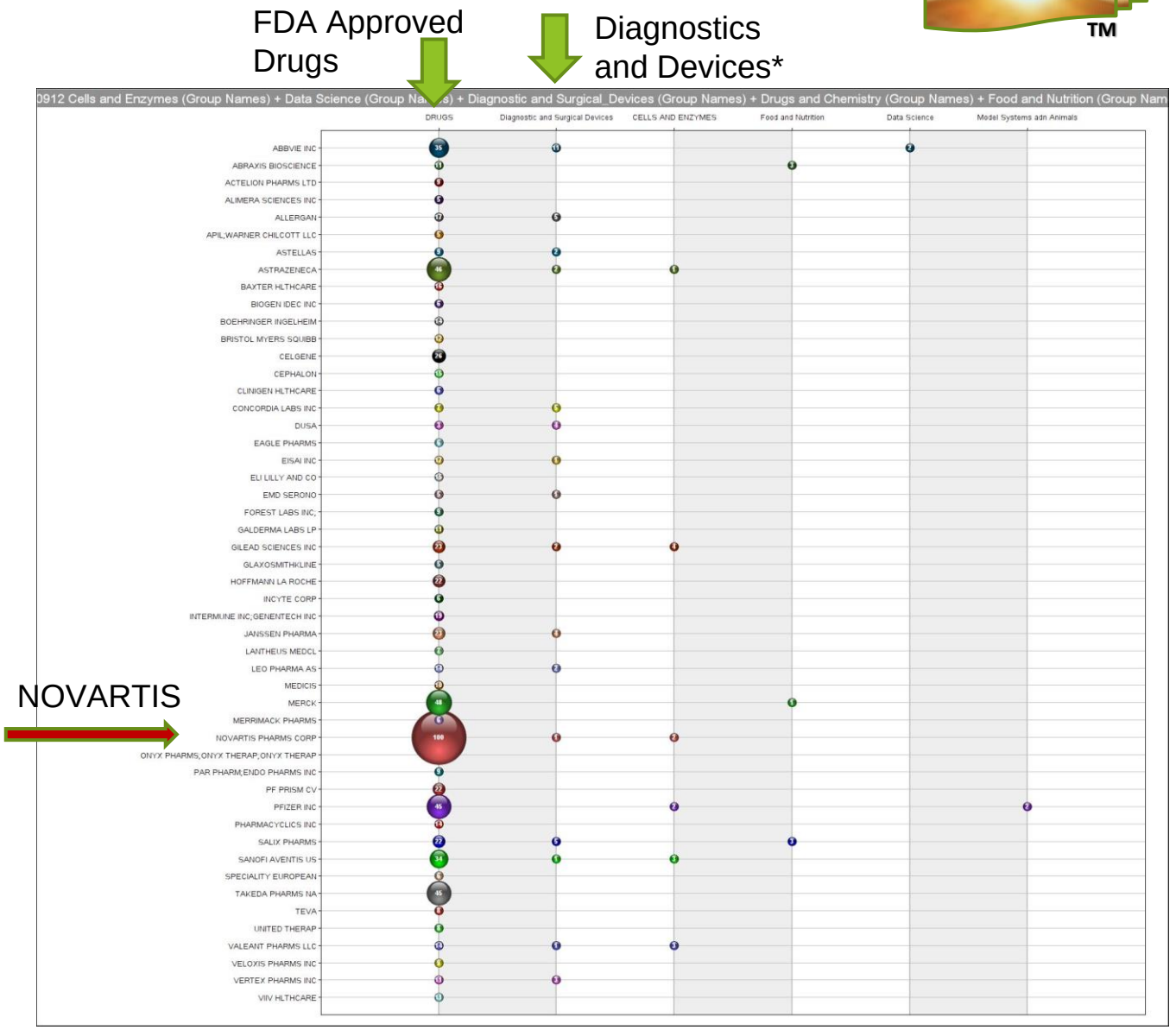
- Analysis of the provided data indicates that Novartis leads with twice as many patent filings



Patenting Trends from the FDA Orange Book

FDA Orange Book Applicants with most patent filings and technology

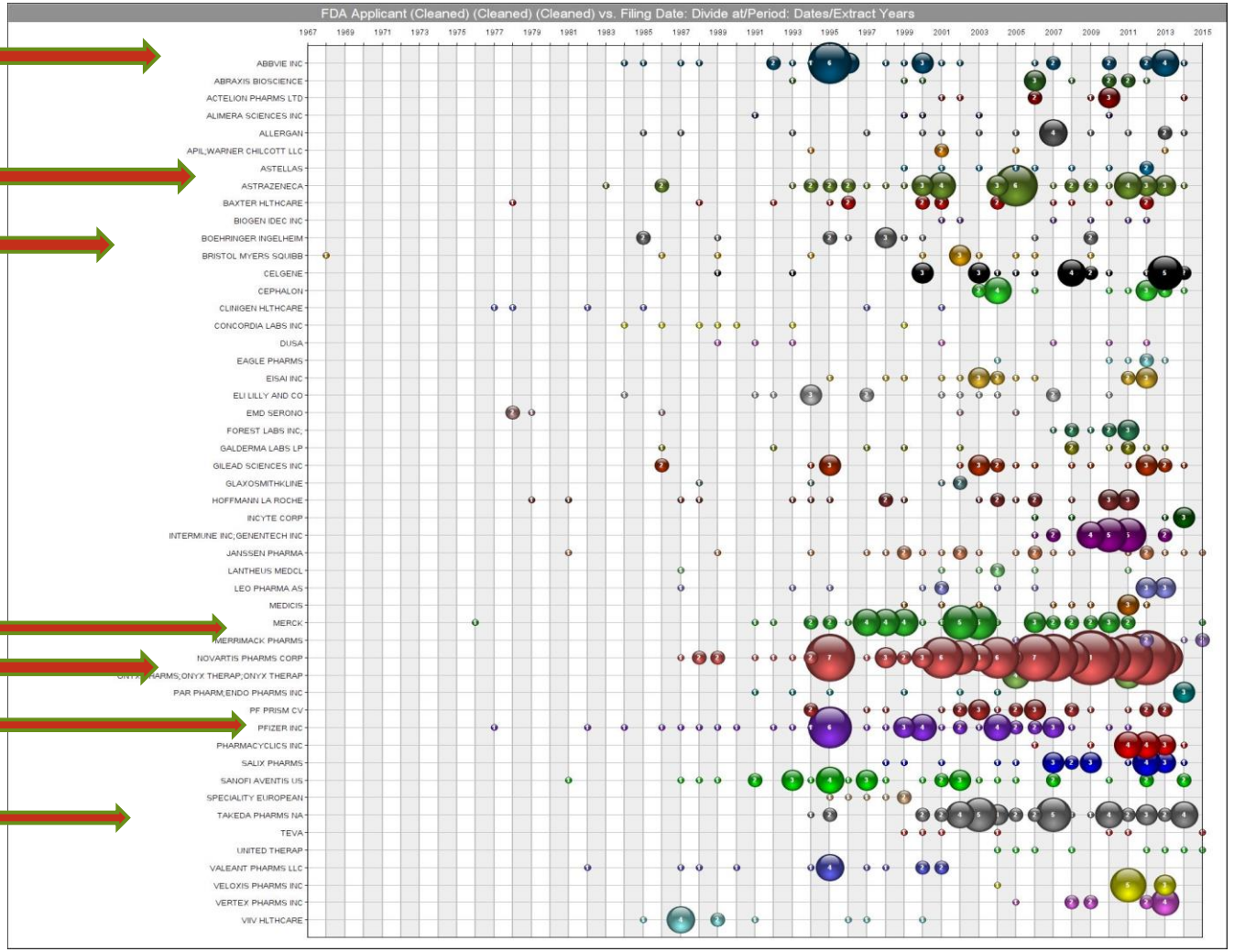
- Analysis of the provided data indicates that **Novartis leads** FDA orange book applicants with most patent filings in chemical drugs



Patenting Trends from the FDA Orange Book

Patent Filings Per Year

- Analysis of the provided data indicates that Novartis has the largest number of anti-cancer patent filings almost every year.
- Of note, Novartis has also recently acquired GSK's cancer patent portfolio.



