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Pfenex Inc

CORTELLIS COMPANY DETAILED PIPELINE REPORT

A comprehensive coverage of the the company's drug pipeline portfolio including detailed product records.

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ABOUT CORTELLIS COMPANY DETAILED PIPELINE REPORT

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GLOSSARY

Number of Drugs in Active Development

Number of drugs associated with the company or subsidiary that are currently in active development, i.e. the development status for the drug(s) is one of the following: Discovery, Clinical, Phase I, Phase II, Phase III, Pre-registration, Registered, Launched, or Suspended.

Number of Inactive Drugs

Number of drugs associated with the company or subsidiary that are currently classified as inactive, i.e. where the development status for the drug(s) is one of the following: No Development Reported, Discontinued, or Withdrawn.

Number of Patents as Owner

Number of patents associated with the company where the company is listed as owner; i.e. the relationship type (or way the patent refers to the company) is: Patent Assignee/Owner, Patent owner (not assignee), Licensee for development and marketing, Licensee – marketing only (Distributor), Patent assignee of family member, Inferred assignee.

Number of Patents as Third Party

Number of patents associated with the company where the company is listed as third party; i.e. the relationship type (or way the patent refers to the company) is: Patent assignee (not owner), Ex-Licensee for development and marketing, Ex-Licensee marketing only (Distributor), Customer of technology, Ex-Customer of technology, Patent opponent or infringer, Affiliate organization of inventor, Owner of underlying technology.

Patents summary table

This table represents a summary of the core patent coverage for this company covering Therapeutic EP, US and WO patents since 1990 only.

Number of Deals

A count of deals where the company or one of its subsidiaries is the primary company.

Key Indications

Displays top ten key indications for the company and its subsidiaries based on frequency (indications occurring with high and identical frequency are always included, and this may result in more than ten Key Indications being listed). Includes both indications associated with patents where the company is patent owner and indications associated with drugs in active development. A drug is classified as 'active' if it features on a row (or rows) in the current development status table where the status is one of the following: Discovery, Clinical, Phase I, Phase II, Phase III, Pre-registration, Registered, Launched, or Suspended.

Key Target-based Actions

Displays top ten key target-based actions for the company and its subsidiaries based on frequency (actions occurring with high and identical frequency are always included, and this may result in more than ten Key Target-based Actions being listed). Includes both target-based actions associated with patents where the company patent owner and target-based actions associated with drugs in active development. A drug is classified as 'active' if it features on a row (or rows) in the current development status table where the status is one of the following: Discovery, Clinical, Phase I, Phase II, Phase III, Pre-registration, Registered, Launched, or Suspended. A target-based action is one that is associated with a target.

Key Technologies

Displays top ten key technologies for the company and its subsidiaries based on frequency (technologies occurring with high and identical frequency are always included, and this may result in more than ten Key Technologies being listed). Includes both key technologies associated with patents where the company relationship is patent owner and key technologies associated with drugs in active development. A drug is classified as 'active' if it features on a row (or rows) in the current development status table where the status is one of the following: Discovery, Clinical, Phase I, Phase II, Phase III, Pre-registration, Registered, Launched, or Suspended.

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Pfenex Inc

COMPANY OVERVIEW

Company Name	Pfenex Inc
Parent Company Name	Pfenex Inc
Website	http://www.pfenex.com/
Country	US
Number of Drugs in Active Development	14
Number of Inactive Drugs	4
Number of Patents as Owner	5
Number of Patents as Third Party	0
Number of Deals	17
Key Indications	Neutropenia,Growth hormone deficiency,Bacillus anthracis infection,Hepatitis C virus infection,Multiple sclerosis,Plasmodium falciparum infection,Acute lymphoblastic leukemia,Age related macular degeneration,Inflammatory disease,Plasmodium infection,Unidentified indication
Key Target-based Actions	Interferon beta ligand,GCSF receptor agonist,Growth hormone ligand,GCSF ligand,Interferon alpha 2 ligand,Asparaginase stimulator,GP IIb IIIa antagonist,Interferon alpha 2 ligand modulator,Interferon receptor modulator,TNF alpha ligand inhibitor,TNF antagonist,VEGF-A ligand inhibitor
Key Technologies	Biological therapeutic,Protein recombinant,Parenteral formulation unspecified,Biosimilar product,Injectable formulation,PEGylated formulation,Antibody fragment,Subcutaneous formulation,Antigen,Infusion,Intravenous formulation,Monoclonal antibody

COMPANY PROFILE

SUMMARY

Pfenex Inc, headquartered in San Diego, CA is a leading biotechnology company focused on recombinant protein expression for a broad range of applications including therapeutic proteins, vaccines, research, reagents and biosimilars.

ACQUISITIONS AND SPINOFFS

In April 2013, Pfenex, established an unnamed joint venture with Strides Acrolab subsidiary, Agila Biotech, to develop biosimilar products at Agila's Malaysian manufacturing facility. In July 2014, Strides disclosed that R&D programs for the biosimilar products were on track but further delays were expected in the manufacturing facility setup in Malaysia.

FINANCIAL

In April 2015, the company priced its follow-on public offering of 6 million shares of its common stock at $15.50 per share. Of the 6 million shares being offered, 2,610,000 were being offered by Pfenex and the remaining 3,390,000 shares were being offered by existing stockholders. Pfenex would not receive any proceeds from the shares sold by existing stockholders. The underwriters were granted a 30-day option to buy up to an additional 0.75 million shares of common stock from certain existing stockholders. Later in April 2015, the offering was closed and 6.75 million shares were sold, including 0.75 million shares from full exercise of underwriters' option, raising $38 million in net proceeds. A total of 2,610,000 common shares were sold by Pfenex and 4,140,000 shares were sold by existing stockholders.

In September 2014, the shares began trading on the Russell Microcap and the Russell Global Indices.

In June 2014, Pfenex planned an IPO of common stock; in July 2014, the company priced its IPO of 8,333,333 common stock shares at a price of $6.00 per share to the public and at that time, the underwriters were granted a 30-day option to purchase up to 1,250,000 additional common stock shares at the same price. The shares had begun trading under the symbol "PFNX" on the NYSE MKT; later that month, the offering was closed.

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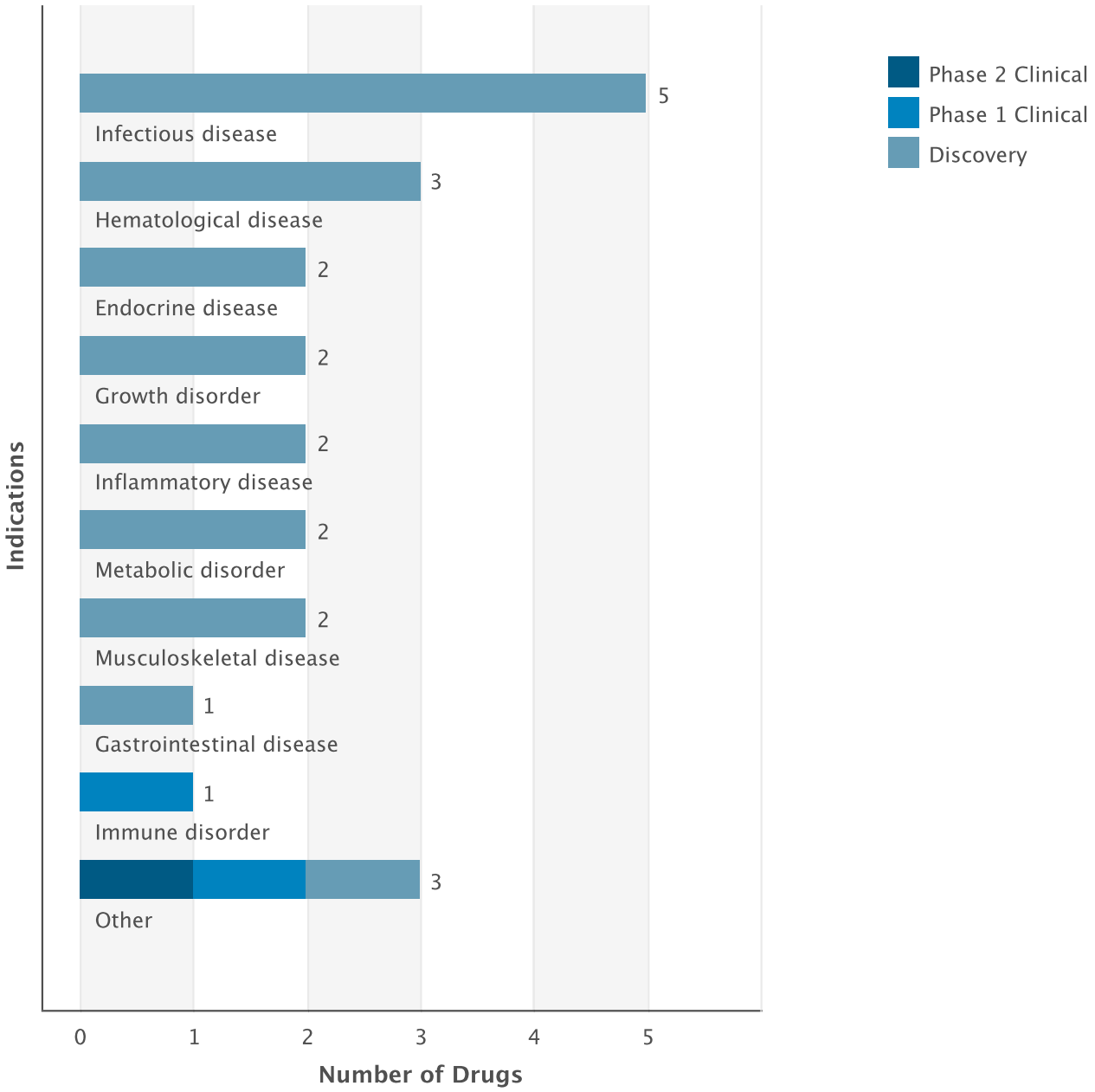
PRODUCT PORTFOLIO SUMMARY

