Secukinumab

Targets (1) Biointeractions (1)

IDENTIFICATION

Name

Secukinumab

Accession Number

DB09029

Type

Biotech

Groups

Approved

Biologic Classification

Protein Based Therapies
Monoclonal antibody (mAb)

Description

Secukinumab (Cosentyx) is a human monoclonal antibody designed for the treatment of uveitis, rheumatoid arthritis, ankylosing spondylitis, and psoriasis. Secukinumab is an interleukin-17A (IL-17A) inhibitor marketed by Novartis. IL-17 is a group of proinflammatory cytokines released by cells of the immune system and and exist in higher levels in many immune conditions associated with chronic inflammation. By targeting IL-17A, secukinumab has shown excellent efficacy in psoriasis by normalizing skin histology and was approved by the United States Food and Drug Administration on January 21, 2015 to treat adults with moderate-to-severe plaque psoriasis.

Protein structure

Protein chemical formula

$C_{6584}H_{10134}N_{1754}O_{2042}S_{44}$

Protein average weight

147940.0 Da

Sequences

```
APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK
PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT
LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKL
TVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
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> Secukinumab Light Chain (CAS 875356-44-8)
EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAPRLLIYGASSRATGIP
DRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYGSSPCTFGQGTRLEIKRTVAAPSVFIFP
PSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTL
TLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
```

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Synonyms

Not Available

External IDs

AIN-457 / AIN457 / AIN457A

Prescription Products

Search

NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END		
Cosentyx	Solution	150 mg	Subcutaneous	Novartis	2015-04-10	Not applicable		
Cosentyx	Injection	150 mg/mL	Subcutaneous	Novartis	2015-01-21	Not applicable		
Cosentyx	Powder, for solution	150 mg	Subcutaneous	Novartis	Not applicable	Not applicable		

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Categories

Amino Acids, Peptides, and Proteins

Antibodies

Antineoplastic and Immunomodulating Agents

Blood Proteins

Globulins

Immunoglobulins

Immunoproteins

Immunosuppressive Agents

Interleukin Inhibitors

Interleukin-17, antagonists & inhibitors

Interleukin-17A Antagonist

Serum Globulins

UNII

DLG4EML025

CAS number

1229022-83-6

PHARMACOLOGY

Indication

For the treatment of moderate to severe plaque psoriasis in patients that are candidates for systemic therapy or phototherapy.

Structured Indications

Ankylosing Spondylitis (AS)

Psoriatic Arthritis

Severe Plaque psoriasis

Moderate Plaque psoriasis

Pharmacodynamics

Not Available

Mechanism of action

Secukinumab is a human monoclonal antibody that targets IL-17A cytokine to downregulate inflammation in psoriasis, an autoimmune dermatological disease. The pathophysiology of psoriasis has not been fully established, however it is known that dysregulation of innate and adaptive immune responses plays part in the chronic inflammation associated with the disease. IL-17 represents is a six-membered family (IL-17A to F) of pleiotropic pro-inflammatory cytokines, expression of which is found to be elevated in psoriatic skin. These cytokines act on many different cell types and provide defense against different extracellular pathogens causing fungal or bacterial infections. IL-17 cytokines are produced by many cells involved in immune system defense, such as Th17, mast cells, neutrophils, and dendritic cells - all implicated in promoting inflammation. There is evidence linking IL-17 to pathogenesis of multiple autoimmune diseases including rheumatoid arthritis, spondyloarthritis, psoriasis, Crohn's disease, multiple sclerosis, and even atherosclerosis.

(A) Interleukin-17A

antagonist

Human

Absorption

Bioavailability after subcutaneous administration was 55-77%.

Volume of distribution

Volume of distribution (Vd) in interstitial fluid of skin (+/- psoriasis) was 27-40% of that in serum

Not Available

Metabolism

Mainly intracellular breakdown.

Route of elimination

Not Available

Half life

22-31 days

Clearance

Serum clearance was increased with higher body weights.

