

## FibroGen Inc

### COMPANY AND PIPELINE OVERVIEW REPORT

Coverage of the company and a summary of the drug pipeline portfolio.

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#### THOMSON REUTERS

3 Times Square  
New York, New York 10036  
United States

Tel: +1 646 223 4000

[thomsonreuters.com](http://thomsonreuters.com)

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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i.e. where the development status for the drug(s) is one of the following: No Development Reported, Discontinued, or Withdrawn.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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# FibroGen Inc

## COMPANY OVERVIEW

Company Name	FibroGen Inc
Parent Company Name	FibroGen Inc
Website	<a href="http://www.fibrogen.com/">http://www.fibrogen.com/</a>
Country	US
Number of Drugs in Active Development	6
Number of Inactive Drugs	6
Number of Patents as Owner	68
Number of Patents as Third Party	2
Number of Deals	12
Key Indications	Anemia, Myocardial infarction, Stroke, Focal segmental glomerulosclerosis, Diabetic nephropathy, Idiopathic pulmonary fibrosis, Multiple sclerosis, Pancreas tumor, Glaucoma, Glioma, Liver fibrosis, Renal injury
Key Target-based Actions	HIF prolyl hydroxylase inhibitor, TGF beta antagonist, Connective tissue growth factor ligand inhibitor, Bone morphogenetic protein-1 ligand inhibitor, HIF prolyl hydroxylase-1 modulator, Albumin modulator, Angiotensin receptor antagonist, CD66e antagonist, CTGF gene inhibitor, Calcineurin inhibitor, Collagen III agonist, Desmin inhibitor, Dopamine receptor agonist, Erythropoietin receptor agonist, HIF prolyl hydroxylase-1 inhibitor, IL-6 agonist, LDL receptor antagonist, Prolyl hydroxylase inhibitor, TGF beta agonist
Key Technologies	Small molecule therapeutic, Biological therapeutic, Oral formulation, Peptide, Protein recombinant, Capsule formulation, Infusion, Intravenous formulation, Monoclonal antibody human, Drug

## COMPANY PROFILE

### SUMMARY

FibroGen Inc, founded in 1994, is a privately held biotechnology company which has developed the only commercially viable method known to produce human collagen and human gelatin in recombinant systems. The company's therapeutic target areas include fibrotic disorders affecting the major organs, diabetes, surgical procedures, and fibroproliferative tumor progression and metastasis.

### COMPANY LOCATION

Fibrogen's headquarters are in San Francisco, CA. Fibrogen Europe, a subsidiary of Fibrogen based in Helsinki, Finland, is a biotechnology focused enterprise that specialises in the development of recombinant collagens and gelatins.

### LICENSING AGREEMENTS

In January 2001, FibroGen and Aventis Pasteur formed a collaboration agreement to develop, using FibroGen's proprietary technology, novel synthetic gelatins with the potential to confer optimum stabilization and activity attenuation specific for certain Aventis Pasteur vaccines.

As of October 1999, FibroGen had a research and development agreement with Medarex Inc to develop monoclonal antibodies to block the fibrogenic cascade. In July 1998, FibroGen signed an agreement with Medarex for the use of the HuMab mouse antibody technology to develop potential antifibrotic therapies using FibroGen's proprietary targets.

In September 1999, FibroGen announced a collaboration with Taisho Pharmaceutical Co Ltd to develop and commercialize human monoclonal antibodies for the treatment of fibrotic kidney diseases; however, no development has been reported by Taisho since May 2002 and in August 2005 this strategic alliance was not listed on FibroGen's website.

In 1997, FibroGen licensed ArQule's Mapping Array program to discover and develop drug candidates for fibrosis and excessive scarring; however, since 2002, no development had been reported on this deal.

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## EARLY R&D/TECHNOLOGY UPDATES/IP NEWS

In December 1998, FibroGen received US-05837258, covering the use of connective tissue growth factor to induce the repair of connective tissue, including bone, cartilage and skin.

As of June 1998, programs were underway at FibroGen for the development of small-molecules which modulate collagen scar formation and human antibodies to neutralize cytokine and enzyme targets.

## FINANCIAL

In February 2005, FibroGen raised net proceeds of \$100 million from a completed a private placement of convertible preferred stock, 15% of which was sold to existing investors. The funds would be used to expand the company's clinical trial activities including anemia, idiopathic pulmonary fibrosis and diabetic nephropathy. New clinical programs in acute renal failure and in rare diseases in anemia and in fibrosis would also be launched, and the metastatic cancers program extended. The funds would also be used for efficacy studies and commercial-scale manufacturing of injectable recombinant human collagen.

