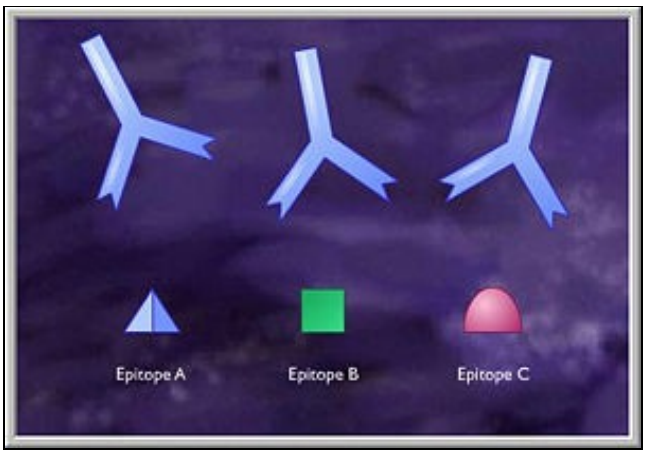
Antibody against TNF

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Objective



Anitgen-Antibody binding Source

1. To map the existence and status of pending patent applications and patents filed in Russia (either directly at the Russian patent office or via the Eurasian Patent Office) that are directed at anti-TNFalpha antibodies, including antibodies such as infliximab (Remicade), adalimumab (Humira), certolizumab pegol (Cimzia), and golimumab (Simponi), and their uses.

Background

Tumor necrosis factor

Tumor necrosis factor is a cytokine involved in systemic inflammation and is a member of a group of cytokines that stimulate the acute phase reaction. The primary role of TNF is in the regulation of immune cells. TNF is also able to induce apoptotic cell death, to induce inflammation, and to inhibit tumorigenesis and viral replication. Dysregulation of TNF production has been implicated in a variety of human diseases, as well as cancer **Soruce** TNF is critically involved in the pathogenesis of several chronic inflammatory diseases. Monoclonal antibodies against TNF are currently used for the treatment of rheumatoid arthritis and Crohn's disease. **Dalum et al., 1999**

Anti-TNF antibody

Monoclonal antibodies to tumor necrosis factor alpha (TNF-alpha) and soluble receptor complexes comprising the extramembrane portion of the TNF receptor coupled with the Fc portion of the human IgG1 molecule have been utilized as therapies for severe sepsis and septic shock. **Abraham, 2004** A review about TNF-?, based on 78 published articles, using TNF-? antibody is **summarized here**

Since tumor necrosis factor (TNF) plays an important role in host defense and tumor growth control. Therefore, anti-TNF antibody therapies may increase the risk of serious infections and malignancies. To assess the extent to which anti-TNF antibody therapies may increase the risk of serious infections and malignancies in patients with rheumatoid arthritis a study has been conducted by **Bongartz et al., 2006**

Search strategy

To capture the Russian patents a 3 way search strategy was built:

- Micropatent full text searches on English patents and then taking out Russian family members from the on target English patents
- Searching patents with keywords and class codes having country code RU (Russia) and EA (Eurasia) in Micropatent INPADOC
- Searching for patents in Eurasian patent office and Russian patent office, individually, with class codes and keywords

Micropatent full text search

Search logic: To first search for all English patents (such as US, WO, EP etc.) with keywords given below and then filter out patents which have Russian family members.