Abbvie

Astrazeneca

BMS

Merck

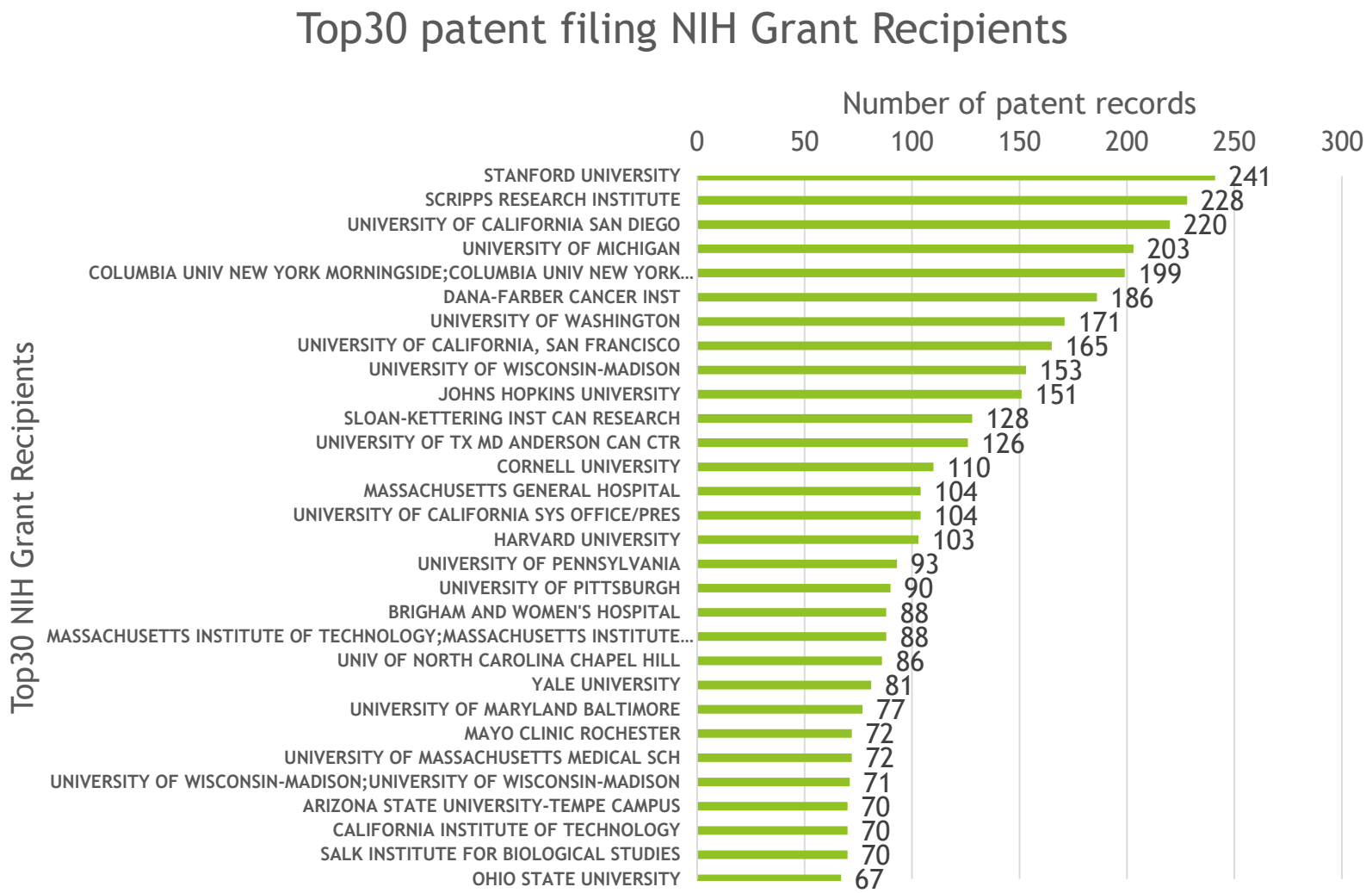
Novartis

Pfizer

Takeda

Top30 patent filing NIH Grant Recipients

- Stanford, Scripps Research, and UCSD lead in patent filings among NIH Grant Recipients



Technology Trends from the provided patent data

Use*

- Analysis of the provided patent data indicate active patenting of antineoplastic preparations for multiple types of cancer

Reset		IPC USE	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		# Records	4982	2926	3988	4395	5312	6011	13478	15777	16507	17411	14918	16192	17009	15942	16137	16571	15905	15912
ates/Extract Ye	# Records	Show Values >= 1 and <= 4469 Cooccurrence # of Records	Patent Filing Year																	
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	2080	Alimentary Track or Digestive System		2	1	2	2	3	23	14	10	17	52	50	117	204	299	531	424	323
2	158	Anaesthetics							1					1	8	11	26	40	51	18
3	5385	Antiinfectives e.g. antivirals,antibacterial, antibiotics	2	1	4	3	10	11	20	23	33	95	205	315	589	802	841	1121	814	480
4	22203	Antineoplastic agents - Multiple or general	4	3	4	9	22	32	58	77	126	297	860	1279	2658	3292	3722	4469	3126	2030
5	617	Antiparasitic agents	1		1			2	2	5	4	6	12	18	52	73	96	147	125	72
6	1939	Blood or extracellular fluid				2	1	4	10	6	9	24	51	72	167	195	306	444	368	272
7	5803	Cardiovascular system			1	3	2	7	28	23	32	58	225	305	657	851	922	1213	865	585
8	3900	Dermatological Disorders	1	2	2	3	4	4	24	13	15	46	127	130	370	453	621	912	695	453
9	121	Drugs used in surgical methods				1	2		2		1	4	6	4	17	11	12	29	25	7
10	852	Endocrine system		1		5	1	4	8	3	6	15	33	38	73	89	118	188	149	116
11	121	General protectives				1	2		2		1	4	6	4	17	11	12	29	25	7
12	1049	Genital or Sexual disorders				1	3	3	18	10	7	16	35	49	107	145	154	221	160	118
13	5832	Immunological or allergic disorders	1		2	4	5	5	18	24	26	64	196	296	675	838	883	1269	910	597
14	5101	Metabolism				2	3	7	27	19	29	51	194	293	607	742	815	1027	772	495
15	698	Muscular or Neuromuscular disorders					1		10	5	5	5	25	25	64	40	83	164	142	123
16	7038	Nervous System	2		1	2	3	7	23	26	43	79	284	421	873	1010	1117	1436	996	687
17	6270	Non-central analgesic, antipyretic or antiinflammatory agents, e.g antirheumatic agents;	1		1	5	4	8	13	32	22	52	213	261	596	784	966	1482	1062	745
18	1999	Opthalmic agents				2	1	4	10	5	5	9	55	63	178	201	317	453	420	266
19	3521	Respiratory System			1	1	4	6	14	18	13	31	114	177	328	506	540	784	570	394
20	4355	Skeletal Disorders		2		1	5	8	19	28	33	53	163	171	459	508	700	1015	696	474
21	1628	Urinary System						4	13	7	7	18	50	49	127	174	254	381	294	240

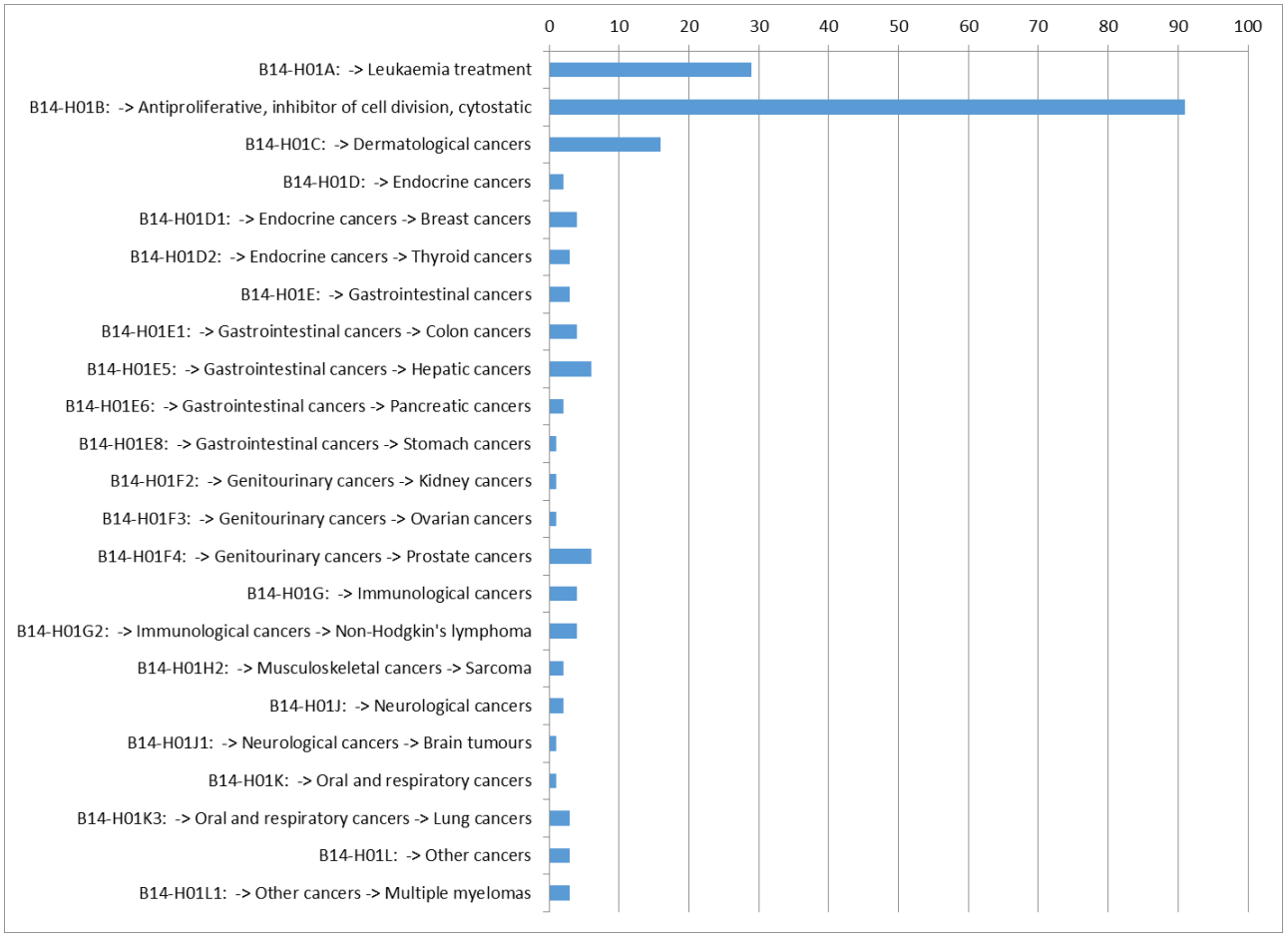
USE

**Type of cancer definitions derived from "A61P" IPC*

Technology Trends from the FDA orange book listed patents

Use (contd.)*

- Analysis of the patent data from the FDA orange book patents indicate active patenting of antineoplastic preparations for multiple types of cancer