In September 2000, FibroGen completed a \$56.7 million private placement of convertible preferred stock.

## R&D GRANTS

In April 1999, the Finnish government reported that it would fund 50% of the company's recombinant collagen and gelatin costs.

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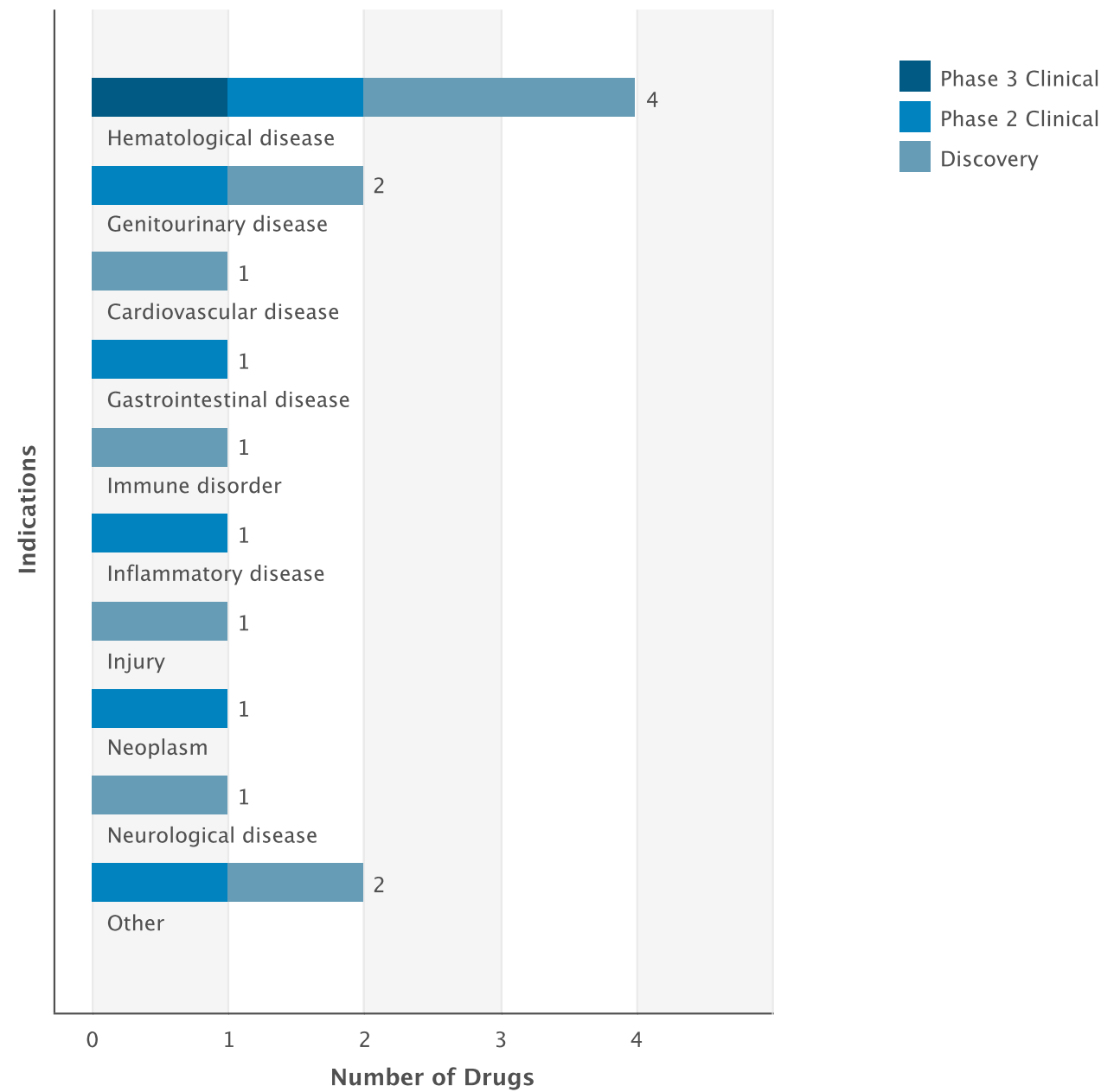