- Database: Micropatent-Full text

Issue/Publication date: <=20100405

Sr. No.	Search concept	Keywords	Hits
1	Keywords based search	((Antibod* OR (Anti ADJ1 bod*) OR Immunoglobulin*1 OR (Immuno ADJ1 globulin*1) OR MAB OR MABS OR Infliximab OR Remicade OR adalimumab OR Humira OR certolizumab OR pegol OR Cimzia OR golimumab OR Simponi) AND (((Tumour OR Tumor) ADJ2 (necros*2) ADJ2 (factor*1)) OR *TNF OR TNF* OR cachexin OR cachectin))	9861 hits
2	Key assignee with TNF keywords	**Assignee/Applicant:** Centocor OR (Johnson ADJ2 Johnson) OR (Mitsubishi ADJ 1Tanabe ADJ1 Pharma*) OR (Xian ADJ1 Janssen) OR (Schering-Plough) OR Abbott OR (BASF ADJ 1Knoll) OR (Cambridge ADJ1 Antibody ADJ1 Technology) OR Medimmune OR (UCB ADJ1 Pharma) **AND** **Keywords in Claims, Tittle and Abstract:** TNF* OR (Tumour ADJ2 Necrosis ADJ2 factor*) OR *TNF OR (Tumor ADJ2 Necrosis ADJ2 factor*)	517 hits
3	Key assignee with drug names	**Assignee/Applicant:** Centocor OR (Johnson ADJ2 Johnson) OR (Mitsubishi ADJ 1Tanabe ADJ1 Pharma*) OR (Xian ADJ1 Janssen) OR (Schering-Plough) OR Abbott OR (BASF ADJ 1Knoll) OR (Cambridge ADJ1 Antibody ADJ1 Technology) OR Medimmune OR (UCB ADJ1 Pharma) **AND** **Keywords in Claims, Tittle and Abstract: Simponi OR Remicade OR Humira OR Cimzia**	10
4	Class based search	**ECLA:** C07K0014525 OR C07K0014705Q OR C07K0014705R OR C07K0014715B OR C07K001628Q OR C07K001628R OR C07K01624B OR A61K003819A **Any classification:** C070014525 OR C12N001528	293 hits
Final	**1 OR 2 OR 3 OR 4**		**10190 patents (3772 unique records) (337 records having RU/EA family member)**

Micropatent INPADOC search

Search logic: Micropatent-INPADOC search bibliographic data for 71 countries and legal status for 42. A search strategy based out of keywords and classes was built to search patents having country code RU (Russia) and EA (Eurasia) in Micropatent INPADOC

- Issue/Publication date: <=20100405

Sr. No.	Search concept	Keywords	Hits
1	Keywords based search	((Antibod* OR (Anti ADJ1 bod*) OR Immunoglobulin*1 OR (Immuno ADJ1 globulin*1) OR MAB OR MABS OR Infliximab OR Remicade OR adalimumab OR Humira OR certolizumab OR pegol OR Cimzia OR golimumab OR Simponi) AND (((Tumour OR Tumor) ADJ2 (necros*2) ADJ2 (factor*1)) OR *TNF OR TNF* OR cachexin OR cachectin))	48 hits
2	ECLA classes specific for Anti-TNF antibody	C07K01628Q OR C07501628R OR C07K01624B	51 hits
3	ECLA classes specific for TNF with Antibody keywords	A61k03819A OR C07K014525 OR C07K014705Q OR C07K014705R OR C07K014715B AND ((Antibod* OR (Anti ADJ1 bod*) OR Immunoglobulin*1 OR (Immuno ADJ1 globulin*1) OR MAB OR MABS) OR Infliximab OR Remicade OR adalimumab OR Humira OR certolizumab OR pegol OR Cimzia OR golimumab OR Simponi)	28 hits
4	IPC classes specific for TNF with Antibody keywords	C07014525 OR C12N01528 AND ((Antibod* OR (Anti ADJ1 bod*) OR Immunoglobulin*1 OR (Immuno ADJ1 globulin*1) OR MAB OR MABS) OR Infliximab OR Remicade OR adalimumab OR Humira OR certolizumab OR pegol OR Cimzia OR golimumab OR Simponi)	5 hits
5	**1 OR 2 OR 3 OR 4**		**100 Hits (87 unique records)**

Eurasian patent office search

Search Logic: Eurasian patent office allows searching in Russian and Eurasian patent databases. Search was performed based on keywords and class codes as shown below.