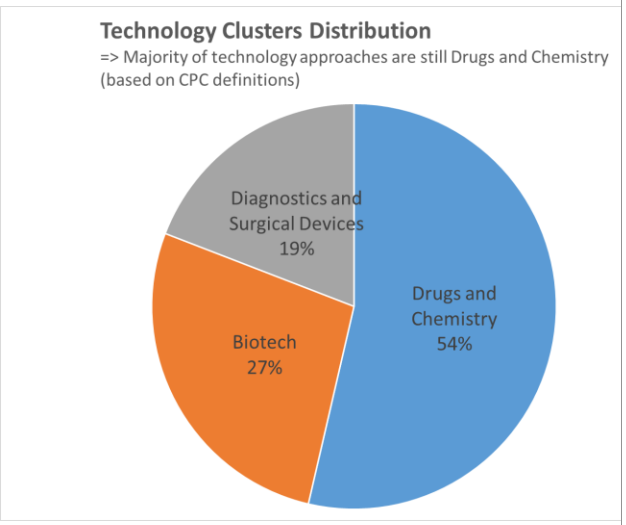


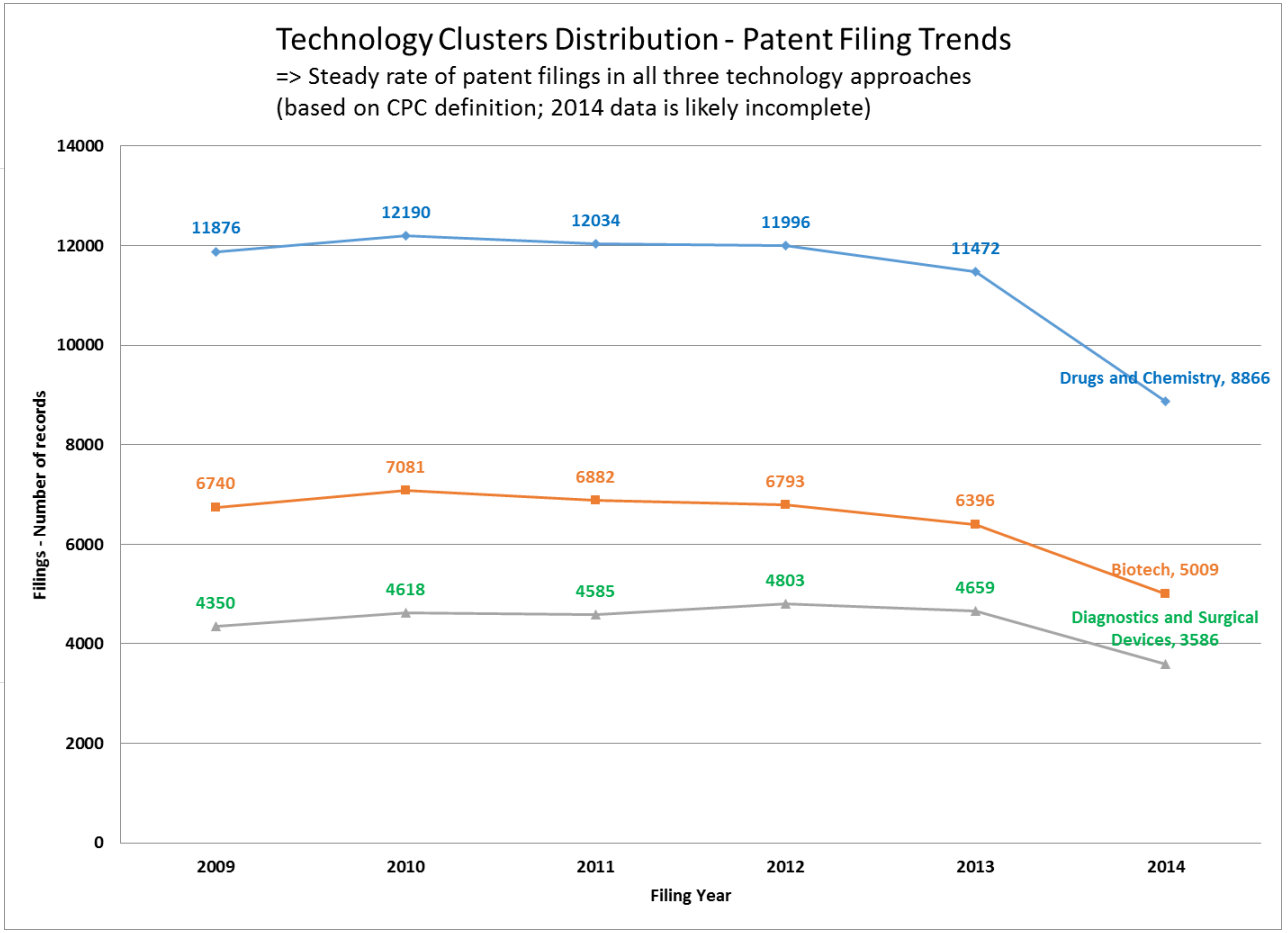
**Type of cancer definitions derived from B14-H01 Derwent Manual Codes*

Technology Trends

Multiple technology approaches to cancer therapy

- In addition to traditional chemical drugs, there is strong interest in biotech, diagnostics, and devices