Toxicity

Not Available

Affected organisms

Humans and other mammals

Pathways

Not Available

Pharmacogenomic Effects/ADRs

Not Available

INTERACTIONS

Drug Interactions

Search

DRUG	INTERACTION	DRUG GROUP
Anthrax immune globulin human	The therapeutic efficacy of Anthrax immune globulin human can be decreased when used in combination with Secukinumab.	Approved
Bacillus calmette-guerin substrain connaught live antigen	The therapeutic efficacy of Bacillus calmette-guerin substrain connaught live antigen can be decreased when used in combination with Secukinumab.	Approved, Investigational
Bacillus calmette-guerin substrain tice live antigen	The therapeutic efficacy of Bacillus calmette-guerin substrain tice live antigen can be decreased when used in combination with Secukinumab.	Approved
BCG vaccine	The therapeutic efficacy of BCG vaccine can be decreased when used in combination with Secukinumab.	Investigational
Clostridium tetani toxoid antigen (formaldehyde inactivated)	The therapeutic efficacy of Clostridium tetani toxoid antigen (formaldehyde inactivated) can be decreased when used in combination with Secukinumab.	Approved

antigen (formaldehyde inactivated)	(formaldehyde inactivated) can be decreased when used in combination with Secukinumab.	
Denosumab	The risk or severity of adverse effects can be increased when Denosumab is combined with Secukinumab.	Approved
Fingolimod	Secukinumab may increase the immunosuppressive activities of Fingolimod.	Approved, Investigational
G17DT	The therapeutic efficacy of G17DT can be decreased when used in combination with Secukinumab.	Investigational
GI-5005	The therapeutic efficacy of GI-5005 can be decreased when used in combination with Secukinumab.	Investigational
Hepatitis A Vaccine	The therapeutic efficacy of Hepatitis A Vaccine can be decreased when used in combination with Secukinumab.	Approved
Hepatitis B Vaccine (Recombinant)	The therapeutic efficacy of Hepatitis B Vaccine (Recombinant) can be decreased when used in combination with Secukinumab.	Approved, Withdrawn
Human rabies virus immune globulin	The therapeutic efficacy of Human rabies virus immune globulin can be decreased when used in combination with Secukinumab.	Approved
INGN 201	The therapeutic efficacy of INGN 201 can be decreased when used in combination with Secukinumab.	Investigational
INGN 225	The therapeutic efficacy of INGN 225 can be decreased when used in combination with Secukinumab.	Investigational
Japanese encephalitis virus strain sa 14-14-2 antigen (formaldehyde inactivated)	The therapeutic efficacy of Japanese encephalitis virus strain sa 14-14-2 antigen (formaldehyde inactivated) can be decreased when used in combination with Secukinumab.	Approved
Leflunomide	The risk or severity of adverse effects can be increased when Secukinumab is combined with Leflunomide.	Approved, Investigational
Natalizumab	The risk or severity of adverse effects can be increased when Secukinumab is combined with Natalizumab.	Approved, Investigational
Ocrelizumab	Ocrelizumab may increase the immunosuppressive activities of Secukinumab.	Approved, Investigational
Pimecrolimus	The risk or severity of adverse effects can be increased when Pimecrolimus is combined with Secukinumab.	Approved, Investigational
Rabies virus inactivated antigen, A	The therapeutic efficacy of Rabies virus inactivated antigen, A can be decreased when used in combination with Secukinumab.	Approved, Investigational
Rindopepimut	The therapeutic efficacy of Rindopepimut can be decreased when used in combination with Secukinumab.	Investigational
Roflumilast	Roflumilast may increase the immunosuppressive activities of Secukinumab.	Approved
Rotavirus Vaccine	The therapeutic efficacy of Rotavirus Vaccine can be decreased when used in combination with Secukinumab.	Approved
Rubella virus vaccine	The therapeutic efficacy of Rubella virus vaccine can be decreased when used in combination with Secukinumab.	Approved, Investigational
Salmonella typhi ty2 vi polysaccharide antigen	The therapeutic efficacy of Salmonella typhi ty2 vi polysaccharide antigen can be decreased when used in combination with Secukinumab.	Approved
Salmonella typhi ty21a live antigen	The therapeutic efficacy of Salmonella typhi ty21a live antigen can be decreased when used in combination with Secukinumab.	Approved
Sipuleucel-T	The therapeutic efficacy of Sipuleucel-T can be decreased when used in combination with Secukinumab.	Approved, Investigational
SRP 299	The therapeutic efficacy of SRP 299 can be decreased when used in combination with Secukinumab.	Investigational
Tacrolimus	Tacrolimus may increase the immunosuppressive activities of Secukinumab.	Approved,