EA@ Eurasian patent office

- All the records were analyzed

Sr. No.	Search concept	Keywords	Hits
1	Keywords based search	(Tumor* AND Factor*) OR TNF*	11
2	Specific class based search	IPC: C07K14/525 OR C12N15/28	3
3	Broad class based search	IPC: A61K38/19 OR C07K14/705 OR C07K14/715 OR C07K16/28 OR C07K16/24	34

RU@ Eurasian patent office

- All the records were analyzed

Sr. No.	Search concept	Keywords	Hits
1	Keywords based search	(Tumor* AND Factor*) OR TNF*	52
2	Specific class based search	IPC: C07K14/525 OR C12N15/28	11
3	Broad class based search	IPC: A61K38/19 OR C07K14/705 OR C07K14/715 OR C07K16/28 OR C07K16/24	174

Russian Keyword Search

- Russian technical keywords were searched & identified from the relevant Russian patent document and confirmed with the corresponding English patent document and verified with the google translator.
- Eurasian Patent Office allows to search both in the English language and Russian language.

S.No	Russian Keywords	English Keywords
1	???	TNF
2	???-alpha	TNF-alpha
3	?????? ??????? ???????	tumor necrosis factor
4	????-TNF ?????	anti-TNF alpha
5	????-TNF	anti-TNF
6	TNF ?????	TNF alpha

Class codes

ECLA class codes

Sr. No.	Class code	Definition
1	A61k03819A	Medicinal preparations containing peptides - Tumor necrosis factor
2	C07K014525	Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof - Tumor necrosis factor (TNF)
3	C07K014705Q	Peptides having more than 20 amino acids - NGF/TNF-superfamily, e.g. CD70, CD95L, CD153, CD154 (NGF C07K14/48 , TNF C07K14/525)] [N9706]
4	C07K014705R	Peptides having more than 20 amino acids - NGF-receptor/TNF-receptor superfamily, e.g. CD27, CD30, CD40, CD95
5	C07K014715B	Peptides having more than 20 amino acids - for tumor necrosis factor (TNF), for lymphotoxin
6	C07K01628Q	Immunoglobulins [IGs], e.g. monoclonal or polyclonal antibodies - against the NGF/TNF superfamily, e.g. CD70, CD95L, CD153, CD154 (against NGF C07K16/22 , against TNF C07K16/24B)] [N9703] [C9705]
7	C07501628R	Immunoglobulins [IGs], e.g. monoclonal or polyclonal antibodies - against the NGF-receptor/TNF-receptor superfamily, e.g. CD27, CD30, CD40, CD95] [N9702] [C0406]

8	C07K01624B	Immunoglobulins [IGs], e.g. monoclonal or polyclonal antibodies - Tumor Necrosis Factors

IPC class codes

Sr. No.	Class code	Definition
1	C07K14/525	Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof - Tumour necrosis factor (TNF)
2	C12N15/28	Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification; Use of hosts therefor - Tumor necrosis factors

Patent Search Results

- **Click here** to download **updated** relevant patents with legal status, filtering option and hyperlinking.

NOTE: Legal status of the Russian patent applications and publications was retrieved from ROSPATENTS wherever available. Legal Status can also be retrieved from STN - INPADOCDB & RUSSIAPAT databases.

Legal Status coverage -Timeline	
STN- INPADOCDB	1978 to Present
STN- RUSSIAPAT	1994 to Present
Micropat- INPADOC	1920 to Present

- **STN databases price list**

Database	Connect hour	Display Record
STN- INPADOCDB	232 $ per Hour	1.24 $ per Record
STN- RUSSIAPAT	186 $ per Hour	2.28 $ per Record