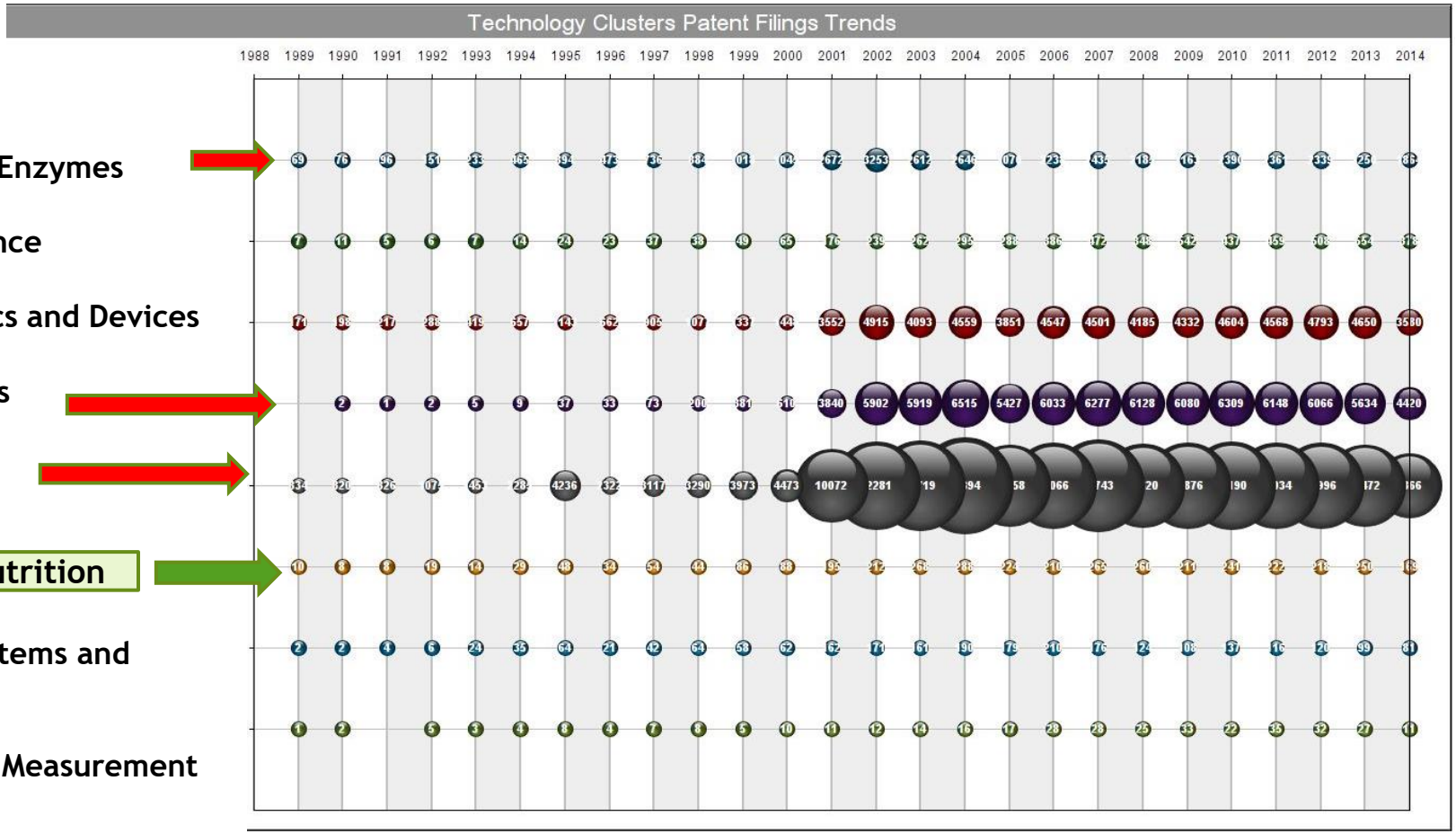




Technology Trends – Peaks and Valleys

Multiple approaches to cancer therapy

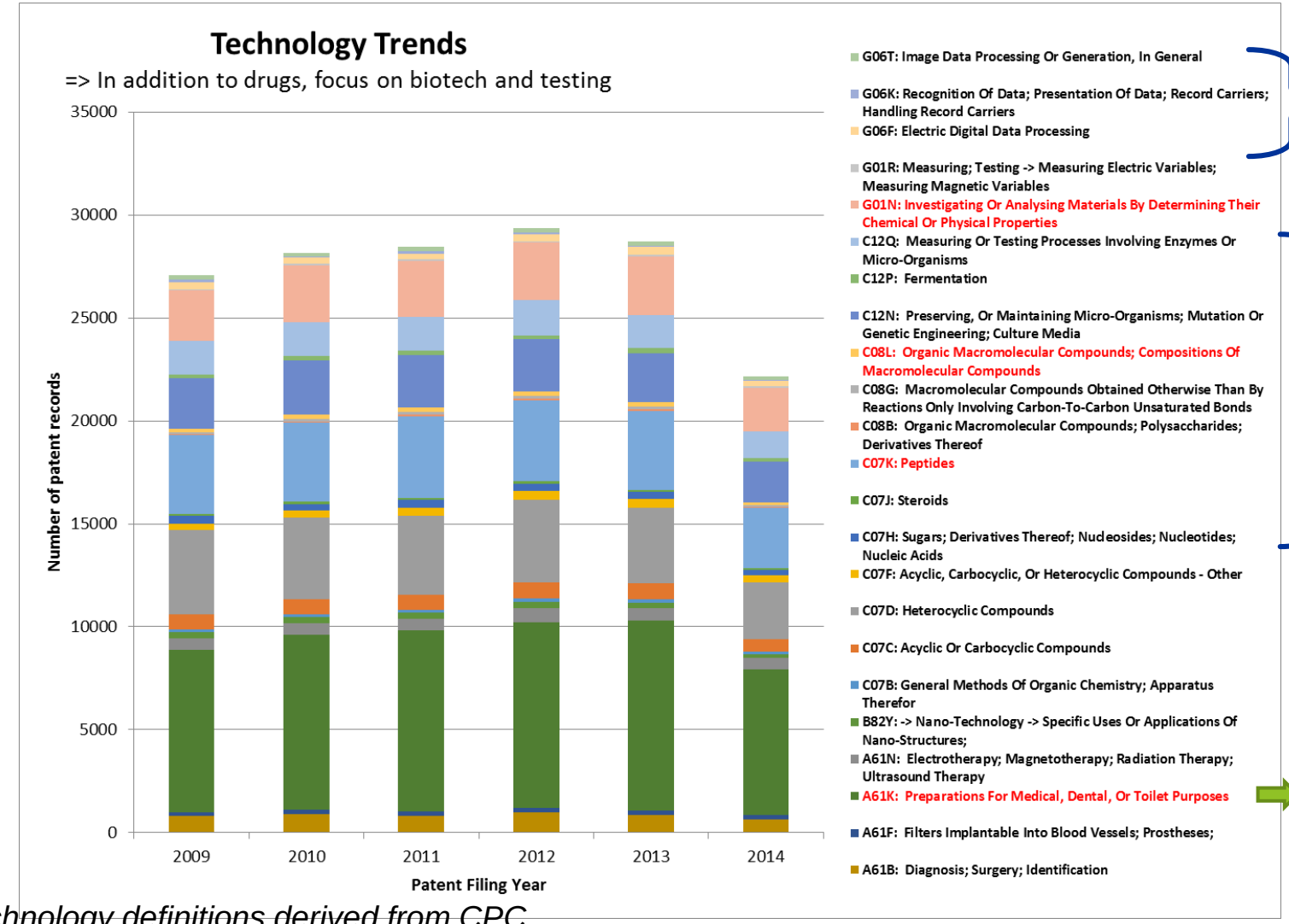
- In addition to chemical drugs, there is strong interest in biotech (especially sequences, antibodies), diagnostics, and devices
- Food and Nutrition appears to be a big opportunity area, especially with a goal of prevention and making cancer a livable disease



Technology Focus – Peaks

Multiple Technology Approaches in recent six years

- In addition to chemical drugs, there is a steady rate of patent filings and a strong interest in biotech (sequences, peptides, macromolecular compounds), diagnostics, data science, and early testing.

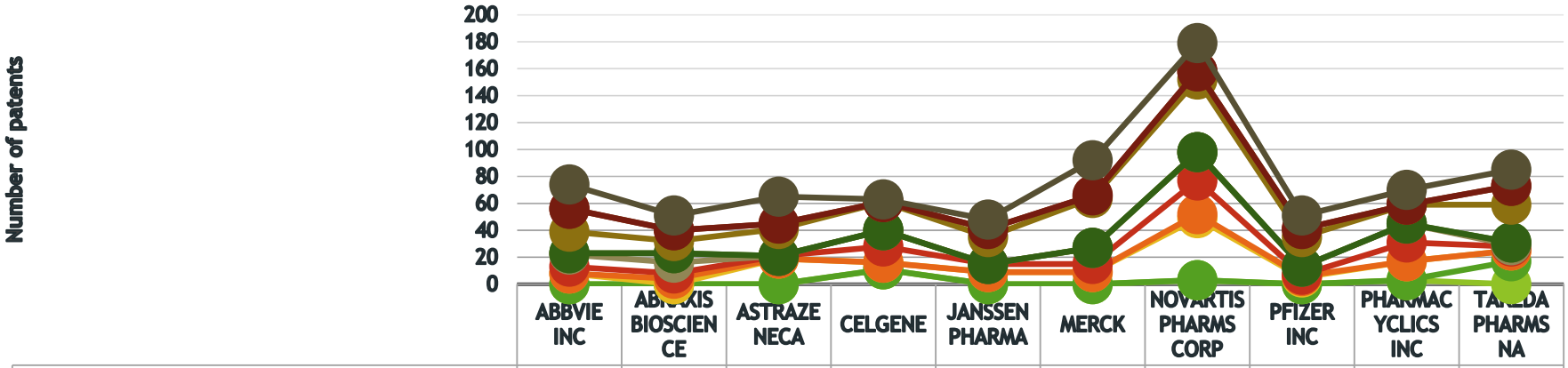


* *Technology definitions derived from CPC*

Technology Trends for FDA Orange book listings
Technology Approaches from FDA applicant

- Novartis leads with the most technology approaches with chemical drugs
- Many more biotech technology approaches are expected in **Purple Book** listings (not shown)

Novartis also leads in technology approaches



	ABBVIE INC	ABRAXIS BIOSCIENCE	ASTRAZENECA	CELGENE	JANSSEN PHARMA	MERCK	NOVARTIS PHARMS CORP	PFIZER INC	PHARMACYCLICS INC	TAKEDA PHARMS NA
Special Physical Forms e.g. Capsules, pills etc	18	11	20	2	7	26	21	10	11	12
Radiation Therapy										
Peptides	17	8	4		6	2	6	6		14
Organic Active Ingredients	16	9	20	21	20	37	54	22	14	28
Ocular implants										
Nano-technology	1	7								2
Mixtures or Combinations	9	8		12		12	21	6	14	1
Mixtures or combination without chemical characterization e.g. protein kinase inhibitors	5	4	2	12	6	6	25	1	14	3
Inorganic Active Ingredients - Heavy metals		4					3	1		
Heterocyclic Compounds	8		19	5	9	9	46	5	14	8
Boron Compounds										17
Antigens or Antibodies				11			3		3	

** Technology definitions derived from CPC*

Technology Focus - Peaks

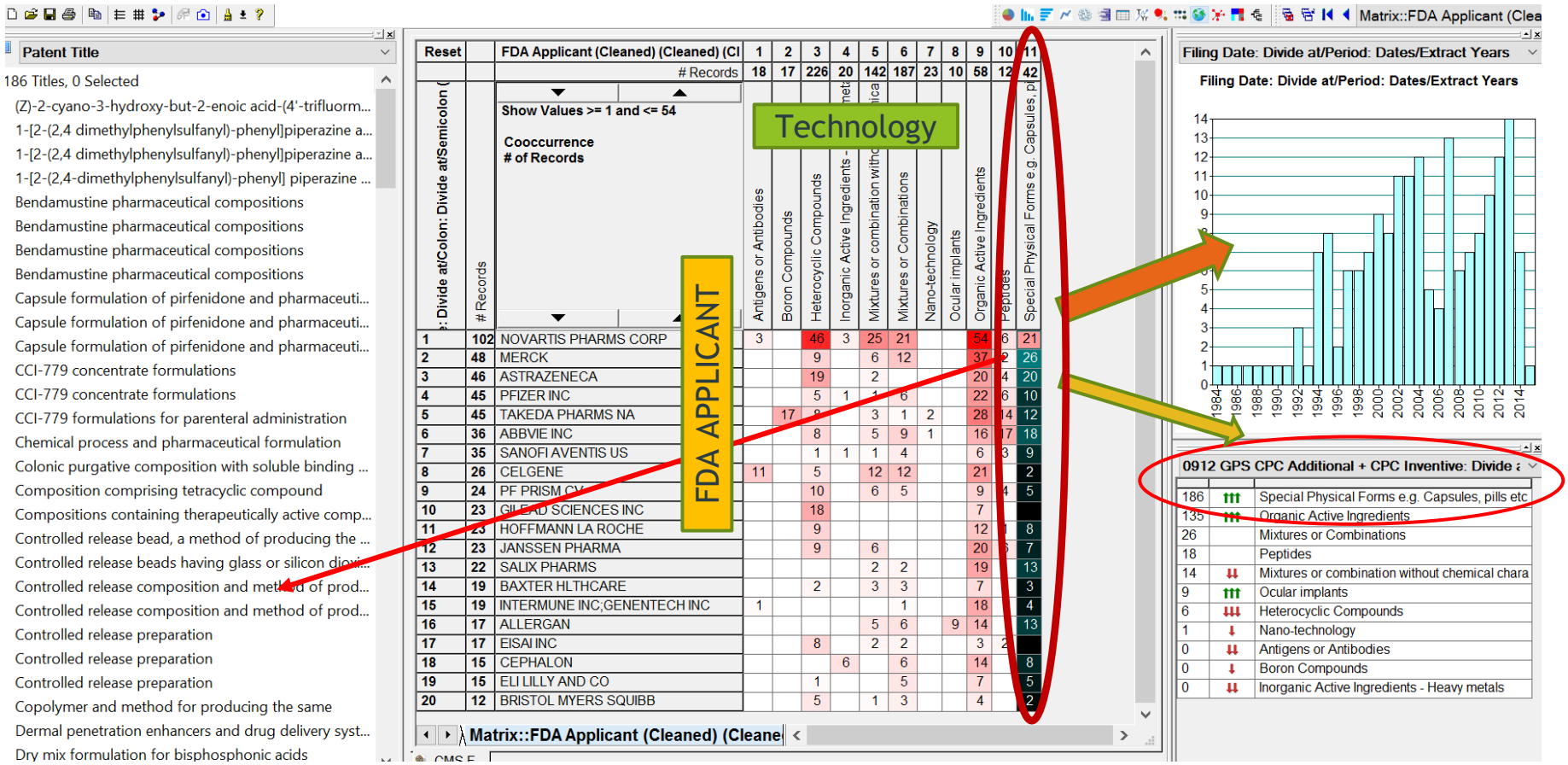
Preparations characterized by special physical form - recent six years