DRUGS

Drugs by Indication

Active Drugs by Indication Chart



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Drugs by Indication Table

Indication	Active	Inactive	Total
Infectious disease	5	1	6
Hematological disease	3	1	4
Inflammatory disease	2	1	3
Neoplasm	1	1	2
Musculoskeletal disease	2	0	2
Metabolic disorder	2	0	2
Growth disorder	2	0	2
Endocrine disease	2	0	2
Neurological disease	1	0	1
Ocular disease	1	0	1
Immune disorder	1	0	1
Gastrointestinal disease	1	0	1
Unidentified indication	1	0	1
Cardiovascular disease	0	1	1
Respiratory disease	0	1	1

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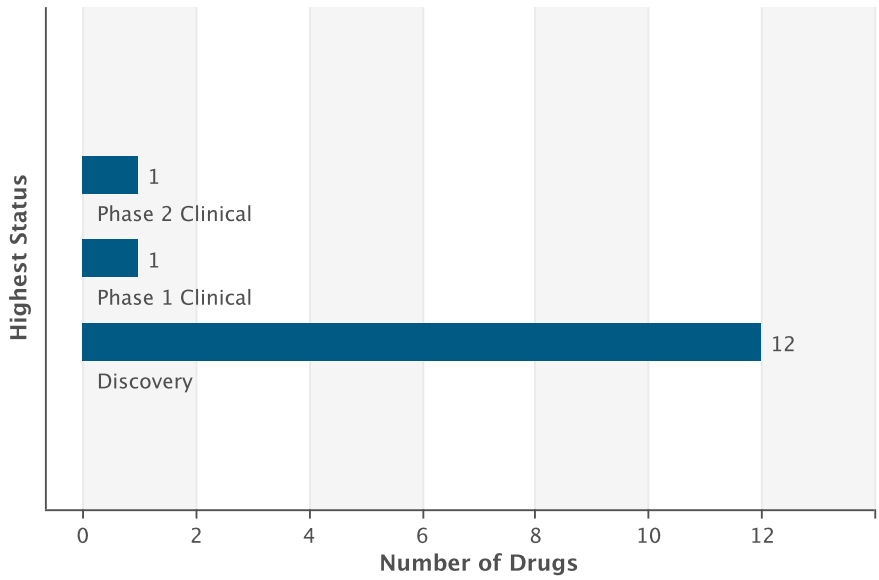
Drugs by Highest Status

Active Drugs by Highest Status Chart



Drugs by Highest Status Table

Development Status	Number of Drugs
Phase 2 Clinical	1
Phase 1 Clinical	1
Discovery	12
No Development Reported	4

DEALS

Deal Type	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Technology - Other Proprietary	7	0	0	0	7
Drug - Funding	4	0	1	0	5
Drug - Development/Commercialization License	1	0	0	0	1
Drug - Manufacturing/Supply	0	0	3	0	3

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CLINICAL TRIALS

Trials by Condition Studied

Condition Studied	Ongoing	All
Ocular disease	1	2

Trials by Phase

Phase	Ongoing	All
Phase 1	2	3

Phase Definitions

Phase 3 Clinical
Includes Phase 3, Phase 3b, Phase 3a, Phase 2/3 (where enrolment count is 300 or over)

Phase 2 Clinical
Includes Phase 2, Phase 2a, Phase 2b, Phase 1/2 (where enrolment count is 100 or over), Phase 2/3 (where enrolment count is under 300 or not specified)

Phase 1 Clinical
Includes Phase 1, Phase 1a, Phase 1, Phase 1/2 (where enrolment count is under 100 or not specified), Phase 0

PATENTS *

Indication	As Owner	As Third Party	Total
Cardiovascular disease	2	0	2
Endocrine disease	6	0	6
Gastrointestinal disease	4	0	4
Growth disorder	2	0	2
Hematological disease	2	0	2
Immune disorder	5	0	5
Musculoskeletal disease	1	0	1
Neoplasm	8	0	8
Genetic disorder	1	0	1
Metabolic disorder	3	0	3
Neurological disease	4	0	4
Respiratory disease	3	0	3
Infectious disease	13	0	13
Unidentified indication	2	0	2

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Inflammatory disease	4	0	4
Gynecology and obstetrics	1	0	1
Dermatological disease	2	0	2

* This table represents a summary of the core patent coverage for this company covering Therapeutic EP, US and WO patents since 1990 only.

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PRODUCT PORTFOLIO DRUG PIPELINE DETAIL

PLEASE NOTE: Highest status refers to highest development of that drug for one of the active companies

PF-582

PF-582 SNAPSHOT

Drug Name	PF-582
Key Synonyms	ranibizumab
Originator Company	Pfenex Inc
Active Companies	Hospira Inc;Pfenex Inc
Inactive Companies	
Highest Status	Phase 2 Clinical
Active Indications	Age related macular degeneration
Target-based Actions	VEGF-A ligand inhibitor
Other Actions	Ocular antineovascularisation agent;Angiogenesis inhibitor
Technologies	Biosimilar product;Injectable formulation;Ophthalmic formulation;Biological therapeutic;Parenteral formulation unspecified;Protein recombinant;Monoclonal antibody humanized;Antibody fragment
Last Change Date	17-Mar-2015

PF-582 DEVELOPMENT PROFILE

SUMMARY

Pfenex, in collaboration with Hospira, is developing PF-582, a biosimilar version of humanized anti-VEGF-A mAb fragment ranibizumab, as an injectable formulation, for the potential treatment of age-related macular degeneration (AMD). In November 2013, a phase Ib/IIa study in AMD was initiated. In August 2014, a phase III trial was planned for mid-2015 ; in March 2015, phase III trial was expected to begin in 2016. In February 2013, the company was seeking to outlicense the biosimilar in Western markets.

PF-582 DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Age related macular degeneration	New Zealand	Phase 2 Clinical	30-Nov-2013
Hospira Inc	Age related macular degeneration	US	Discovery	10-Feb-2015
Pfenex Inc	Age related macular degeneration	US	Discovery	21-Jun-2012

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PF-582 DRUG NAMES

Names	Type
ranibizumab	INN, USAN
PF-582	Research Code
ranibizumab biosimilar (age related macular degeneration), Pfenex	
ranibizumab biosimilar, Pfenex	

PF-582 CLINICAL TRIALS

Trials by Phase and Condition Studied

Phase 4 Clinical		Phase 3 Clinical		Phase 2 Clinical		Phase 1 Clinical		Phase Unspecified		Total	
On-going	All	On-going	All	On-going	All	On-going	All	On-going	All	On-going	All
Age related macular degeneration											
0	0	0	0	0	0	1	2	0	0	1	2

Total Trials by Phase and Status

Phase 4 Clinical		Phase 3 Clinical		Phase 2 Clinical		Phase 1 Clinical		Phase Unspecified		Total	
On-going	All	On-going	All	On-going	All	On-going	All	On-going	All	On-going	All
Total by Phase and Status											
0	0	0	0	0	0	1	2	0	0	1	2

Phase Definitions

Phase 3 Clinical
Includes Phase 3, Phase 3b, Phase 3a, Phase 2/3 (where enrolment count is 300 or over)

Phase 2 Clinical
Includes Phase 2, Phase 2a, Phase 2b, Phase 1/2 (where enrolment count is 100 or over), Phase 2/3 (where enrolment count is under 300 or not specified)

Phase 1 Clinical
Includes Phase 1, Phase 1a, Phase 1, Phase 1/2 (where enrolment count is under 100 or not specified), Phase 0