- **Legal status display format in the STN - INPADOCDB, RUSSIAPAT databases**

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                      20050603
                  EXA Examination, Search Report
20050914 EPAKX      + PAYMENT OF DESIGNATION FEES
                      DE FR GB
20061004 EPAK       + DESIGNATED CONTRACTING STATES:
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                      DE FR GB
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                      200711.................................20070315
20070411 EPREG        REFERENCE TO A NATIONAL CODE
         GB732E       GB: PROCEEDING UNDER SECTION 32 PATENTS ACT 1977
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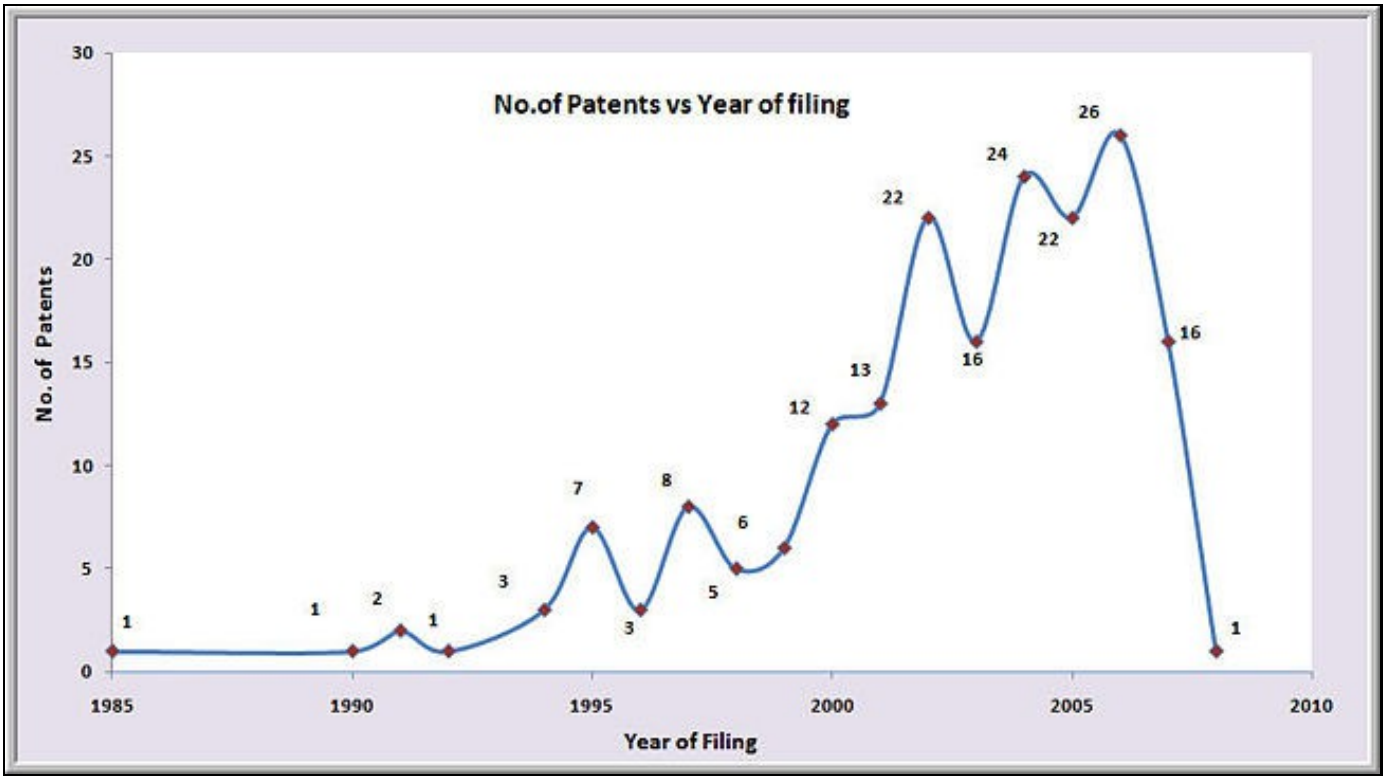
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20041222 EPAX       + EXTENSION OF THE EUROPEAN PATENT TO
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20050803 EP17P      + REQUEST FOR EXAMINATION FILED
                      20050603
                  EXA Examination, Search Report
20050914 EPAKX      + PAYMENT OF DESIGNATION FEES
                      DE FR GB
20061004 EPAK       + DESIGNATED CONTRACTING STATES:
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                      200641
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                      200646
20070314 EPRAP2       PATENT OWNER REASSIGNMENT (CORRECTION)
                      FUJIFILM CORPORATION
                  CHG Change of Owner, Inventor, Applicant
                      200711.................................20070315
20070411 EPREG        REFERENCE TO A NATIONAL CODE
         GB732E       GB: PROCEEDING UNDER SECTION 32 PATENTS ACT 1977
                  CHG Change of Owner, Inventor, Applicant
                      200716.................................20070419
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Legal status display format