- Most interest in injectable compositions
- Additional interest: site of application (skin), liposomes, and particulate form

# Records	Preparations characterized by special physical form - Deep Dive
1116	A61K9/0014: -> -> -> Galenical forms characterized by the site of application -> Skin
2638	A61K9/0019: -> -> -> Galenical forms characterized by the site of application -> Injectable compositions; Intramuscular, intravenous, arterial, subcutaneous administration; Compositions to be administered through the skin in an invasive manner
492	A61K9/0053: -> -> -> Galenical forms characterized by the site of application -> Mouth and digestive tract
672	A61K9/06: -> -> -> Ointments; Bases therefor; Other semi-solid forms
511	A61K9/08: -> -> -> Solutions
506	A61K9/1075: -> -> -> Dispersions; Emulsions -> Emulsions; Emulsion preconcentrates; Micelles -> Microemulsions or submicron emulsions; Preconcentrates or solids thereof; Micelles
876	A61K9/127: -> -> -> Dispersions; Emulsions -> Liposomes
478	A61K9/1271: -> -> -> Dispersions; Emulsions -> Liposomes -> Non-conventional liposomes
521	A61K9/14: -> -> -> Particulate form
660	A61K9/19: -> -> -> Particulate form -> lyophilised, i.e. freeze-dried, solutions or dispersions
457	A61K9/2018: -> -> -> Pills, tablets, discs, rods -> Excipients; Inactive ingredients -> Organic compounds -> Sugars, or sugar alcohols
611	A61K9/2054: -> -> -> Pills, tablets, discs, rods -> Excipients; Inactive ingredients -> Organic macromolecular compounds -> Polysaccharides -> Cellulose; Cellulose derivatives

Technology Focus
Technology approaches from the FDA Orange Book Applicants

- Increased patent filings in “Special Physical Delivery form” from almost every company



** Screenshot created with the Vantage Point tool from Search Technology.*

Technology Focus - Peaks
Biotech Technologies in recent six years

- Interest in **multiple** biotech technologies (e.g., antibodies, vaccines, cell therapy, stem cells, and bone marrow therapy)

# Records	Top100 CPC A61K
7520	A61K2039/505: -> -> -> **comprising antibodies**
784	A61K2039/507: -> -> -> comprising antibodies -> Comprising a combination of two or more separate antibodies
501	A61K2039/5154: -> -> -> comprising whole cells, viruses or DNA/RNA -> Animal cells -> **Antigen presenting cells [APCs]**
494	A61K2039/5158: -> -> -> comprising whole cells, viruses or DNA/RNA -> Animal cells -> Antigen-pulsed cells e.g. T-cells
793	A61K2039/53: -> -> -> comprising whole cells, viruses or DNA/RNA -> **DNA (RNA) vaccination**
671	A61K2039/545: -> -> -> characterized by the dose, timing or administration schedule
471	A61K2039/57: -> -> -> characterized by the type of response
1564	A61K31/7088: -> -> organic active ingredients -> Carbohydrates; Sugars; Derivatives thereof -> Compounds having three or more nucleosides or nucleotides
867	A61K31/7105: -> -> organic active ingredients -> Carbohydrates; Sugars; Derivatives thereof -> Compounds having three or more nucleosides or nucleotides -> Natural ribonucleic acids
1615	A61K31/713: -> -> organic active ingredients -> Carbohydrates; Sugars; Derivatives thereof -> Compounds having three or more nucleosides or nucleotides -> Double-stranded nucleic acids or oligonucleotides
607	A61K35/12: -> -> **Compositions comprising non-embryonic stem cells; Genetically modified cells**
569	A61K35/17: -> -> -> Blood; Artificial blood -> Lymphocytes; B-cells; T-cells; Natural killer cells; Interferon-activated or cytokine-activated lymphocytes
562	A61K35/28: -> -> Bone marrow; Haematopoietic stem cells; Mesenchymal stem cells of any origin

** Technology definitions derived from CPC*

Technology Focus - Peaks
Biotech Technologies in recent six years (contd.)

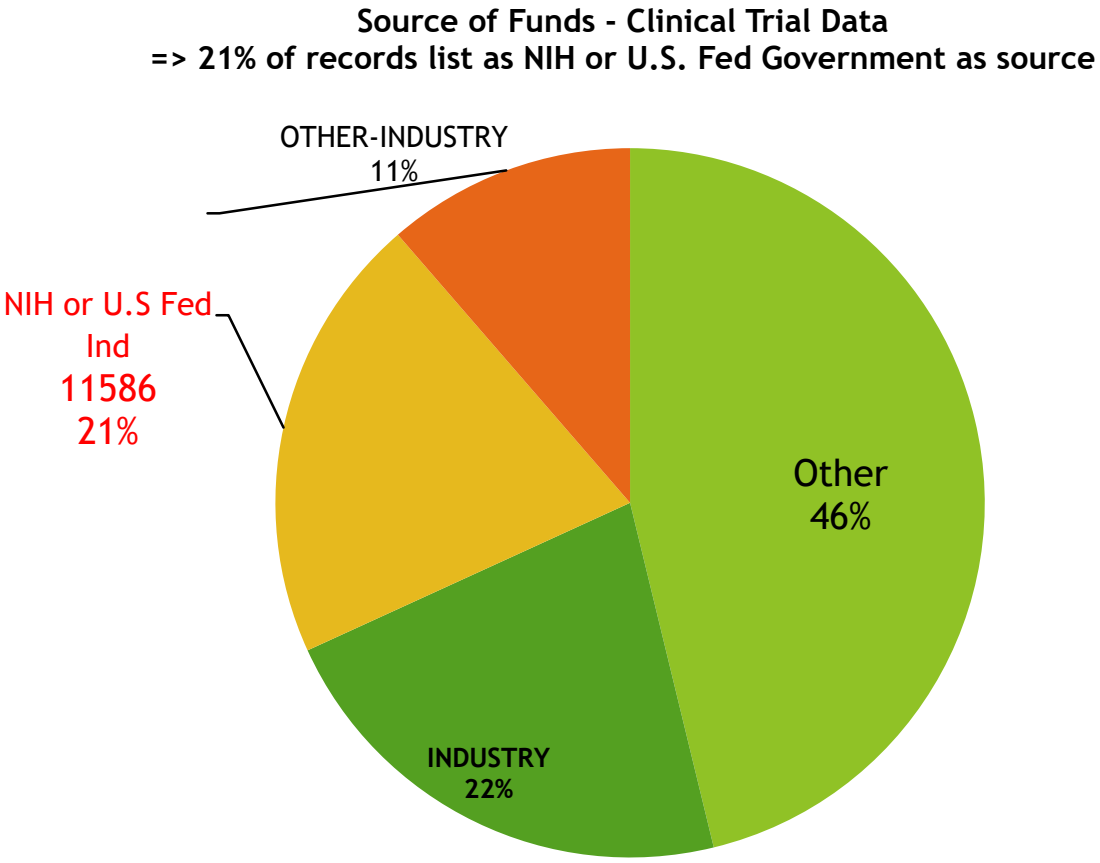
- Interest in multiple biotech technologies (e.g., peptides, immunostimulating additives, and gene therapy)

6394	A61K38/00: -> -> **peptides**
594	A61K38/10: -> -> peptides -> Peptides having up to 20 amino acids in a fully defined sequence; Derivatives thereof -> Peptides having 12 to 20 amino acids
1235	A61K38/1709: -> -> peptides -> Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof -> from animals; from humans -> from vertebrates -> from mammals
457	A61K38/193: -> -> peptides -> Peptides having more than 20 amino acids;-> **Cytokines; Lymphokines; Interferons** -> Colony stimulating factors [CSF]
1480	A61K39/00: -> -> antigens or antibodies
2203	A61K39/0011: -> -> -> Vertebrate antigens -> Cancer antigens
1008	A61K39/12: -> -> -> Viral antigens
1100	A61K39/39: -> -> -> characterized by the **immunostimulating additives**
2853	A61K39/3955: -> -> -> Immunoglobulins; Immune serum -> against materials from animals -> against proteinaceous materials
2164	A61K39/39558: -> -> -> Immunoglobulins; Immune serum -> against materials from animals -> against tumor tissues, cells, antigens
13230	A61K45/06: -> -> active ingredients not provided for in groups to A61K41/00 -> **Mixtures of active ingredients without chemical characterisation**
1070	A61K47/48561: -> -> -> the antibody being targeting a receptor, a cell surface antigen, a cell surface determinant
740	A61K47/48569: -> -> -> the antibody being targeting a determinant of a tumour cell
1752	A61K48/00: -> -> genetic material which is inserted into cells of the living body to treat genetic diseases; **Gene therapy**
520	A61K48/005: -> -> Gene therapy -> characterized by an aspect of the `active` part of the composition delivered