PRODUCT PORTFOLIO SUMMARY

DRUGS

Drugs by Indication

Active Drugs by Indication Chart



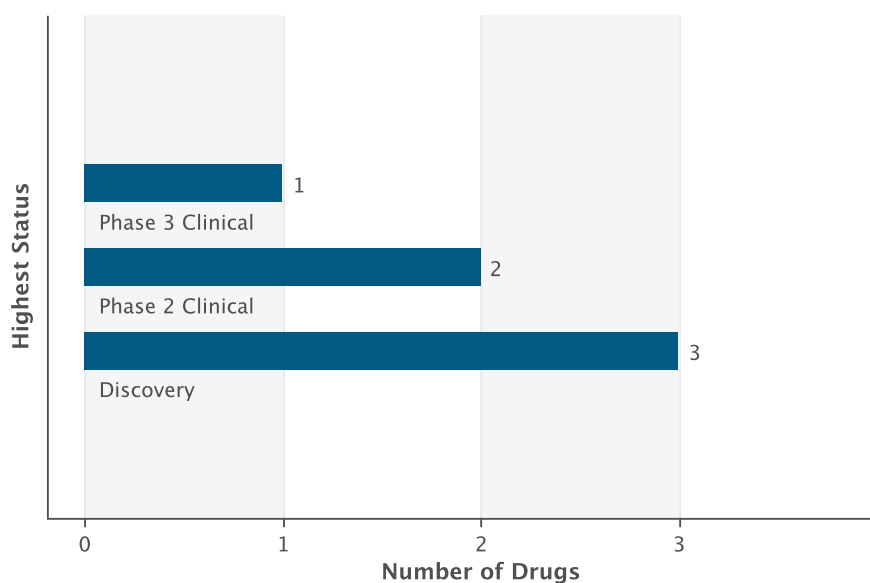
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## Drugs by Indication Table

Indication	Active	Inactive	Total
Inflammatory disease	1	4	5
Hematological disease	4	0	4
Musculoskeletal disease	0	3	3
Neoplasm	1	1	2
Gastrointestinal disease	1	1	2
Genitourinary disease	2	0	2
Injury	1	1	2
Neurological disease	1	1	2
Cardiovascular disease	1	1	2
Respiratory disease	1	0	1
Immune disorder	1	0	1
Genetic disorder	0	1	1
Dermatological disease	0	1	1
Ocular disease	1	0	1

## Drugs by Highest Status

Active Drugs by Highest Status Chart



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## Drugs by Highest Status Table

Development Status	Number of Drugs
Phase 3 Clinical	1
Phase 2 Clinical	2
Discovery	3
No Development Reported	6

## DEALS

Deal Type	Principal		Partner		Total
	Active	Inactive	Active	Inactive	
Technology - Other Proprietary	1	0	2	0	3
Drug - Funding	3	0	0	0	3
Drug - Development/Commercialization License	4	0	1	0	5
Technology - Target Validation	0	0	1	0	1

## CLINICAL TRIALS

### Trials by Condition Studied

Condition Studied	Ongoing	All
Hematological disease	4	18
Genitourinary disease	0	7
Inflammatory disease	1	5
Gastrointestinal disease	1	4
Metabolic disorder	0	3
Endocrine disease	0	3
Respiratory disease	1	3
Dermatological disease	0	1
Neoplasm	0	1
Genetic disorder	0	1
Neurological disease	0	1
Cardiovascular disease	0	1

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## Trials by Phase

Phase	Ongoing	All
Phase 3	3	4
Phase 2	3	16
Phase 1	0	9
Phase not specified	0	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

## PATENTS \*

Indication	As Owner	As Third Party	Total
Cardiovascular disease	34	1	35
Endocrine disease	12	0	12
Gastrointestinal disease	22	0	22
Genitourinary disease	24	1	25
Growth disorder	3	0	3
Hematological disease	22	0	22
Degeneration	1	0	1
Immune disorder	9	0	9
Psychiatric disorder	1	0	1
Musculoskeletal disease	17	2	19
Neoplasm	12	1	13
Ocular disease	6	0	6
Genetic disorder	1	0	1
Metabolic disorder	17	2	19
Neurological disease	14	1	15