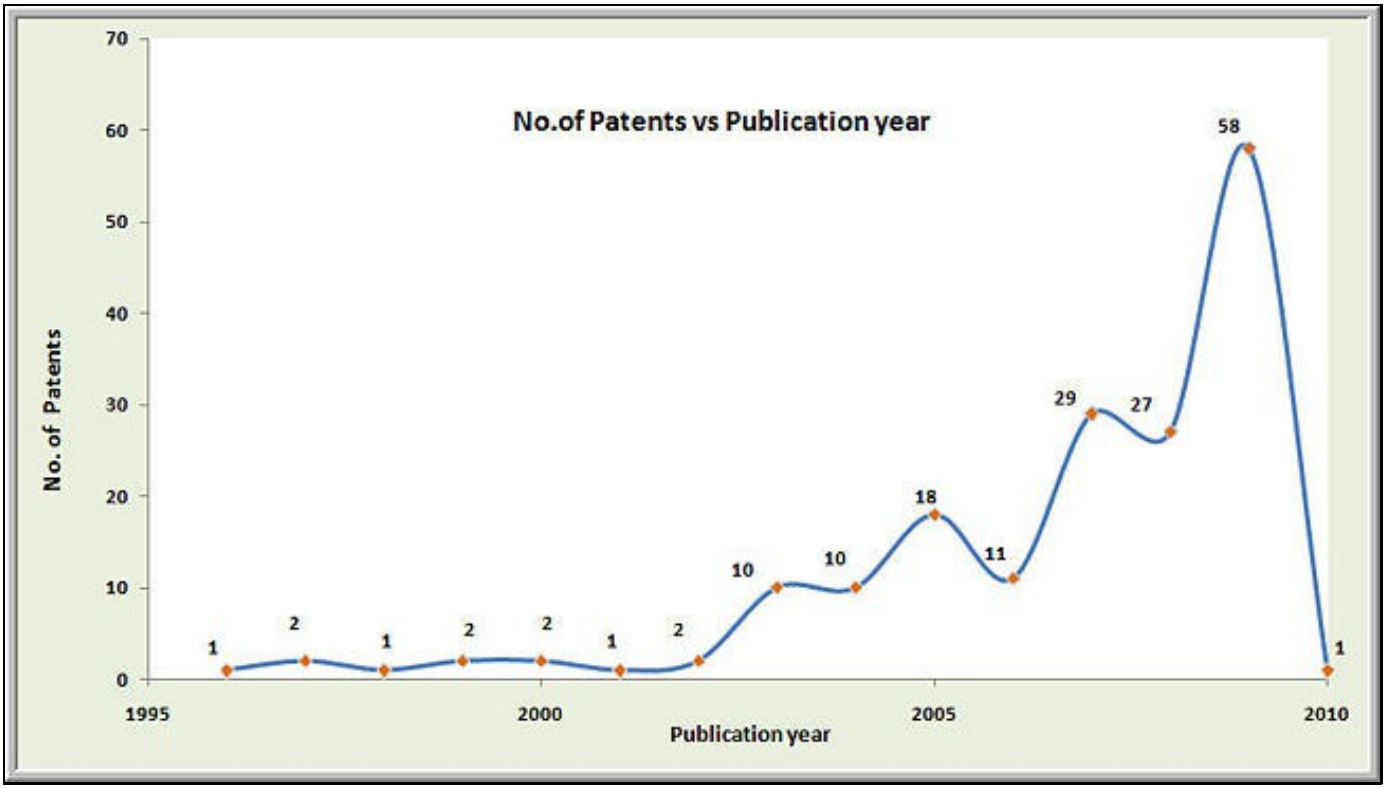
Important charts

Filling year vs number of patents



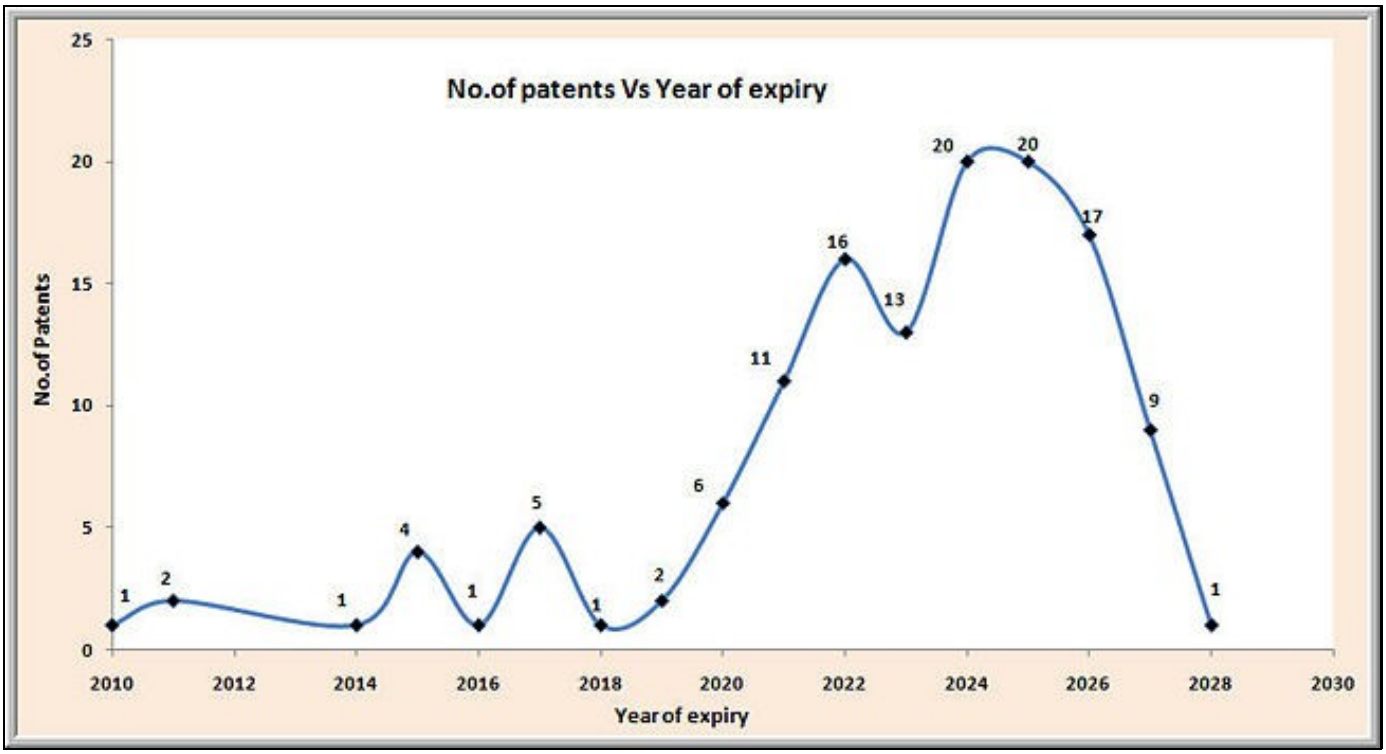