* *Technology definitions derived from CPC*

Clinical Trial Data
Source of Funding

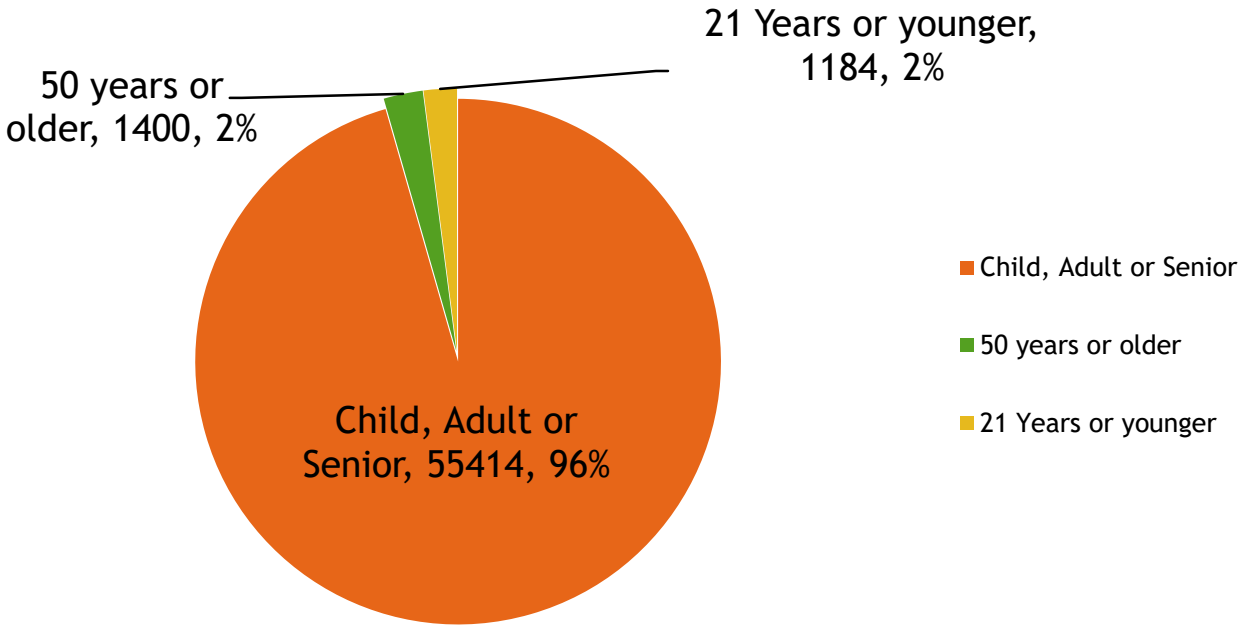
- NIH or U.S federal Agency listed in 21% of anti-cancer clinical trials



Clinical Trial Data
Age Groups

- 96% of the clinical trials are directed towards all age groups

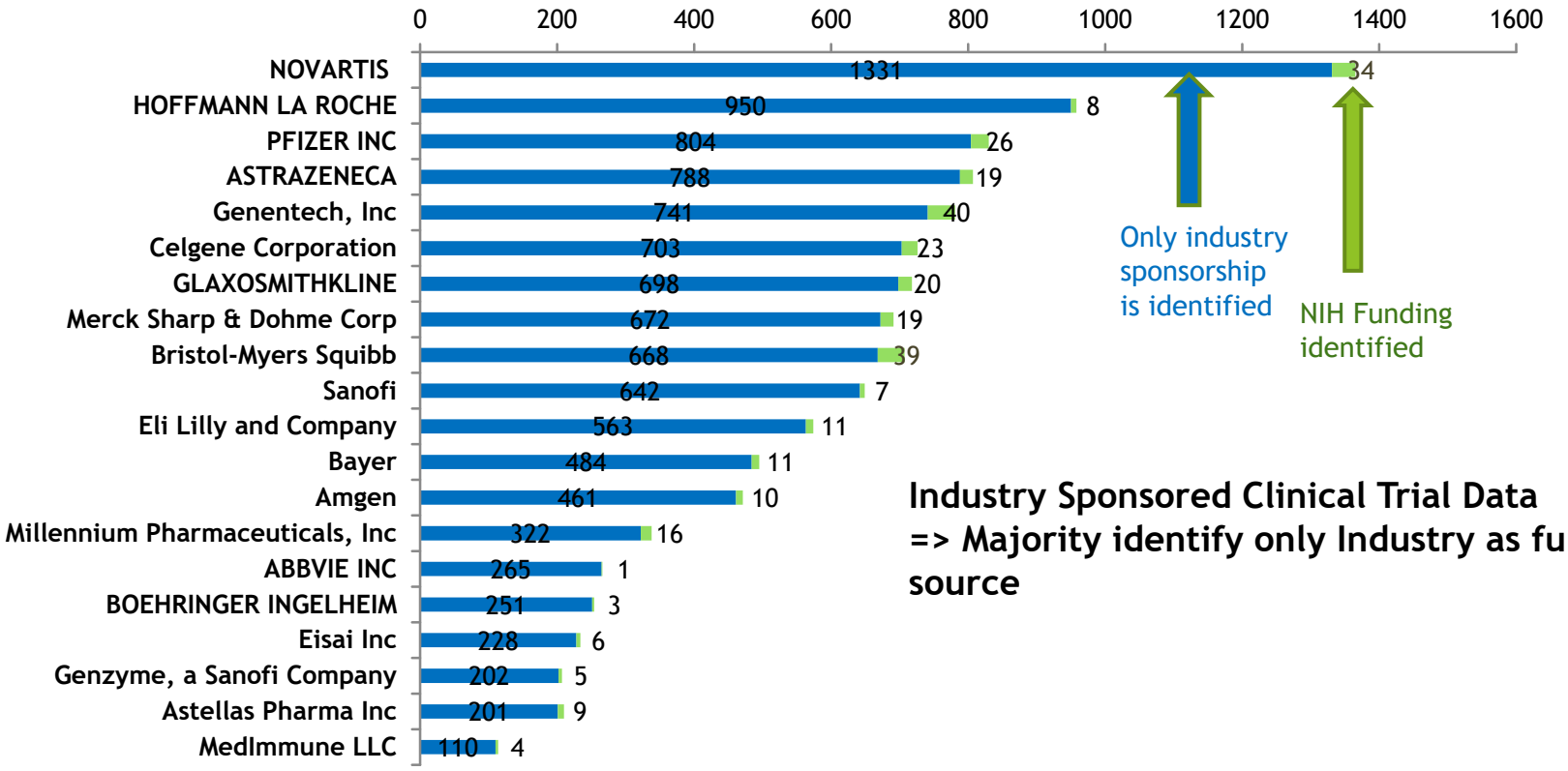
Age-Specific Anti-Cancer Global Trials Distribution
=>96% directed towards all age-groups



Industry Clinical Trial Data

Top Sponsors and Funding Sources

- Novartis has the most clinical trials
- Majority of industry sponsored/collaborator clinical trials only identify Industry or other as funding source

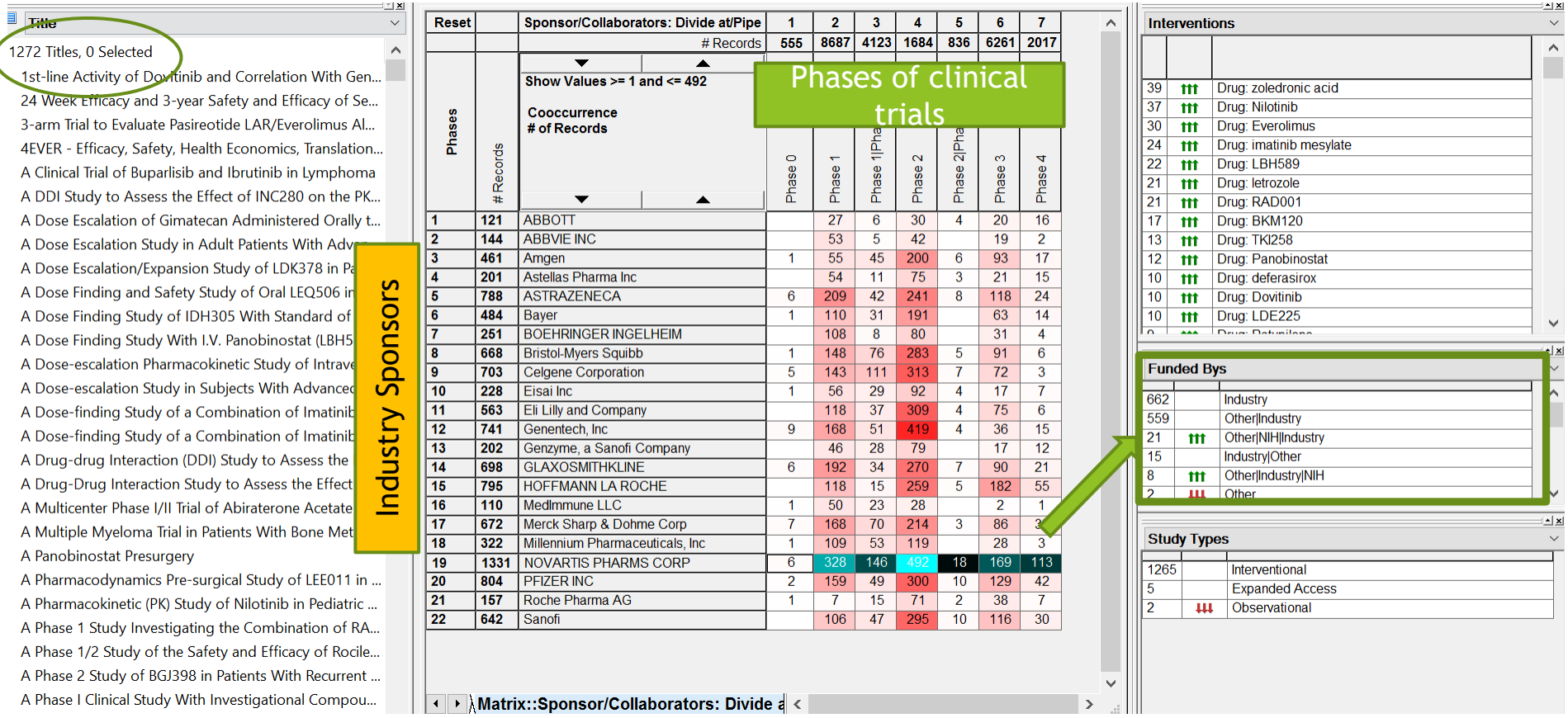


Industry Sponsored Clinical Trial Data
=> Majority identify only Industry as funding source