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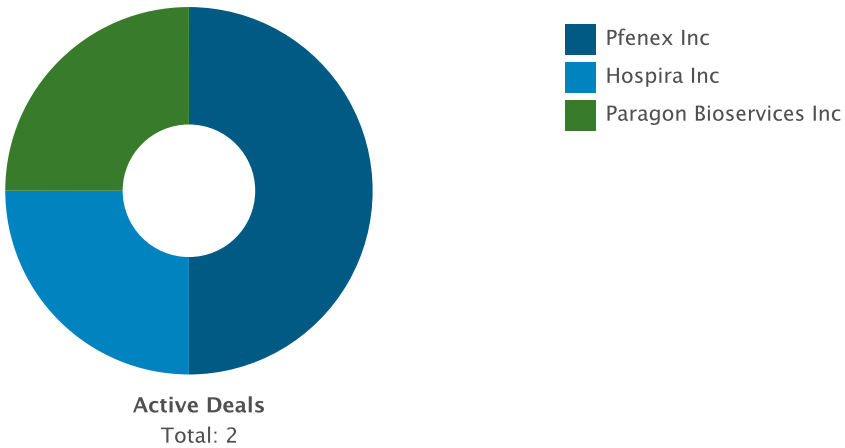
PF-582 DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Pfenex Inc	1	0	1	0	2
Hospira Inc	0	0	1	0	1
Paragon Bioservices Inc	1	0	0	0	1

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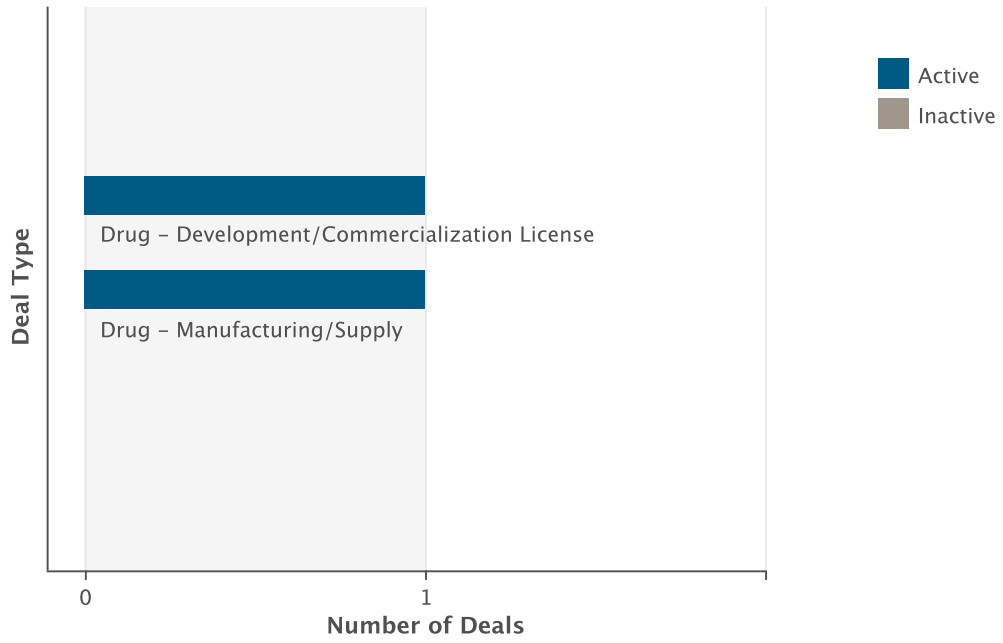
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Drug - Development/Commercialization License	1	0	1
Drug - Manufacturing/Supply	1	0	1

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interferon beta-1b biosimilar, Pfenex

interferon beta-1b biosimilar, Pfenex SNAPSHOT

Drug Name	interferon beta-1b biosimilar, Pfenex
Key Synonyms	interferon beta-1b
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc
Inactive Companies	Pfenex/Stelis Joint Venture
Highest Status	Phase 1 Clinical
Active Indications	Multiple sclerosis
Target-based Actions	Interferon receptor modulator;Interferon beta ligand
Other Actions	Immunomodulator
Technologies	Biosimilar product;Biological therapeutic;Subcutaneous formulation;Protein recombinant
Last Change Date	20-May-2015

interferon beta-1b biosimilar, Pfenex DEVELOPMENT PROFILE

SUMMARY

Pfenex (following the removal of program from Joint Development and License Agreement) is developing PF-530, a biosimilar version of Betaseron, an IFN beta-1b, for the potential treatment of multiple sclerosis,,. By March 2015, a phase I trial had been initiated. In April 2015, a phase I trial was initiated in Australia. At that time, last patient enrollment was expected in September 2015.

Pfenex/Stelis (following Agila's name change), an unnamed joint venture created by Pfenex and Stelis (formerly Agila Biotech (Agila Specialties)), was previously investigating PF-530, for the potential treatment of multiple sclerosis,. However, in March 2015, the program was removed from the Joint Development and License Agreement.

interferon beta-1b biosimilar, Pfenex DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Multiple sclerosis	Australia	Phase 1 Clinical	14-Apr-2015
Pfenex Inc	Multiple sclerosis	US	Phase 1 Clinical	31-Mar-2015
Pfenex/Stelis Joint Venture	Multiple sclerosis	Malaysia	Discontinued	16-Mar-2015

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interferon beta-1b biosimilar, Pfenex DRUG NAMES

Names	Type
interferon beta-1b biosimilar, Pfenex	
interferon beta-1b biosimilar, Pfenex/Stelis Joint Venture	
interferon beta-1b	BANN, INN, USAN
interferon beta-1b biosimilar, Pfenex/Agila Joint Venture	
PF-530	Research Code

interferon beta-1b biosimilar, Pfenex CLINICAL TRIALS

Total Trials by Phase and Status

Phase 4 Clinical		Phase 3 Clinical		Phase 2 Clinical		Phase 1 Clinical		Phase Unspecified		Total	
On-going	All	On-going	All	On-going	All	On-going	All	On-going	All	On-going	All
Total by Phase and Status											
0	0	0	0	0	0	1	1	0	0	1	1

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Px-533

Px-533 SNAPSHOT

Drug Name	Px-533
Key Synonyms	
Originator Company	Pfenex Inc
Active Companies	National Institutes of Health;Science Applications International Corp;Pfenex Inc
Inactive Companies	
Highest Status	Discovery
Active Indications	Plasmodium falciparum infection
Target-based Actions	
Other Actions	Antiparasitic;Protein subunit vaccine
Technologies	Injectable formulation;Biological therapeutic;Parenteral formulation unspecified;Peptide
Last Change Date	17-Mar-2015

Px-533 DEVELOPMENT PROFILE

SUMMARY

Pfenex in collaboration with NIH and SAIC is investigating Px-533, a Plasmodium falciparum antigen vaccine comprising recombinant circumsporozoite protein (CSP) antigens, using Pfenex's Expression technology which is a Pseudomonas fluorescens-based platform technology, as an injectable formulation, for the potential prevention or treatment of malaria,. In November 2011, the vaccine was listed as being in the preclinical development. By November 2013, preclinical studies had been completed. In March 2015, phase I trial was expected to begin in 2015. In November 2013, the company was seeking to outlicense the vaccine.

Px-533 DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
National Institutes of Health	Plasmodium falciparum infection	US	Discovery	26-Jan-2011
Pfenex Inc	Plasmodium falciparum infection	US	Discovery	26-Jan-2011
Science Applications International Corp	Plasmodium falciparum infection	US	Discovery	26-Jan-2011

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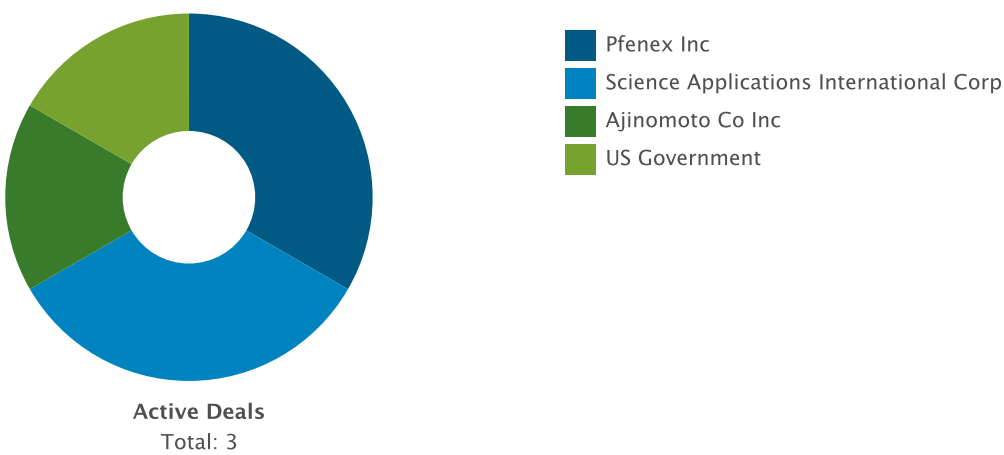
Px-533 DRUG NAMES