	combination with Secukinumab.	
TG4010	The therapeutic efficacy of TG4010 can be decreased when used in combination with Secukinumab.	Investigational
Tofacitinib	Secukinumab may increase the immunosuppressive activities of Tofacitinib.	Approved, Investigational
Trastuzumab	Trastuzumab may increase the neutropenic activities of Secukinumab.	Approved, Investigational
Varicella Zoster Vaccine (Live/Attenuated)	The therapeutic efficacy of Varicella Zoster Vaccine (Live/Attenuated) can be decreased when used in combination with Secukinumab.	Approved
Yellow fever vaccine	The therapeutic efficacy of Yellow fever vaccine can be decreased when used in combination with Secukinumab.	Approved, Investigational

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Food Interactions

No interactions found.

REFERENCES

General References

1. McInnes IB, Sieper J, Braun J, Emery P, van der Heijde D, Isaacs JD, Dahmen G, Wollenhaupt J, Schulze-Koops H, Kogan J, Ma S, Schumacher MM, Bertolino AP, Hueber W, Tak PP: Efficacy and safety of secukinumab, a fully human anti-interleukin-17A monoclonal antibody, in patients with moderate-to-severe psoriatic arthritis: a 24-week, randomised, double-blind, placebo-controlled, phase II proof-of-concept trial. Ann Rheum Dis. 2014 Feb;73(2):349-56. doi: 10.1136/annrheumdis-2012-202646. Epub 2013 Jan 29. [PubMed:23361084]
2. Jaleel T, Elmets C, Weinkle A, Kassira S, Elewski B: Secukinumab (AIN-457) for the treatment of Psoriasis. Expert Rev Clin Pharmacol. 2016 Feb;9(2):187-202. doi: 10.1586/17512433.2016.1129894. [PubMed:26647300]
3. Wong IT, Shojania K, Dutz J, Tsao NW: Clinical and economic review of secukinumab for moderate-to-severe plaque psoriasis. Expert Rev Pharmacoecon Outcomes Res. 2016 Apr;16(2):153-66. doi: 10.1586/14737167.2016.1133301. Epub 2016 Feb 2. [PubMed:26681527]
4. Roman M, Madkan VK, Chiu MW: Profile of secukinumab in the treatment of psoriasis: current perspectives. Ther Clin Risk Manag. 2015 Dec 2;11:1767-77. doi: 10.2147/TCRM.S79053. eCollection 2015. [PubMed:26664127]

External Links

KEGG Drug

D09967

PubChem Substance

347910391

ChEMBL

CHEMBL1743068

RxList

RxList Drug Page

Drugs.com

Drugs.com Drug Page

Wikipedia

- L04AC — Interleukin inhibitors
- L04A — IMMUNOSUPPRESSANTS
- L04 — IMMUNOSUPPRESSANTS
- L — ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS

AHFS Codes

84:92.00 — Misc. Skin and Mucous Membrane Agents

CLINICAL TRIALS

Clinical Trials

Search

PHASE	STATUS	PURPOSE	CONDITIONS	COUNT
0	Recruiting	Treatment	Hidradenitis Suppurativa (HS)	1
1	Completed	Basic Science	Healthy Volunteers / Psoriasis	1
1	Completed	Basic Science	Moderate to Severe Plaque Psoriasis	1
1	Not Yet Recruiting	Treatment	Pityriasis Rubra Pilaris	1
1, 2	Completed	Basic Science	Healthy Volunteers	1
1, 2	Completed	Basic Science	Plaque Psoriasis	1
1, 2	Completed	Basic Science	Rheumatoid Arthritis	1
1, 2	Completed	Treatment	Chronic Plaque-type Psoriasis	1
1, 2	Recruiting	Treatment	Papulopustular Rosacea	1
1, 2	Recruiting	Treatment	Pyoderma Gangrenosum	1
2	Completed	Not Available	Ankylosing Spondylitis (AS)	1
2	Completed	Treatment	Active Uveitis That is Not From an Infection	1
2	Completed	Treatment	Ankylosing Spondylitis (AS)	1
2	Completed	Treatment	Chronic Plaque Psoriasis	2
2	Completed	Treatment	Chronic Plaque-type Psoriasis	2
2	Completed	Treatment	Disseminated Sclerosis	1
2	Completed	Treatment	Eye Dryness	1
2	Completed	Treatment	Plaque-Type Psoriasis	1
2	Completed	Treatment	Psoriasis, Plaque-type Psoriasis	1
2	Completed	Treatment	Psoriatic Arthritis	2
2	Completed	Treatment	Relapsing Remitting Multiple Sclerosis (RRMS) / RRMS	1
2	Completed	Treatment	Rheumatoid Arthritis	3
2	Not Yet Recruiting	Treatment	Psoriasis	1

2	Recruiting	Basic Science	Psoriatic Arthritis	1
2	Recruiting	Treatment	Atopic Dermatitis (AD)	1
2	Recruiting	Treatment	Autosomal Recessive Congenital Ichthyosis / Congenital Ichthyosiform Erythroderma / Epidermolytic Ichthyosis / Ichthyosis / Lamellar Ichthyosis / Netherton Syndrome	1
2	Recruiting	Treatment	Psoriasis	1
2	Recruiting	Treatment	Tendinopathy	1
2	Terminated	Treatment	Alopecia Areata (AA)	1
2	Terminated	Treatment	Asthma Bronchial	1
2	Terminated	Treatment	Crohn's Disease (CD)	1
2	Terminated	Treatment	Crohn's Disease (CD) / Inflammatory Bowel Diseases (IBD)	1
2	Terminated	Treatment	Diabetes, Diabetes Mellitus Type 1	1
2	Terminated	Treatment	Disseminated Sclerosis	1
2	Terminated	Treatment	Inflammatory Diseases / Polymyalgia Rheumatica	1
3	Active Not Recruiting	Treatment	Anklyosing Spondylitis	1
3	Active Not Recruiting	Treatment	Ankylosing Spondylitis (AS)	4
3	Active Not Recruiting	Treatment	Moderate to Severe Chronic Plaque-Type Psoriasis	1
3	Active Not Recruiting	Treatment	Moderate to Severe Nail Psoriasis	1
3	Active Not Recruiting	Treatment	Plaque Psoriasis	2
3	Active Not Recruiting	Treatment	Plaque Type Psorisis	1
3	Active Not Recruiting	Treatment	Psoriasis	1
3	Active Not Recruiting	Treatment	Psoriatic Arthritis	5
3	Completed	Basic Science	Spondylarthropathy	1
3	Completed	Treatment	Ankylosing Spondylitis (AS)	1
3	Completed	Treatment	Behcet's Syndrome	1
3	Completed	Treatment	Chronic Plaque Psoriasis	1
3	Completed	Treatment	Chronic Plaque Type Psoriasis	1
3	Completed	Treatment	Chronic Scalp Psoriasis	1
3	Completed	Treatment	Moderate to Severe Palmoplantar Psoriasis	1
3	Completed	Treatment	Moderate to Severe Plaque-type Psoriasis	5
3	Completed	Treatment	Plaque Psoriasis	1
3	Completed	Treatment	Plaque-Type Psoriasis	2
3	Completed	Treatment	Psoriasis	6
3	Completed	Treatment	Psoriatic Arthritis	1
3	Completed	Treatment	Rheumatoid Arthritis	3