Filling year vs number of patents

Publication year vs number of patents



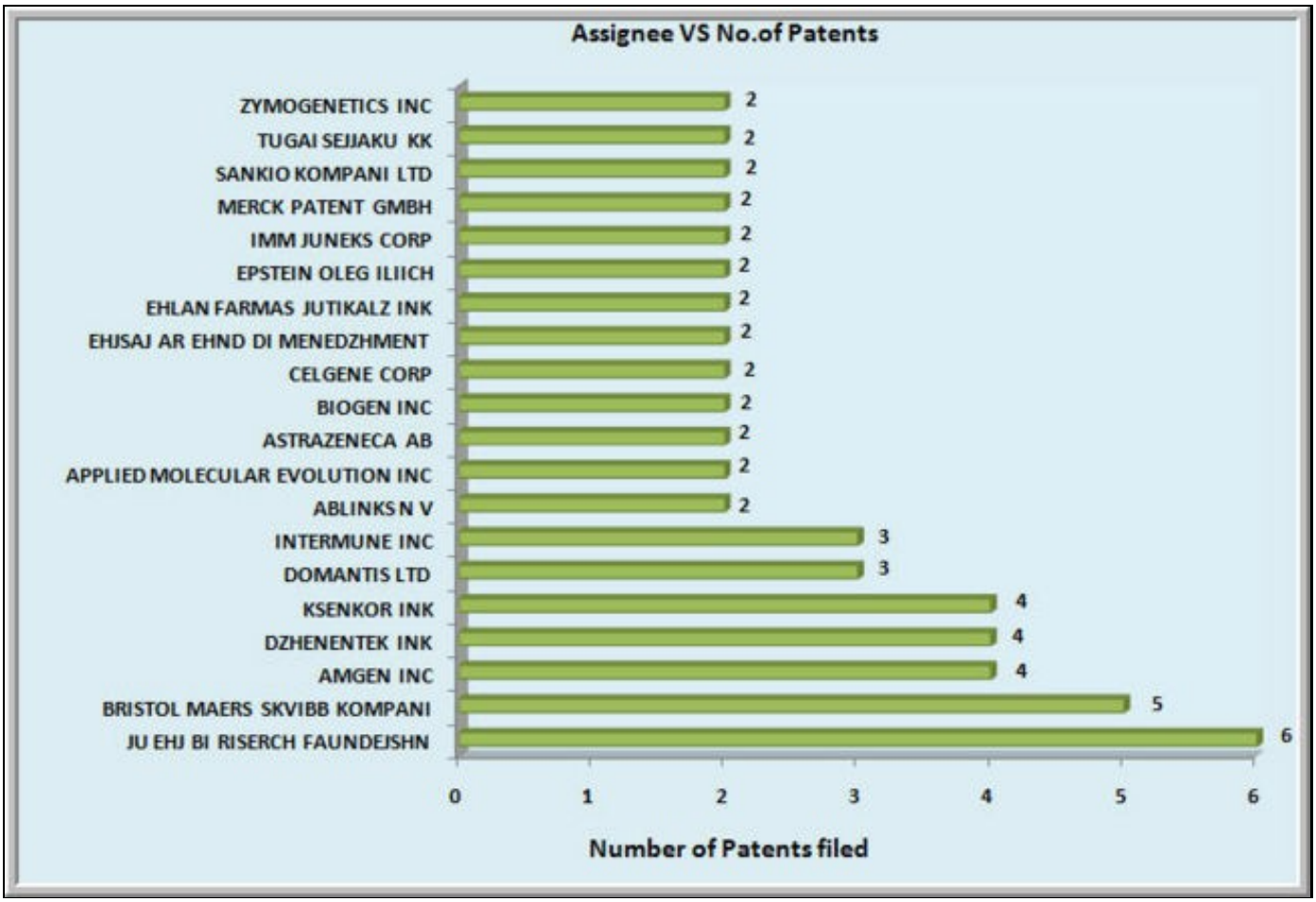