Names	Type
Plasmodium falciparum antigen vaccine (malaria), Pfenex/SAIC	
recombinant circumsporozoite protein antigen vaccine (malaria), Pfenex/SAIC	
Plasmodium falciparum antigen (circumsporozoite protein, malaria), Pfenex	
Px-533	Research Code

Px-533 DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Science Applications International Corp	1	0	1	0	2
Pfenex Inc	1	0	1	0	2
US Government	0	0	1	0	1
Ajinomoto Co Inc	1	0	0	0	1

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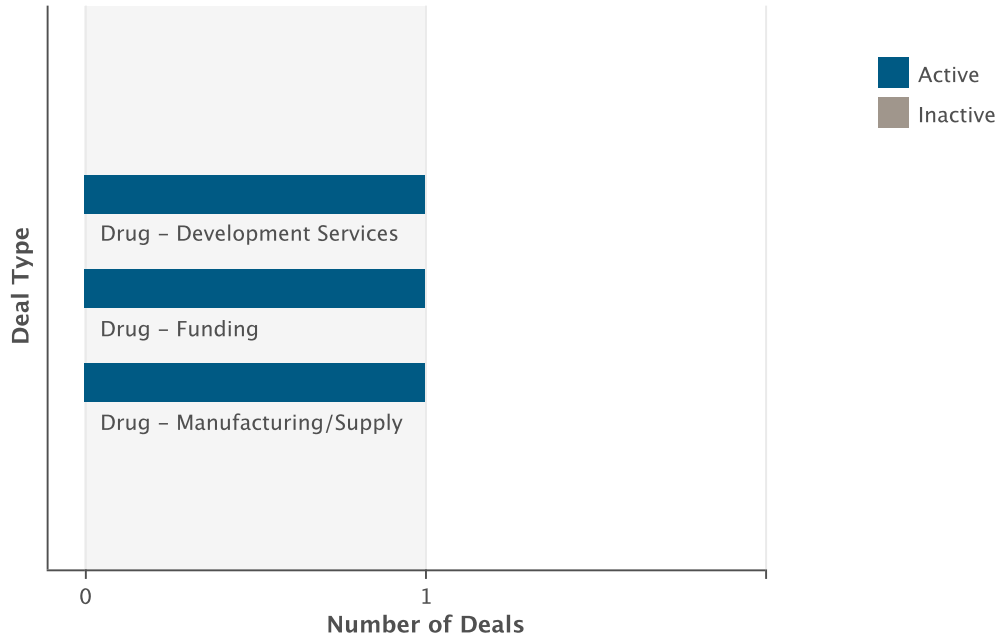
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Drug - Manufacturing/Supply	1	0	1
Drug - Funding	1	0	1
Drug - Development Services	1	0	1

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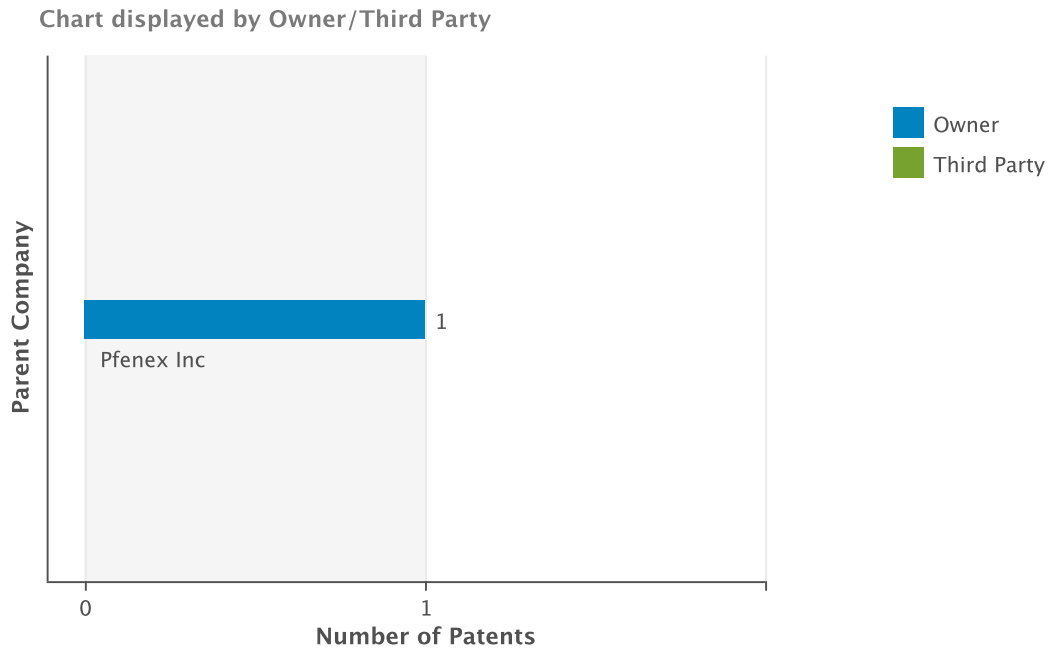
PATENTS

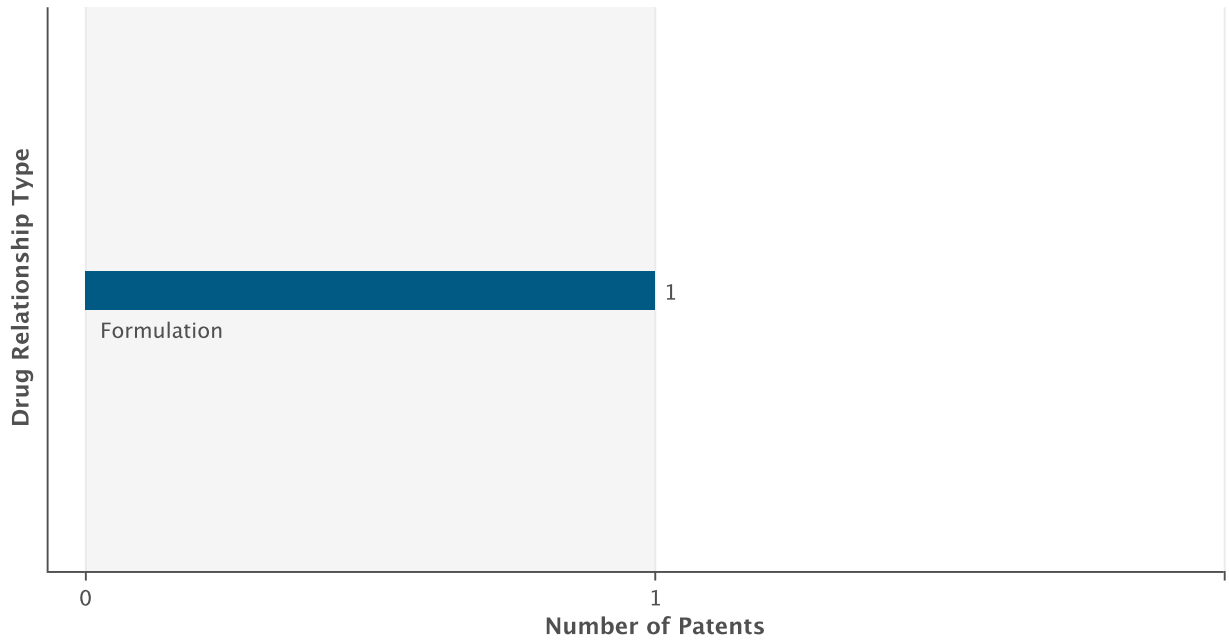
Patents by Parent Company Chart



Patents by Parent Company Table

Company Name	As Owner	As Third Party	Total
Pfenex Inc	1	0	1

Patents by Drug Relationship Type Chart



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Patents by Drug Relationship Type Table

Drug Relationship	Total
Formulation	1

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GCSF biosimilar, Pfenex/Sun

GCSF biosimilar, Pfenex/Sun SNAPSHOT

Drug Name	GCSF biosimilar, Pfenex/Sun
Key Synonyms	
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc;Sun Pharmaceutical Industries Ltd
Inactive Companies	Ranbaxy Laboratories Ltd
Highest Status	Discovery
Active Indications	Neutropenia
Target-based Actions	GCSF ligand;GCSF receptor agonist
Other Actions	Hematopoietic stimulant;Neutrophil stimulator
Technologies	Biosimilar product;Biological therapeutic;Subcutaneous formulation;Intravenous formulation;Infusion;Protein recombinant
Last Change Date	26-Mar-2015

GCSF biosimilar, Pfenex/Sun DEVELOPMENT PROFILE

SUMMARY

Pfenex, presumed to be in collaboration with Sun Pharmaceutical Industries following Sun's acquisition of Ranbaxyis investigating a biosimilar version of a recombinant methionyl, non-glycosylated form GCSF, for the potential treatment of neutropenia. In June 2012, the biosimilar was in preclinical development; in September 2013, development was ongoing. In July 2012, Pfenex was seeking to outlicense the biosimilar.