3	Recruiting	Treatment	Allergic Contact Dermatitits	1
3	Recruiting	Treatment	Ankylosing Spondyloarthritis	1
3	Recruiting	Treatment	Axial Psoratic Arthritis	1
3	Recruiting	Treatment	Chronic Severe Plaque-type Psoriasis	1
3	Recruiting	Treatment	Enthesitis-related Arthritis / Juvenile psoriatic arthritis	1
3	Recruiting	Treatment	Enthesitis / Psoriatic Arthritis / Spondyloarthritis, Axial	1
3	Recruiting	Treatment	Non-radiographic Spondyloarthritis	1
3	Recruiting	Treatment	Psoriatic Arthritis	2
3	Recruiting	Treatment	Spondyloarthritis	1
3	Terminated	Treatment	Non-Infectious Uveitis	2
3	Terminated	Treatment	Rheumatoid Arthritis	1
3	Terminated	Treatment	Uveitis	3
3	Withdrawn	Treatment	Uveitis	1
4	Active Not Recruiting	Treatment	Chronic Plaque Psoriasis	1
4	Active Not Recruiting	Treatment	Moderate to Severe Plaque Psoriasis	1
4	Active Not Recruiting	Treatment	Psoriatic Arthritis	1
4	Completed	Treatment	Plaque Psoriasis	1
4	Not Yet Recruiting	Treatment	Ankylosing Spondylitis (AS)	1
4	Recruiting	Basic Science	Psoriasis	1
4	Recruiting	Treatment	Ankylosing Spondylitis (AS)	1
4	Recruiting	Treatment	Plaque Psoriasis	2
4	Recruiting	Treatment	Psoriasis Vulgaris	1
Not Available	Recruiting	Not Available	Ankylosing Spondylitis (AS) / Psoriatic Arthritis / Rheumatoid Arthritis	1
Not Available	Recruiting	Not Available	Atopic Dermatitis (AD) / Psoriasis	1
Not Available	Recruiting	Not Available	Psoriasis Vulgaris	1

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PHARMACOECONOMICS

Manufacturers

Not Available

Packagers

Not Available

FORM	ROUTE	STRENGTH
Injection	Subcutaneous	150 mg/mL
Powder, for solution	Subcutaneous	150 mg
Solution	Subcutaneous	150 mg

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Prices

Not Available

Patents

Search

PATENT NUMBER	PEDIATRIC EXTENSION	APPROVED	EXPIRES (ESTIMATED)	
US20130202610	No	2010-10-08	2020-10-08	

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PROPERTIES

State

Solid

Experimental Properties

Not Available

TAXONOMY

Description

Not Available

Kingdom

Organic Compounds

Super Class

Organic Acids

Class

Carboxylic Acids and Derivatives

Sub Class

Amino Acids, Peptides, and Analogues

Not Available

Substituents

Not Available

Molecular Framework

Not Available

External Descriptors

Not Available

TARGETS

1. Interleukin-17A

Kind

Protein

Organism

Human

Pharmacological action

Yes

Actions

Antagonist

General Function

Cytokine receptor binding

Specific Function

Induces stromal cells to produce proinflammatory and hematopoietic cytokines. Enhances the surface expression of ICAM1/intracellular adhesion molecule 1 in fibroblasts.

Gene Name

IL17A

Uniprot ID

Q16552

Uniprot Name

Interleukin-17A

Molecular Weight

17503.92 Da

References

1. Ohtsuki M, Morita A, Abe M, Takahashi H, Seko N, Karpov A, Shima T, Papavassilis C, Nakagawa H: Secukinumab efficacy and safety in Japanese patients with moderate-to-severe plaque psoriasis: subanalysis from ERASURE, a randomized, placebo-controlled, phase 3 study. J Dermatol. 2014 Dec;41(12):1039-46. doi: 10.1111/1346-8138.12660. Epub 2014 Oct 30.