Industry Clinical Trial Data

Phases of Clinical Trials

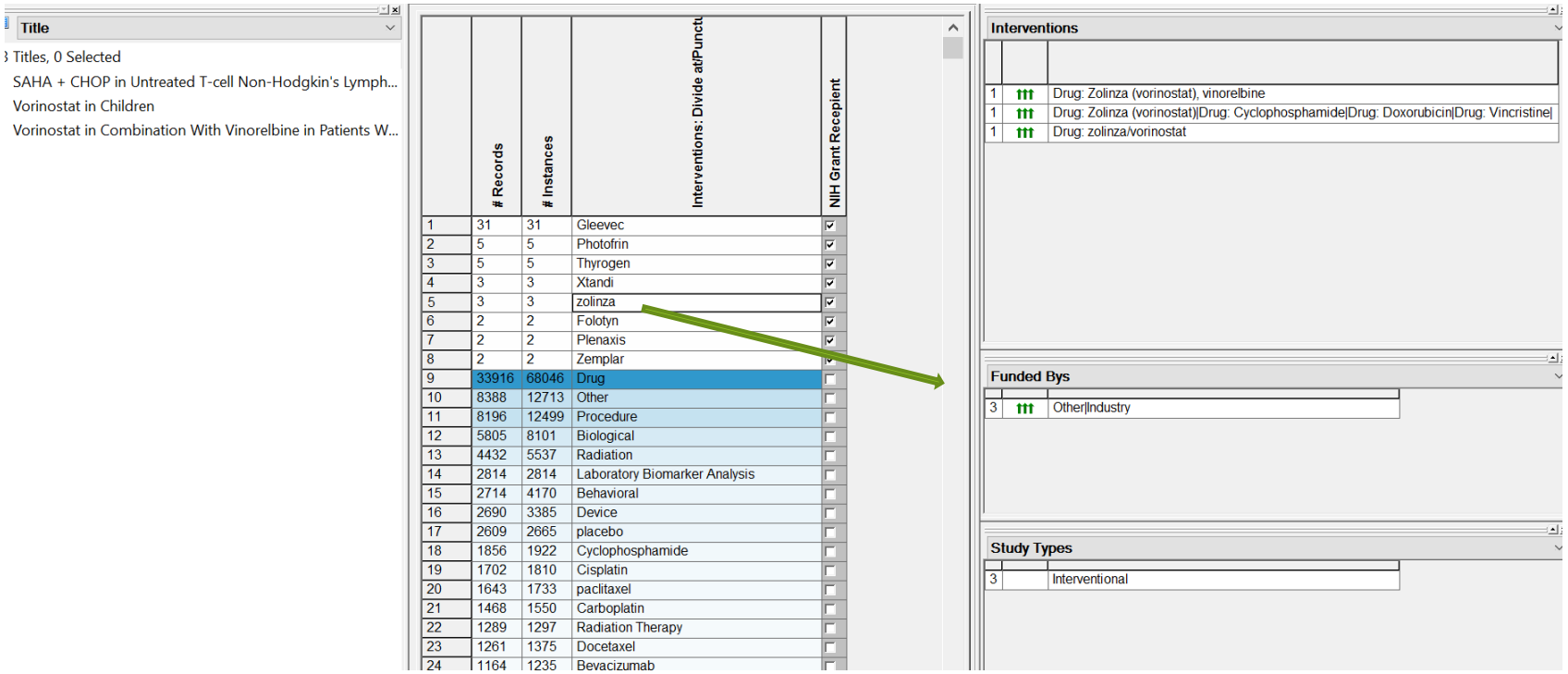
- Novartis even leads with phase 4 clinical trial studies.
- Most studies list industry/other as a funding source.



Industry Clinical Trial Data

Funding Sources - More investigation is needed

- Screenshot shows only other/industry identified as funding source for Drug Zolinza (compare with slide 11 where the drug Zolinza data is linked to Sloan Kettering as NIH grant recipient)
- More investigation is needed to better understand and possibly co-relate all funding sources of industry sponsored clinical trials and research



Title

Titles, 0 Selected

SAHA + CHOP in Untreated T-cell Non-Hodgkin's Lymph...

Vorinostat in Children

Vorinostat in Combination With Vinorelbine in Patients W...

	# Records	# Instances	Interventions: Divide at/Punct	NIH Grant Recepient
1	31	31	Gleevec	☑
2	5	5	Photofrin	☑
3	5	5	Thyrogen	☑
4	3	3	Xtandi	☑
5	3	3	zolinza	☑
6	2	2	Folotyn	☑
7	2	2	Plenaxis	☑
8	2	2	Zemplar	☑
9	33916	68046	Drug	☐
10	8388	12713	Other	☐
11	8196	12499	Procedure	☐
12	5805	8101	Biological	☐
13	4432	5537	Radiation	☐
14	2814	2814	Laboratory Biomarker Analysis	☐
15	2714	4170	Behavioral	☐
16	2690	3385	Device	☐
17	2609	2665	placebo	☐
18	1856	1922	Cyclophosphamide	☐
19	1702	1810	Cisplatin	☐
20	1643	1733	paclitaxel	☐
21	1468	1550	Carboplatin	☐
22	1289	1297	Radiation Therapy	☐
23	1261	1375	Docetaxel	☐
24	1164	1235	Bevacizumab	☐

Interventions

1	†††	Drug: Zolinza (vorinostat), vinorelbine
1	†††	Drug: Zolinza (vorinostat)|Drug: Cyclophosphamide|Drug: Doxorubicin|Drug: Vincristine|
1	†††	Drug: zolinza/vorinostat