GCSF biosimilar, Pfenex/Sun DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Neutropenia	US	Discovery	29-Mar-2010
Sun Pharmaceutical Industries Ltd	Neutropenia	India	Discovery	25-Mar-2015

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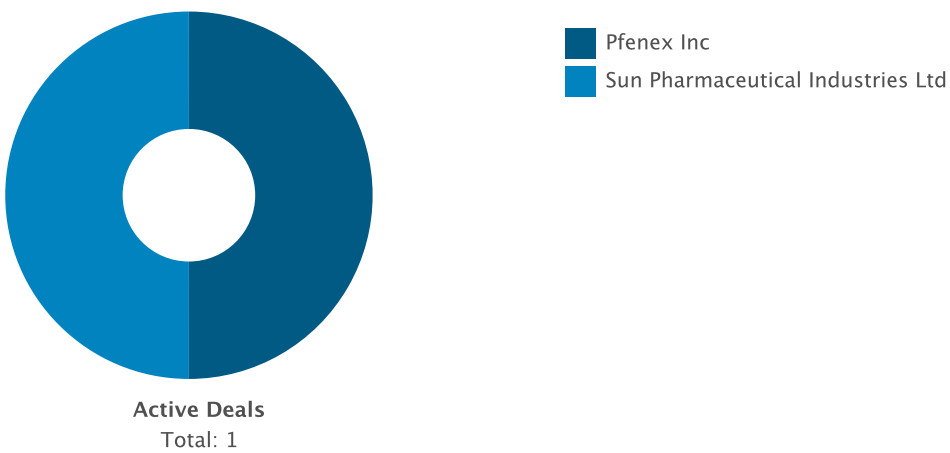
GCSF biosimilar, Pfenex/Sun DRUG NAMES

Names	Type
G-CSF	
GCSF biosimilar, Pfenex/Sun	
granulocyte colony-stimulating factor	
GCSF biosimilar, Pfenex/Ranbaxy	

GCSF biosimilar, Pfenex/Sun DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Sun Pharmaceutical Industries Ltd	0	0	1	0	1
Pfenex Inc	1	0	0	0	1

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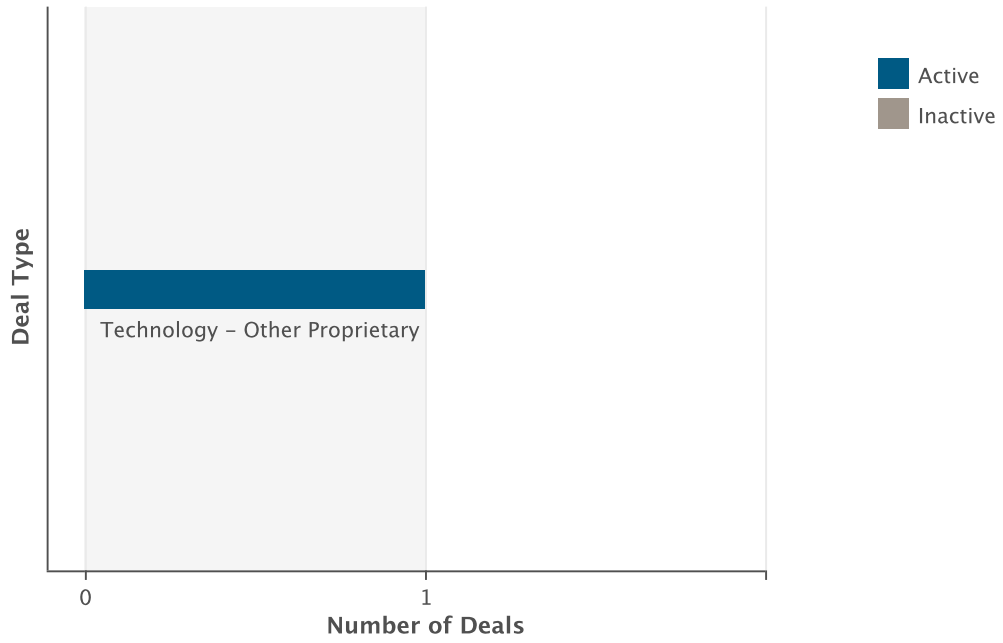
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Technology - Other Proprietary	1	0	1

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Px-563L

Px-563L SNAPSHOT

Drug Name	Px-563L
Key Synonyms	
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc;US Health and Human Services Department
Inactive Companies	
Highest Status	Discovery
Active Indications	Bacillus anthracis infection
Target-based Actions	
Other Actions	Antibacterial;Recombinant bacterial vector vaccine
Technologies	Injectable formulation;Biological therapeutic;Parenteral formulation unspecified;Quick release formulation;Antigen
Last Change Date	30-Jun-2015

Px-563L DEVELOPMENT PROFILE

SUMMARY

Pfenex, in collaboration with BARDA, is investigating Px-563L, a stable, fast acting, dose sparing vaccine containing an anthrax antigen, mutant recombinant protective antigen (mrPA)formulated in Immunovaccine's DepoVax liposome delivery platform, as a single dose vaccine, using Pfenex's Expression technology, which is a Pseudomonas fluorescens-based platform technology, as an injectable formulation, for the potential prevention or treatment of anthrax infection,,. In September 2013, the vaccine was listed as being in preclinical development. In April 2014, positive data were reported. In December 2014, an IND was filed ; in March 2015, a phase I trial was expected to begin in 2015 ; in May 2015, the trial was expected to begin in the second half of 2015.

Pfenex is also investigating Px-563L SDI, a solid dose formulation of Px-563L.

Px-563L DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Bacillus anthracis infection	US	Discovery	03-Aug-2010
US Health and Human Services Department	Bacillus anthracis infection	US	Discovery	03-Aug-2010

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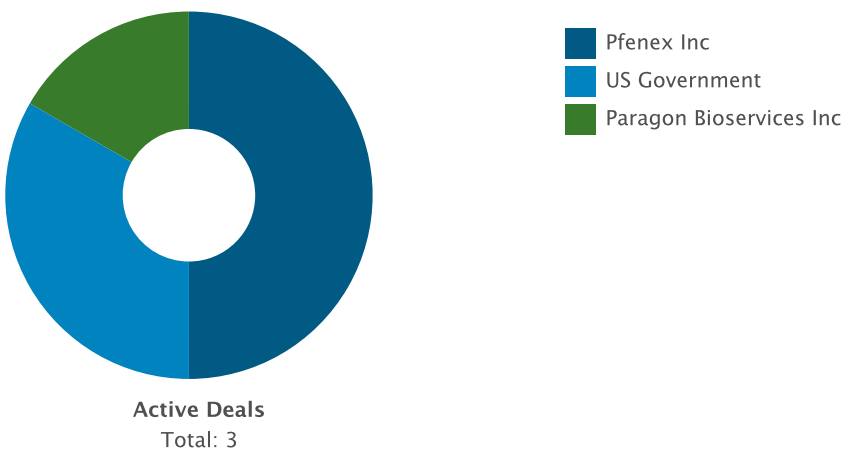
Px-563L DRUG NAMES

Names	Type
mrPA vaccine (DepoVax, anthrax), Pfenex	
recombinant protective antigen vaccine (anthrax infection), Pfenex/BARDA	
Px-563L	Research Code
rPA vaccine (anthrax), Pfenex/BARDA	

Px-563L DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Pfenex Inc	2	0	1	0	3
US Government	0	0	2	0	2
Paragon Bioservices Inc	1	0	0	0	1