Publication year vs number of patents

Calculated expiry year vs number of patents



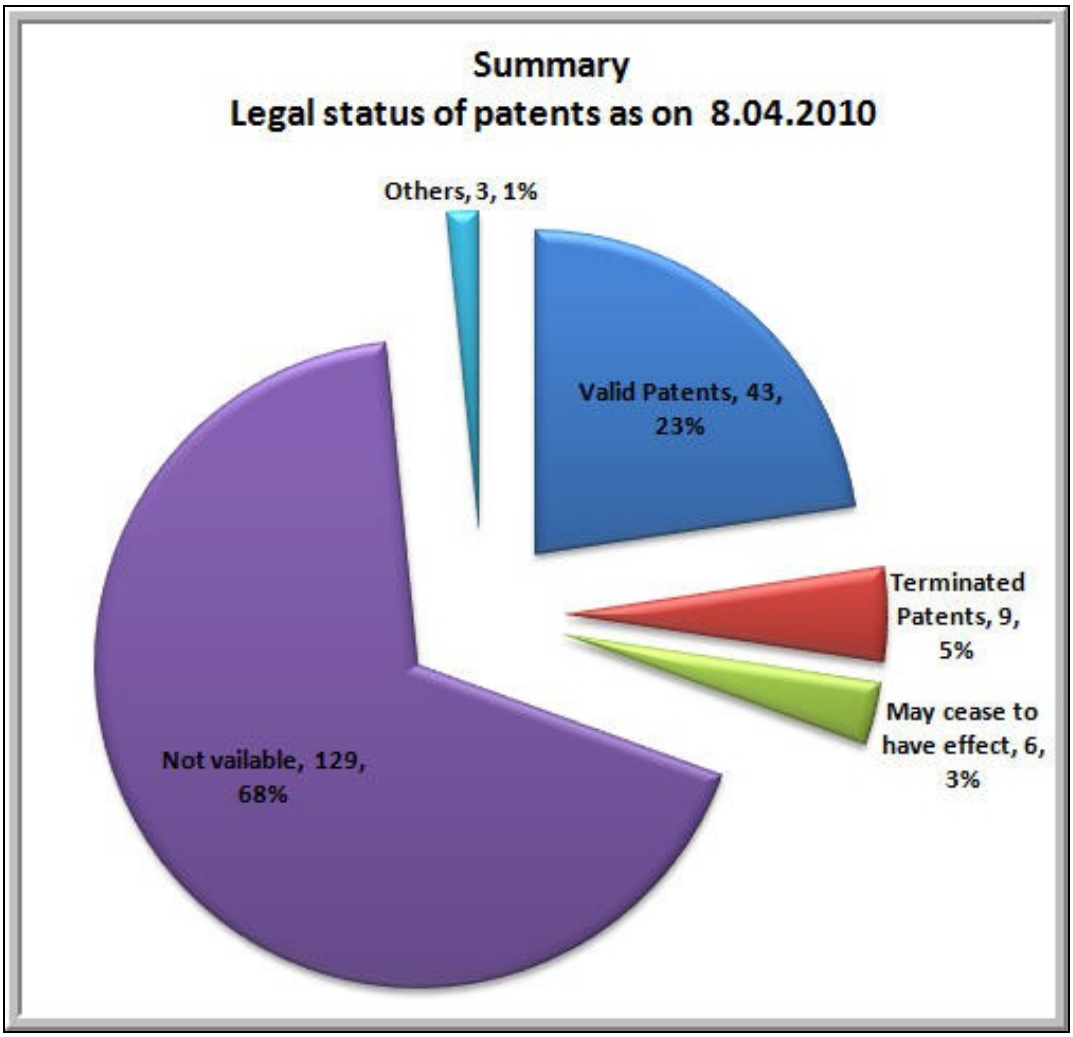
Calculated expiry year vs number of patents

Assignees vs number of patents



Assignees vs number of patents

Summary chart



Summary chart