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Nutritional disorder	2	0	2
Prophylaxis	1	0	1
Respiratory disease	22	0	22
Infectious disease	7	0	7
Injury	6	0	6
Inflammatory disease	30	3	33
Gynecology and obstetrics	3	0	3
Dermatological disease	5	0	5
Ulcer	2	0	2
Surgical procedure	0	1	1

\* 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 DRUGS

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

### roxadustat

<b>Drug Name</b>	roxadustat
<b>Key Synonyms</b>	ciclopirox, roxadustat
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	Astellas Pharma Inc, FibroGen Inc, AstraZeneca plc
<b>Inactive Companies</b>	Zeneca Group plc
<b>Highest Status</b>	Phase 3 Clinical
<b>Active Indications</b>	Anemia
<b>Target-based Actions</b>	HIF prolyl hydroxylase inhibitor
<b>Other Actions</b>	Fibrosuppressant, Neuroprotectant
<b>Technologies</b>	Oral formulation, Capsule formulation, Small molecule therapeutic
<b>Last Change Date</b>	07-Feb-2014

### FG-3019

<b>Drug Name</b>	FG-3019
<b>Key Synonyms</b>	
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	FibroGen Inc
<b>Inactive Companies</b>	Taisho Pharmaceutical Co Ltd
<b>Highest Status</b>	Phase 2 Clinical
<b>Active Indications</b>	Liver fibrosis, Diabetic nephropathy, Pancreas tumor, Glaucoma, Glioma, Focal segmental glomerulosclerosis, Idiopathic pulmonary fibrosis
<b>Target-based Actions</b>	Connective tissue growth factor ligand inhibitor
<b>Other Actions</b>	Angiogenesis inhibitor, Fibrosuppressant, Anticancer monoclonal antibody
<b>Technologies</b>	Monoclonal antibody human, Intravenous formulation, Infusion, Biological therapeutic, Protein recombinant
<b>Last Change Date</b>	20-Dec-2013

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**FG-2216**

<b>Drug Name</b>	FG-2216
<b>Key Synonyms</b>	
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	FibroGen Inc, Astellas Pharma Inc
<b>Inactive Companies</b>	Yamanouchi Pharmaceutical Co Ltd
<b>Highest Status</b>	Phase 2 Clinical
<b>Active Indications</b>	Anemia
<b>Target-based Actions</b>	HIF prolyl hydroxylase inhibitor
<b>Other Actions</b>	Hematopoietic stimulant, Erythropoietin release stimulator
<b>Technologies</b>	Oral formulation, Small molecule therapeutic
<b>Last Change Date</b>	05-Feb-2014

**HIF-PH inhibitors (myocardial infarction/renal injury/stroke/multiple sclerosis), FibroGen**

<b>Drug Name</b>	HIF-PH inhibitors (myocardial infarction/renal injury/stroke/multiple sclerosis), FibroGen
<b>Key Synonyms</b>	
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	FibroGen Inc
<b>Inactive Companies</b>	
<b>Highest Status</b>	Discovery
<b>Active Indications</b>	Renal injury, Myocardial infarction, Stroke, Multiple sclerosis
<b>Target-based Actions</b>	HIF prolyl hydroxylase inhibitor
<b>Other Actions</b>	Cardiovascular agent, Renal system agent
<b>Technologies</b>	Small molecule therapeutic
<b>Last Change Date</b>	27-Dec-2011

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**FG-6874**

<b>Drug Name</b>	FG-6874
<b>Key Synonyms</b>	
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	FibroGen Inc
<b>Inactive Companies</b>	
<b>Highest Status</b>	Discovery
<b>Active Indications</b>	Anemia
<b>Target-based Actions</b>	
<b>Other Actions</b>	Unspecified drug target, Blood system agent
<b>Technologies</b>	Small molecule therapeutic
<b>Last Change Date</b>	06-Sep-2012

**next generation HIF-PH inhibitors (anemia), FibroGen**

<b>Drug Name</b>	next generation HIF-PH inhibitors (anemia), FibroGen
<b>Key Synonyms</b>	
<b>Originator Company</b>	FibroGen Inc
<b>Active Companies</b>	FibroGen Inc
<b>Inactive Companies</b>	
<b>Highest Status</b>	Discovery
<b>Active Indications</b>	Anemia
<b>Target-based Actions</b>	HIF prolyl hydroxylase inhibitor
<b>Other Actions</b>	Blood system agent
<b>Technologies</b>	Small molecule therapeutic
<b>Last Change Date</b>	02-Jan-2012

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