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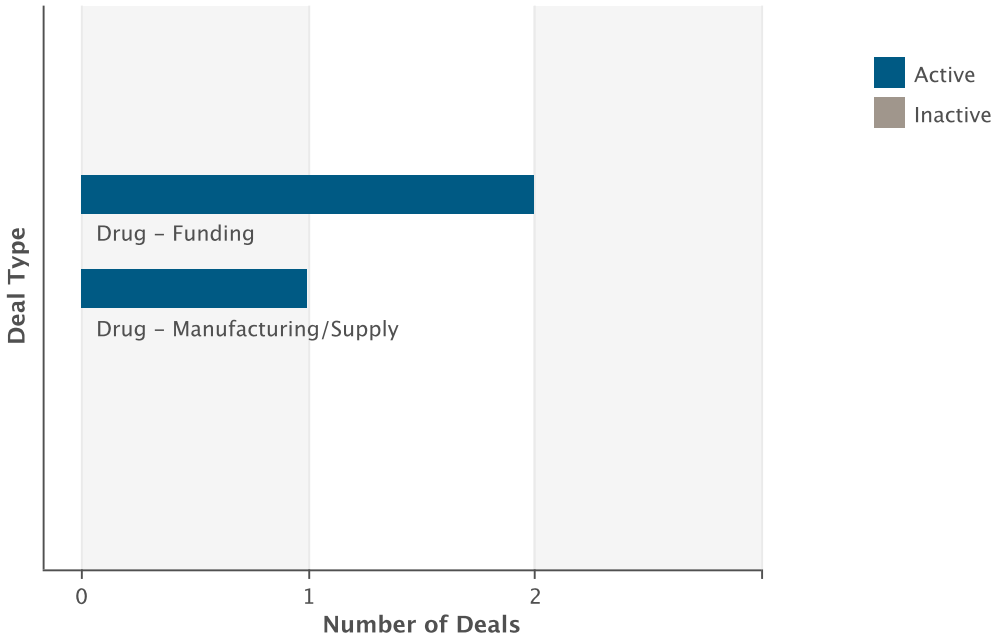
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Drug - Funding	2	0	2
Drug - Manufacturing/Supply	1	0	1

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somatropin biosimilar, Pfenex/Sun

somatropin biosimilar, Pfenex/Sun SNAPSHOT

Drug Name	somatropin biosimilar, Pfenex/Sun
Key Synonyms	somatropin
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc;Sun Pharmaceutical Industries Ltd
Inactive Companies	Ranbaxy Laboratories Ltd
Highest Status	Discovery
Active Indications	Growth hormone deficiency
Target-based Actions	Growth hormone ligand
Other Actions	
Technologies	Biosimilar product;Biological therapeutic;Parenteral formulation unspecified;Protein recombinant
Last Change Date	26-Mar-2015

somatropin biosimilar, Pfenex/Sun DEVELOPMENT PROFILE

SUMMARY

Pfenex, presumed to be in collaboration with Sun Pharmaceutical Industries following Sun's acquisition of Ranbaxy is investigating a biosimilar version of the human growth hormone (HGH) ligand somatropin, presumably for the potential treatment of growth disorder. In September 2013, development was ongoing. In July 2012, the company was seeking to outlicense the biosimilar.

somatropin biosimilar, Pfenex/Sun DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Growth hormone deficiency	US	Discovery	29-Mar-2010
Sun Pharmaceutical Industries Ltd	Growth hormone deficiency	India	Discovery	25-Mar-2015

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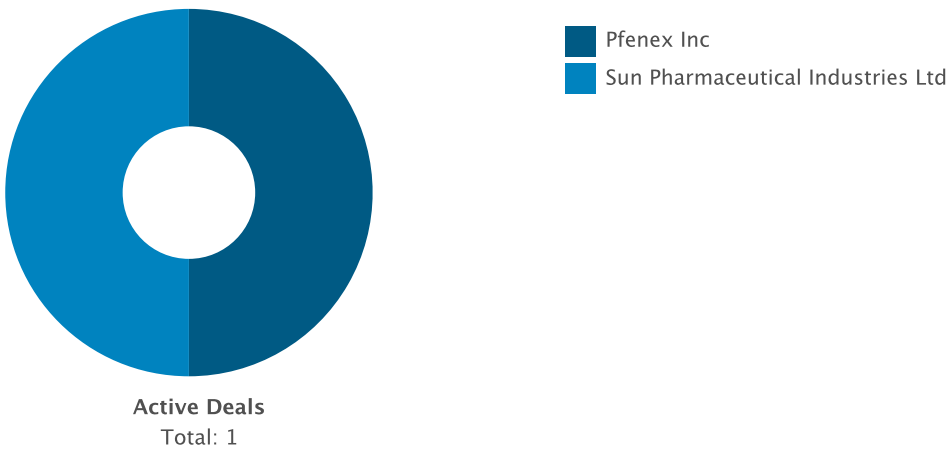
somatropin biosimilar, Pfenex/Sun DRUG NAMES

Names	Type
somatropin biosimilar, Pfenex/Sun	
somatropin biosimilar, Pfenex/Ranbaxy	
somatropin	BAN, INN, USAN
human growth hormone biosimilar, Pfenex/Sun	
human growth hormone biosimilar, Pfenex/Ranbaxy	

somatropin biosimilar, Pfenex/Sun DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Pfenex Inc	1	0	0	0	1
Sun Pharmaceutical Industries Ltd	0	0	1	0	1

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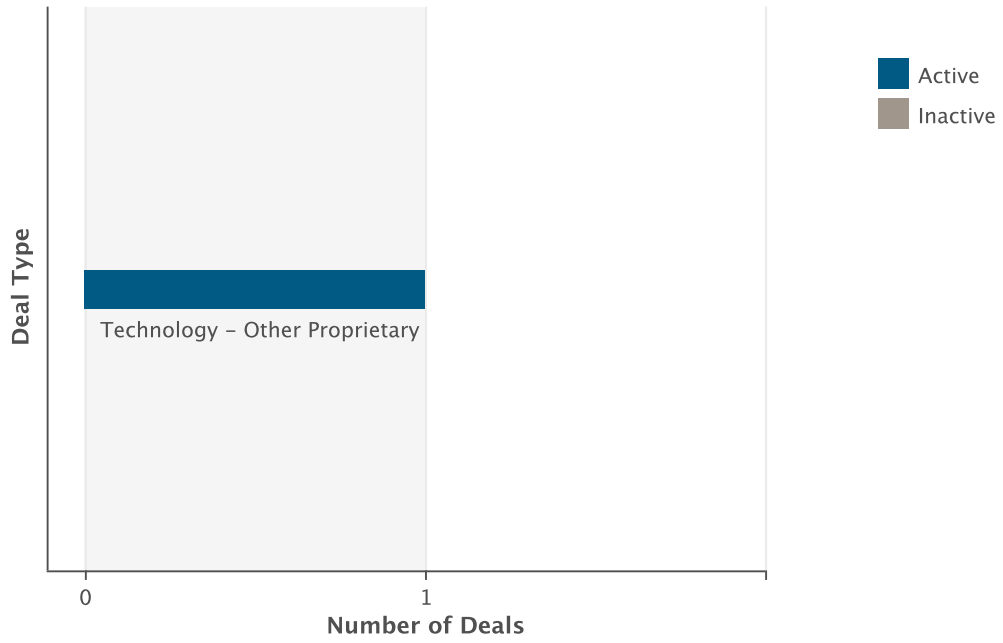
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Technology - Other Proprietary	1	0	1

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pegfilgrastim biosimilar, Pfenex

pegfilgrastim biosimilar, Pfenex SNAPSHOT

Drug Name	pegfilgrastim biosimilar, Pfenex
Key Synonyms	pegfilgrastim
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc
Inactive Companies	Pfenex/Stelis Joint Venture
Highest Status	Discovery
Active Indications	Neutropenia
Target-based Actions	GCSF receptor agonist
Other Actions	Neutrophil stimulator;Hematopoietic stimulant
Technologies	Biosimilar product;PEGylated formulation;Biological therapeutic;Subcutaneous formulation;Protein recombinant
Last Change Date	17-Mar-2015

pegfilgrastim biosimilar, Pfenex DEVELOPMENT PROFILE

SUMMARY

Pfenex (following the removal of program from Joint Development and License Agreement) is investigating PF-529, a biosimilar version of pegfilgrastim, a PEGylated GM-CSF ligand, for the potential treatment of neutropenia,,. In June 2012, the biosimilar was in preclinical development. In March 2015, development was ongoing. In June 2012, Pfenex was seeking to outlicense the biosimilar.