Funded Bys

3	†††	Other|Industry

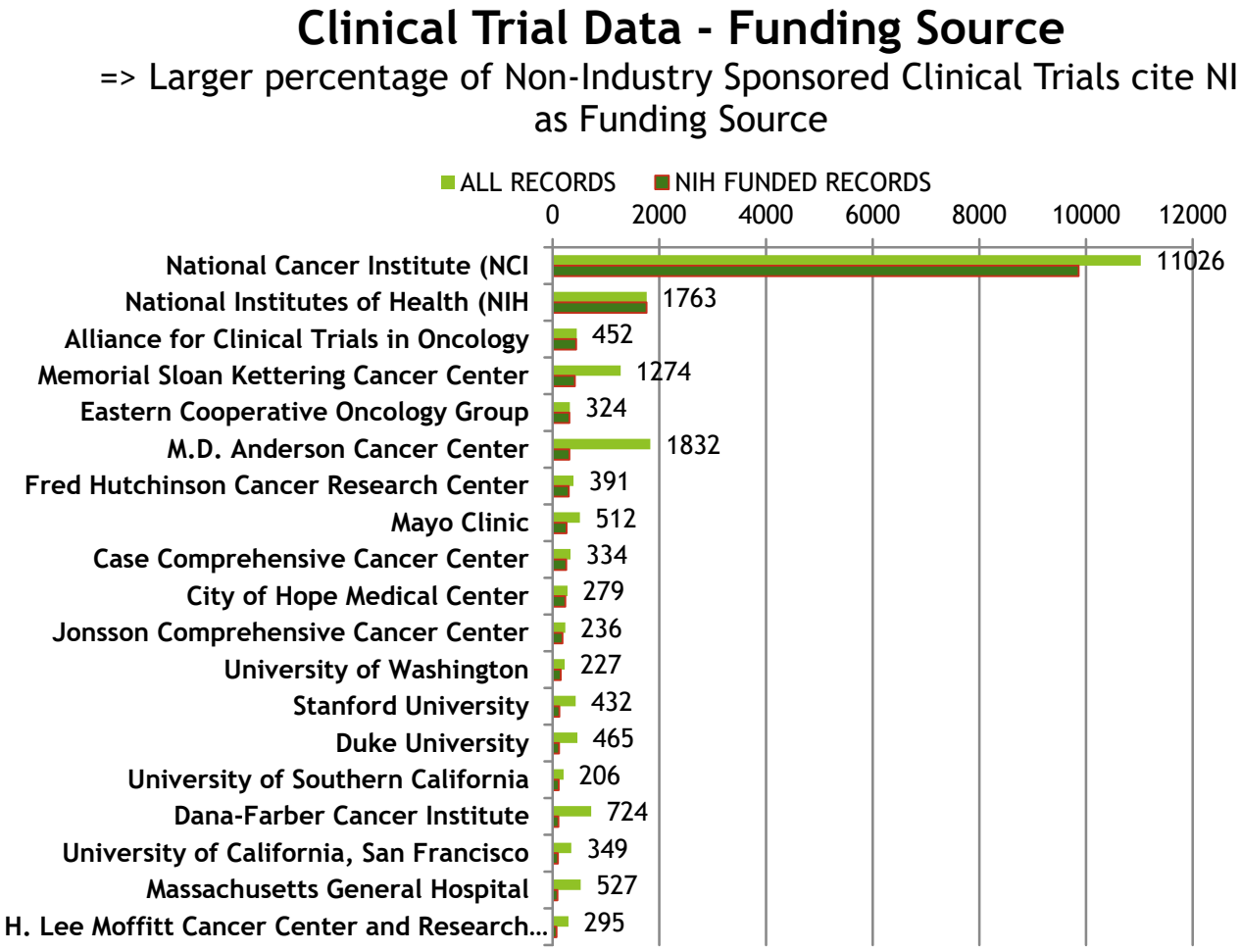
Study Types

3		Interventional

Non-Industry Clinical Trial Data

Top Sponsors and Source of Funding

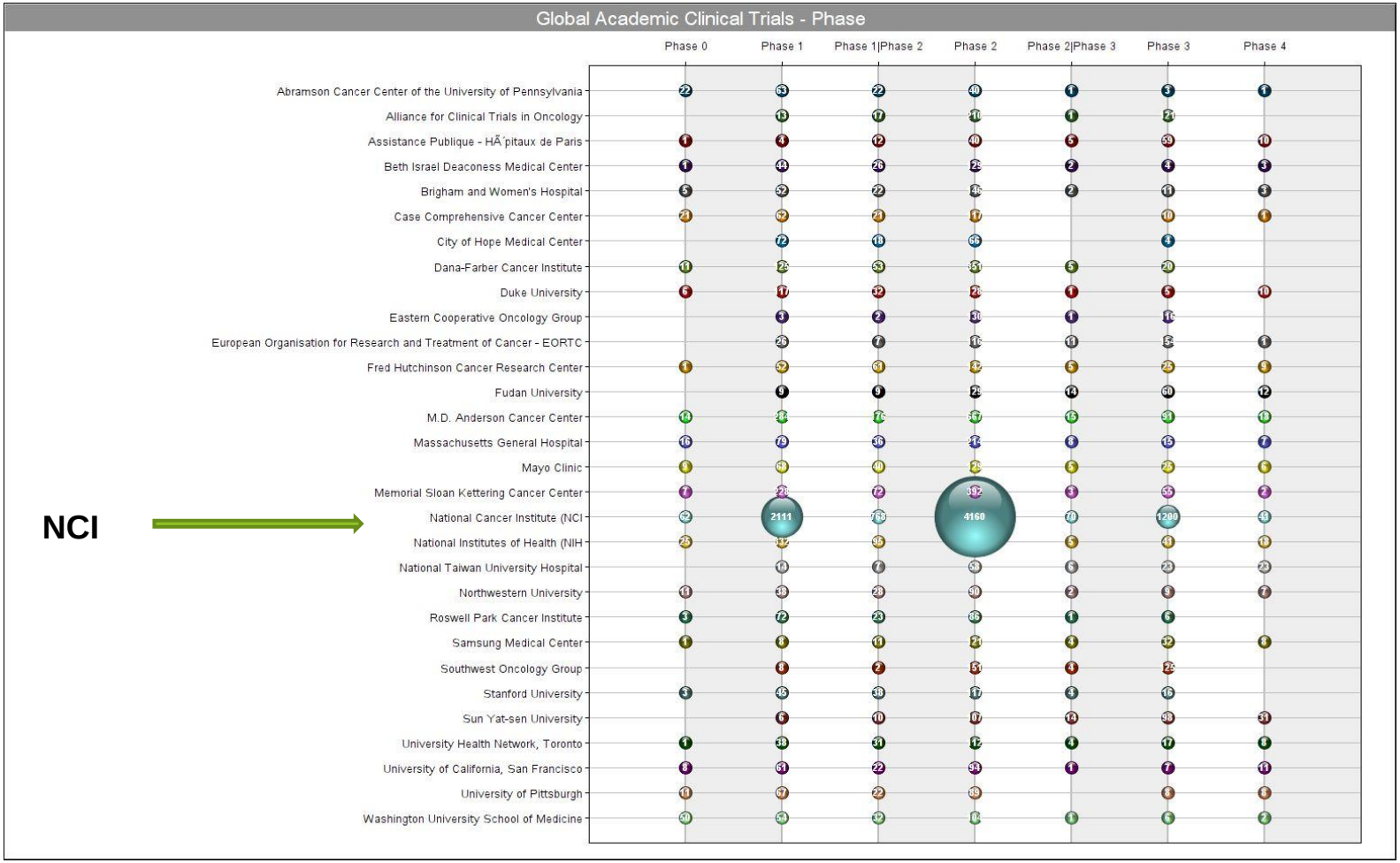
- A majority of non-industry sponsored clinical trials do list or identify NIH as a source of funding.



Non-Industry Clinical Trial Data

Phase of Clinical Trials

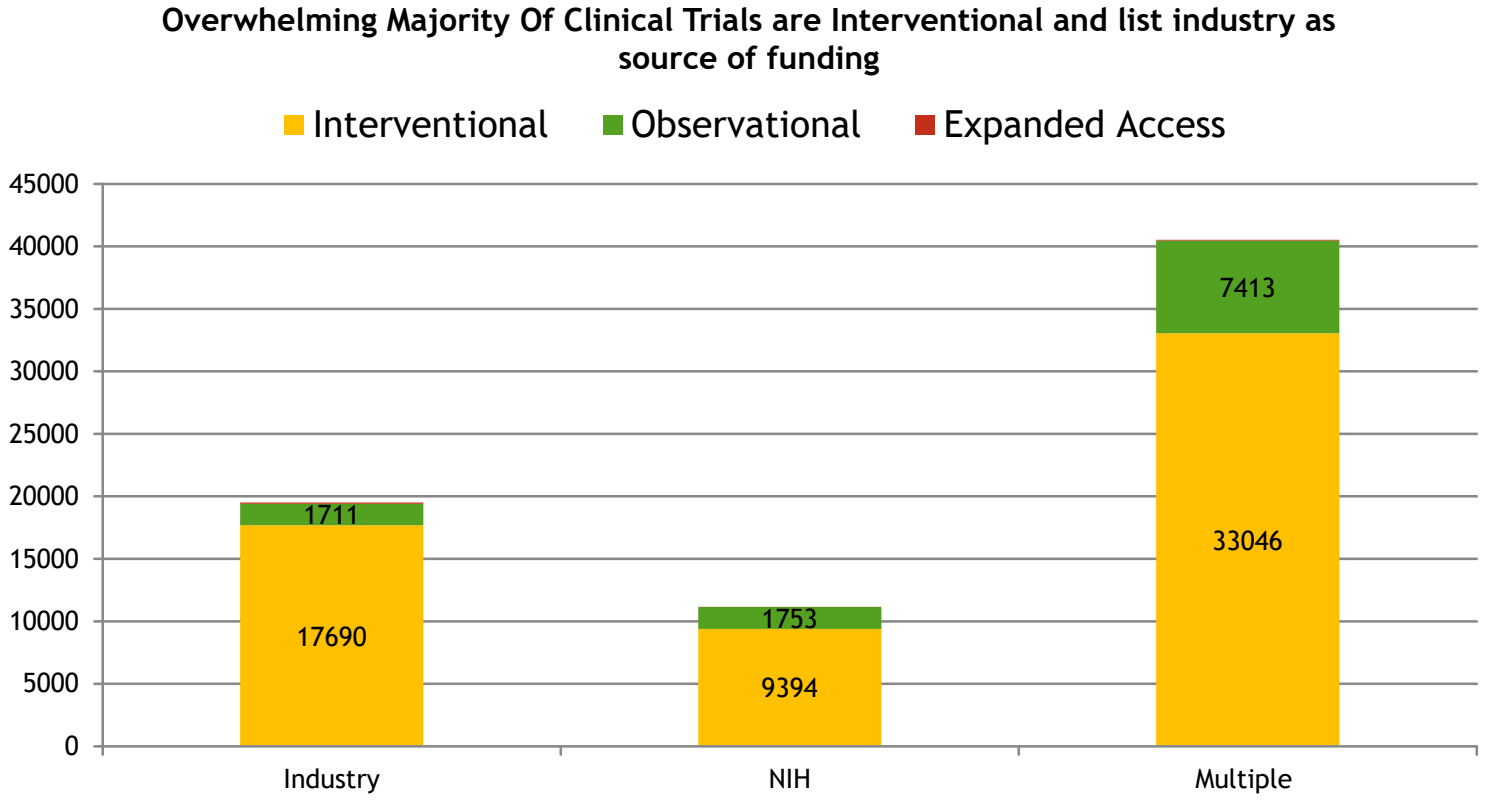
- Analysis of the clinical data show the most studies from NCI in phase 2



Clinical Trial Data

Source of Funding of Trials & Study Types

- Analysis of the industry sponsored clinical data lists industry as a major source of funding of anti-cancer clinical trials
- Overwhelming majority of clinical trials are interventional
- More investigation is warranted



Questions?

- For more information, any questions or feedback feel free to connect with us: mailto:info@RiserIP.com

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Biography:
Yateen Pargaonkar is the Managing Partner of Riser IP, LLC. Till recently, Yateen was the IP Competitive Trends Manager at Chevron Energy Technology Company. His patent analytics and competitive intelligence experience includes leadership roles of increasing responsibility in the energy sector, consumer goods, biotech, and pharmaceuticals. Previously, Yateen was a Competitive Intelligence Manager and a Senior Information Scientist at Procter & Gamble. He has also worked at different IP law firms and taught a course at UCSD on Patent Searching & Internet Research. Yateen has degrees in chemistry, biochemistry, and molecular biology, as well as three years of research experience at Columbia University. He is a registered U.S. Patent Agent and an active member of PIUG.