Pfenex/Stelis Joint Venture, an unnamed joint venture created by Pfenex and Stelis, was previously investigating a biosimilar version of pegfilgrastim, a PEGylated GM-CSF ligand, for the potential treatment of neutropenia,. However, in March 2015, the program was removed from the Joint Development and License Agreement.

pegfilgrastim biosimilar, Pfenex DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Neutropenia	US	Discovery	29-Mar-2010
Pfenex/Stelis Joint Venture	Neutropenia	Malaysia	Discontinued	16-Mar-2015

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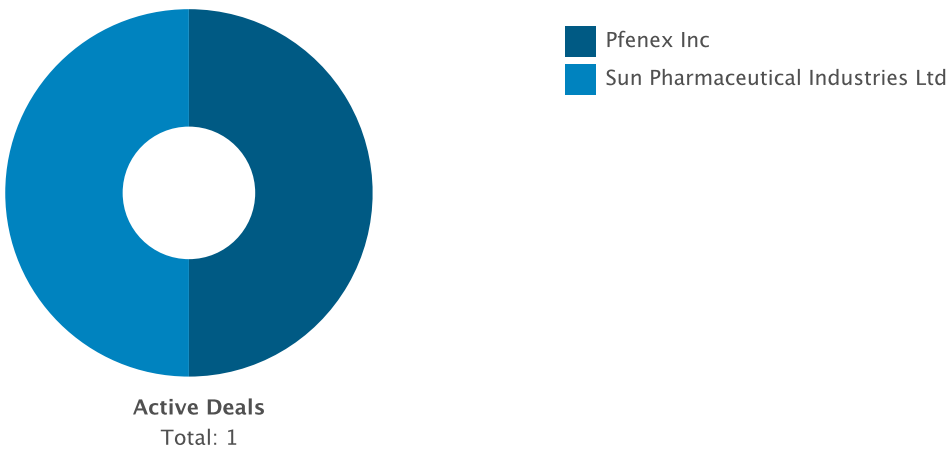
pegfilgrastim biosimilar, Pfenex DRUG NAMES

Names	Type
pegfilgrastim biosimilar, Pfenex	
pegfilgrastim	BANN, INN, USAN
PF-529	Research Code

pegfilgrastim biosimilar, Pfenex DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Sun Pharmaceutical Industries Ltd	0	0	1	0	1
Pfenex Inc	1	0	0	0	1

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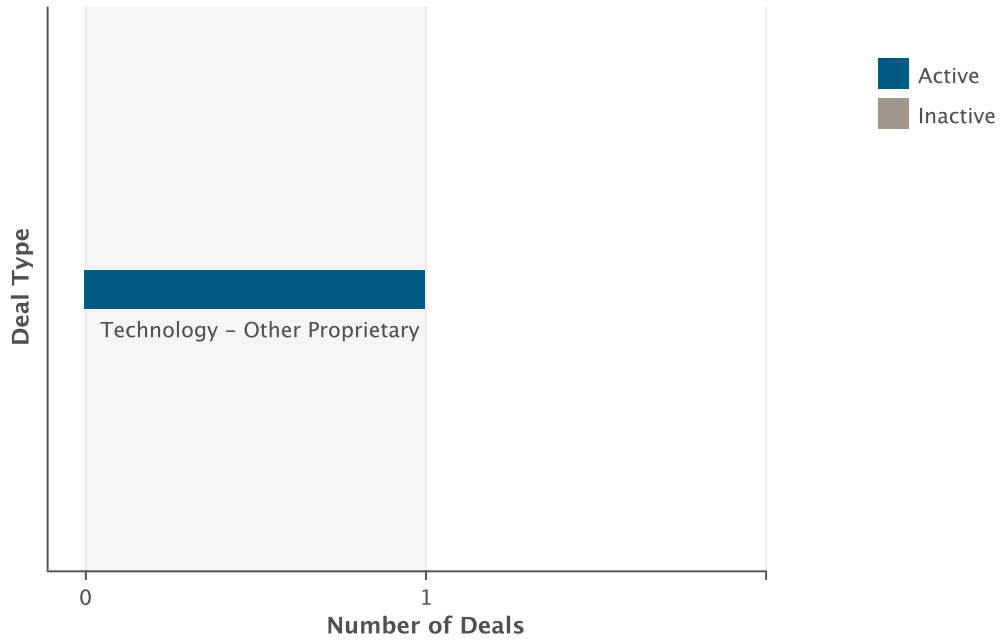
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Technology - Other Proprietary	1	0	1

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Px-563L SDI

Px-563L SDI SNAPSHOT

Drug Name	Px-563L SDI
Key Synonyms	
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc;Glide Pharmaceutical Technologies Ltd
Inactive Companies	
Highest Status	Discovery
Active Indications	Bacillus anthracis infection
Target-based Actions	
Other Actions	Recombinant bacterial vector vaccine;Antibacterial
Technologies	Injectable controlled release formulation;Biological therapeutic;Parenteral formulation unspecified;Formulation solid;Antigen
Last Change Date	30-Jun-2015

Px-563L SDI DEVELOPMENT PROFILE

SUMMARY

Pfenex and Glide Pharma are investigating Px-563L SDI, a solid dose formulation of Pfenex's recombinant protective antigen (rPA) vaccine, a second generation rPA based vaccine, using Pfenex's Expression technology (a Pseudomonas fluorescence-based platform technology) and Glide's Glide SDI solid dose injector technology, for the potential prevention or treatment of anthrax infection,. By March 2015, "encouraging" stability data had been observed with initial formulations of the vaccine.

Px-563L SDI DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Glide Pharmaceutical Technologies Ltd	Bacillus anthracis infection	UK	Discovery	30-Apr-2013
Pfenex Inc	Bacillus anthracis infection	US	Discovery	30-Apr-2013

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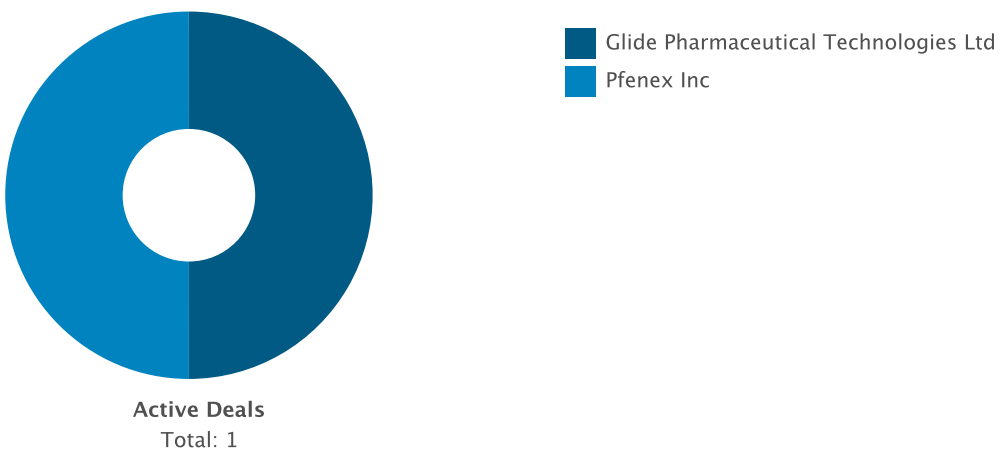
Px-563L SDI DRUG NAMES

Names	Type
recombinant protective antigen vaccine (solid, anthrax infection), Pfenex / Glide	
rPA vaccine (solid, anthrax), Pfenex / Glide	
rPA vaccine (solid-dose injectable/ Glide SDI, anthrax), Pfenex / Glide	
Px-563L SDI	Research Code

Px-563L SDI DEALS AND PATENTS

DEALS

Deals by Parent Company Chart



Deals by Parent Company Table

Company Name	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Pfenex Inc	0	0	1	0	1
Glide Pharmaceutical Technologies Ltd	1	0	0	0	1

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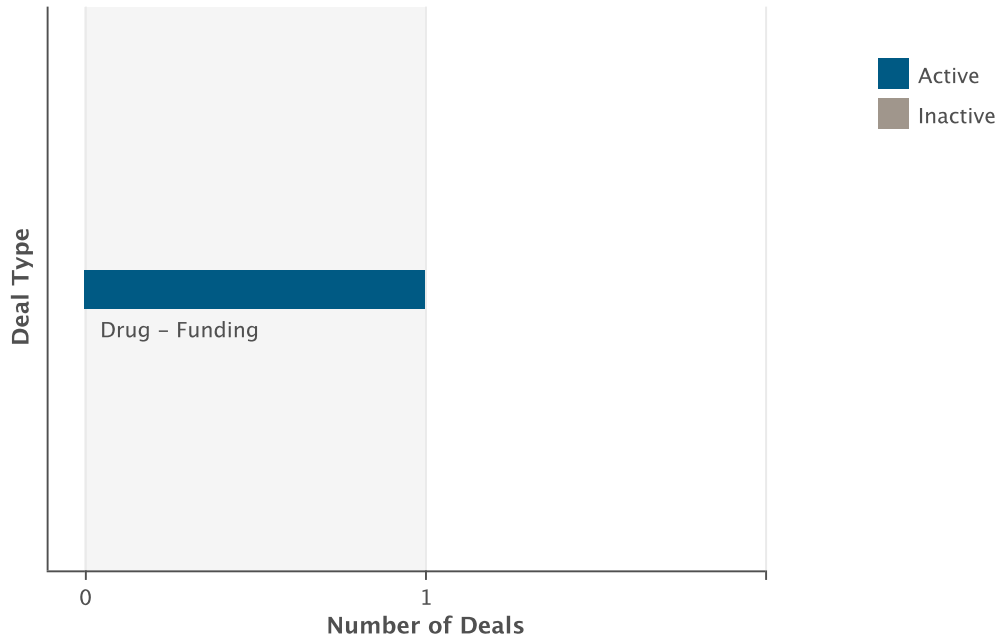
Deals by Type Chart



Deals by Type Table

Deal Type	Active	Inactive	Total
Drug - Funding	1	0	1

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PF-688

PF-688 SNAPSHOT

Drug Name	PF-688
Key Synonyms	certolizumab pegol
Originator Company	Pfenex Inc
Active Companies	Pfenex Inc
Inactive Companies	
Highest Status	Discovery
Active Indications	Inflammatory disease
Target-based Actions	TNF antagonist;TNF alpha ligand inhibitor
Other Actions	Anti-inflammatory;TNF binding agent
Technologies	Biosimilar product;Injectable formulation;PEGylated formulation;Biological therapeutic;Parenteral formulation unspecified;Protein recombinant;Monoclonal antibody humanized;Antibody fragment
Last Change Date	18-Jun-2015

PF-688 DEVELOPMENT PROFILE

SUMMARY

Pfenex is investigating PF-688, a biosimilar version of certolizumab pegol, an anti-TNF-alpha humanized monoclonal antibody fragment, as an injectable formulation, for the potential use in the treatment of inflammatory diseases including Crohn's disease. In November 2013, the biosimilar was listed as being in preclinical development. In June 2015, this was still the case. In November 2013, the company was seeking to outlicense the biosimilar.

PF-688 DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Inflammatory disease	US	Discovery	26-Mar-2013

PF-688 DRUG NAMES

Names	Type
certolizumab pegol	INN
certolizumab pegol biosimilar, Pfenex	
PF-688	Research Code

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PRIMALVAC

PRIMALVAC SNAPSHOT

Drug Name	PRIMALVAC
Key Synonyms	
Originator Company	European Vaccine Initiative
Active Companies	INSERM;European Vaccine Initiative;Pfenex Inc
Inactive Companies	
Highest Status	Discovery
Active Indications	Plasmodium infection
Target-based Actions	
Other Actions	Protein subunit vaccine;Prophylactic vaccine
Technologies	Biological therapeutic;Protein recombinant
Last Change Date	20-Feb-2015

PRIMALVAC DEVELOPMENT PROFILE

SUMMARY

European Vaccine Initiative, INSERM and Pfenex are investigating PRIMALVAC, a vaccine comprised of var2 chondroitin sulfate A (var2CSA), for the potential prevention of pregnancy related malaria. In February 2015, a phase I trial was in preparation and was expected to be initiated in 2015.

PRIMALVAC DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
European Vaccine Initiative	Plasmodium infection	Germany	Discovery	30-Sep-2011
INSERM	Plasmodium infection	France	Discovery	30-Sep-2011
Pfenex Inc	Plasmodium infection	US	Discovery	30-Sep-2011

PRIMALVAC DRUG NAMES

Names	Type
PRIMALVAC	

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peginterferon beta 1b, Pfenex

peginterferon beta 1b, Pfenex SNAPSHOT

Drug Name	peginterferon beta 1b, Pfenex
Key Synonyms	
Originator Company	Pfenex/Stelis Joint Venture
Active Companies	Pfenex Inc
Inactive Companies	Pfenex/Stelis Joint Venture
Highest Status	Discovery
Active Indications	Unidentified indication
Target-based Actions	Interferon beta ligand
Other Actions	
Technologies	PEGylated formulation;Biological therapeutic;Parenteral formulation unspecified;Protein recombinant
Last Change Date	19-Jun-2015

peginterferon beta 1b, Pfenex DEVELOPMENT PROFILE

SUMMARY

Pfenex (following the removal of program from Joint Development and License Agreement) is investigating peginterferon beta 1b (PF-726; presumed to be PF-756), for the potential treatment of undisclosed indication ,. In March 2015, development was ongoing.

Pfenex/Stelis Joint Venture, an unnamed joint venture created by Pfenex and Stelis was previosuly investigating peginterferon beta 1b, for the potential treatment of undisclosed indication. However, in March 2015, the program was removed from the Joint Development and License Agreement.

peginterferon beta 1b, Pfenex DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex Inc	Unidentified indication	Malaysia	Discovery	16-Mar-2015
Pfenex/Stelis Joint Venture	Unidentified indication	Malaysia	Discontinued	16-Mar-2015

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peginterferon beta 1b, Pfenex DRUG NAMES

Names	Type
peginterferon beta 1B	
peginterferon beta 1b, Pfenex	
PF-756	
PF-726	Research Code

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peg-aspargase biosimilar, Pfenex/Stelis Joint Venture

peg-aspargase biosimilar, Pfenex/Stelis Joint Venture SNAPSHOT

Drug Name	peg-aspargase biosimilar, Pfenex/Stelis Joint Venture
Key Synonyms	pegaspargase
Originator Company	Pfenex/Stelis Joint Venture
Active Companies	Pfenex/Stelis Joint Venture
Inactive Companies	
Highest Status	Discovery
Active Indications	Acute lymphoblastic leukemia
Target-based Actions	Asparaginase stimulator
Other Actions	Anticancer
Technologies	Recombinant enzyme;PEGylated formulation;Biological therapeutic;Parenteral formulation unspecified;Protein recombinant
Last Change Date	19-Jun-2015

peg-aspargase biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT PROFILE

SUMMARY

Pfenex/Stelis Joint Venture is investigating, PF-690, a biosimilar version of peg-aspargase (Oncaspar), presumed to be for the potential treatment of acute lymphoblastic leukemia (ALL). ,. In June 2015, preclinical development was ongoing .

peg-aspargase biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex/Stelis Joint Venture	Acute lymphoblastic leukemia	Malaysia	Discovery	16-Apr-2013

peg-aspargase biosimilar, Pfenex/Stelis Joint Venture DRUG NAMES

Names	Type
PF-690	Research Code
pegaspargase	INN, USAN
peg-aspargase biosimilar, Pfenex/Stelis Joint Venture	

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peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture

peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture SNAPSHOT

Drug Name	peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture
Key Synonyms	peginterferon alfa-2a
Originator Company	Pfenex/Stelis Joint Venture
Active Companies	Pfenex/Stelis Joint Venture
Inactive Companies	
Highest Status	Discovery
Active Indications	Hepatitis C virus infection
Target-based Actions	Interferon alpha 2 ligand
Other Actions	Anti-inflammatory;Antiviral
Technologies	Biological therapeutic;Parenteral formulation unspecified;Protein recombinant
Last Change Date	19-Jun-2015

peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT PROFILE

SUMMARY

Pfenex/Stelis Joint Venture is investigating PF-694, a biosimilar version of peg-interferon alpha- 2a (Pegasys), presumed to be for the the potential treatment of hepatitis C virus (HCV) infection ,. In May 2014, a phase I trial was planned to be initiated in the second half of 2015 In June 2015, preclinical development was ongoing .

peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex/Stelis Joint Venture	Hepatitis C virus infection	Malaysia	Discovery	16-Apr-2013

peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture DRUG NAMES

Names	Type
PF-694	Research Code
peg-interferon alpha-2a biosimilar, Pfenex/Stelis Joint Venture	
peginterferon alfa-2a	BANN, INN

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somatropin biosimilar, Pfenex/Stelis Joint Venture

somatropin biosimilar, Pfenex/Stelis Joint Venture SNAPSHOT

Drug Name	somatropin biosimilar, Pfenex/Stelis Joint Venture
Key Synonyms	somatropin
Originator Company	Pfenex/Stelis Joint Venture
Active Companies	Pfenex/Stelis Joint Venture
Inactive Companies	
Highest Status	Discovery
Active Indications	Growth hormone deficiency
Target-based Actions	Growth hormone ligand
Other Actions	
Technologies	Biological therapeutic;Parenteral formulation unspecified;Protein recombinant
Last Change Date	18-Jun-2015

somatropin biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT PROFILE

SUMMARY

Pfenex/Stelis Joint Venture is investigating PF-444, a biosimilar version of human growth hormone Genotropin, a recombinantly produced somatropin, for the potential treatment of growth hormone deficiency,. In June 2015, preclinical development was ongoing .

somatropin biosimilar, Pfenex/Stelis Joint Venture DEVELOPMENT STATUS

CURRENT DEVELOPMENT STATUS

Company	Indication	Country	Development Status	Date
Pfenex/Stelis Joint Venture	Growth hormone deficiency	Malaysia	Discovery	16-Apr-2013

somatropin biosimilar, Pfenex/Stelis Joint Venture DRUG NAMES

Names	Type
PF-444	Research Code
somatropin	BAN, INN, USAN
somatropin biosimilar, Pfenex/Stelis Joint Venture	

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