

Drugs



## Hypromellose

Targets (1)



## IDENTIFICATION

**Name** Hypromellose**Accession Number** DB11075**Type** Small Molecule**Groups** Approved

**Description** Hypromellose, or hydroxypropyl methylcellulose (HPMC) <sup>[6]</sup>, is a semisynthetic, inert, and viscoelastic polymer that forms a colloid solution when dissolved in water. It acts as a thickening agent, coating polymer, bioadhesive, solubility enhancer in solid dispersions, and binder in the process of granulation and in modified release formulations <sup>[2]</sup>. It is commonly used as a delivery component in oral pharmaceutical products that provides the release of a drug in a controlled fashion, effectively increasing the duration of release of a drug to prolong its therapeutic effects <sup>[1]</sup>. Hypromellose is also found in eye drops as a lubricant <sup>[3]</sup>.

**Synonyms**

- Cellulose hydroxypropyl methyl ether
- Cellulose, 2-hydroxypropyl methyl ether
- Hipromelosa
- Hydroxypropyl methylcellulose 2208
- Hydroxypropyl methylcellulose 2910
- Hydroxypropyl methylcellulose 4000
- Hydroxypropyl methylcelluloses
- Hydroxypropylmethylcellulose
- Hypromellose
- Hypromelloses

**Product Ingredients**

INGREDIENT	UNII	CAS	INCHI KEY
<a href="#">Hypromellose 2208 (100 mpa.s)</a>	<a href="#">B1QE5P712K</a>	Not Available	Not applicable
<a href="#">Hypromellose 2208 (15000 mpa.s)</a>	<a href="#">Z78RG6M2N2</a>	Not Available	Not applicable
<a href="#">Hypromellose 2906 (4000 mpa.s)</a>	<a href="#">5EYA69XGAT</a>	Not Available	Not applicable
<a href="#">Hypromellose 2906 (50 mpa.s)</a>	<a href="#">612E703ZUQ</a>	Not Available	Not applicable
<a href="#">Hypromellose 2910 (15 mpa.s)</a>	<a href="#">36SFW2JZ0W</a>	Not Available	Not applicable
<a href="#">Hypromellose 2910 (15000 mpa.s)</a>	<a href="#">288VBX44JC</a>	Not Available	Not applicable
<a href="#">Hypromellose 2910 (3 mpa.s)</a>	<a href="#">0VUT3PMY82</a>	Not Available	Not applicable
<a href="#">Hypromellose 2910 (4000 mpa.s)</a>	<a href="#">RN3152OP35</a>	Not Available	Not applicable

**Prescription Products**Show  entries

NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END
Mc	Solution	1 g	Rectal	E Z Em, Inc.	1982-12-31	2009-08-04

NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END
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## Over the Counter Products

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NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END
<b>Artelac Lubricant Eye Drops</b>	Solution	.32 %	Ophthalmic	Bausch & Lomb Inc	2005-03-25	2008-07-28
<b>Corneo Hypromellose</b>	Solution	0.3 %	Ophthalmic	Orimed Pharma Corporation	2015-09-16	Not applicable
<b>Genteal</b>	Solution	3 mg	Ophthalmic	Novartis	1997-10-17	Not applicable
<b>Genteal Gel</b>	Gel	0.3 %	Ophthalmic	Alcon, Inc.	2002-10-23	2016-05-30
<b>GenTeal Mild</b>	Liquid	0.002 L/1L	Ophthalmic	Novartis	2009-09-14	Not applicable
<b>GenTeal Mild to Moderate</b>	Liquid	0.003 L/1L	Ophthalmic	Novartis	2009-09-14	Not applicable
<b>GenTeal Severe</b>	Gel	.003 g/1g	Ophthalmic	Novartis Pharmaceuticals Corporation	2009-09-14	Not applicable
<b>Goniosoft</b>	Liquid	25 mg/1mL	Ophthalmic	O Cu Soft, Inc.	1989-10-02	Not applicable
<b>Goniovic Ophthalmic Lubricant</b>	Solution / drops	25 mg/1mL	Ophthalmic	Hub Pharmaceuticals	2011-11-10	Not applicable
<b>HylaTears</b>	Liquid	3 mg/10mL	Ophthalmic	Hyalogic LLC	2018-02-12	Not applicable

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## Mixture Products

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NAME	INGREDIENTS	DOSAGE	ROUTE	LABELLER	MARKETING START	MARKETING END
<b>Advanced Eye Relief/Redness Maximum Relief</b>	Hypromellose (5 mg/1mL) + <a href="#">Naphazoline hydrochloride</a> (0.3 mg/1mL)	Solution / drops	Ophthalmic	Preferreed Pharmaceuticals Inc.	2010-09-02	Not applicable
<b>Advanced Eye Relief/Redness Maximum Relief</b>	Hypromellose (5 mg/1mL) + <a href="#">Naphazoline hydrochloride</a> (0.3 mg/1mL)	Solution / drops	Ophthalmic	Bauch & Lomb Incorporated	2010-09-02	Not applicable
<b>Artificial Tears</b>	Hypromellose (0.002 mg/1mg) + <a href="#">Glycerin</a> (0.002 mg/1mg) + <a href="#">Polyethylene glycol 400</a> (0.01 mg/1mg)	Solution / drops	Ophthalmic	Geri-Care Pharmaceuticals, Corp	2018-06-01	Not applicable
<b>Artificial Tears</b>	Hypromellose (0.2 %) + <a href="#">Glycerin</a> (0.2 %)	Solution	Ophthalmic	Teva	2011-04-19	Not applicable
<b>Artificial Tears</b>	Hypromellose (0.3 %) + <a href="#">Dextran</a> (0.1 %)	Solution	Ophthalmic	Alcon, Inc.	2005-03-16	2009-02-24

NAME	INGREDIENTS	DOSAGE	ROUTE	LABELLER	MARKETING START	MARKETING END			
<b>Tears</b>	(2 mg/1mL) + <a href="#">Glycerin</a> (2 mg/1mL) + <a href="#">Polyethylene glycol 400</a> (10 mg/1mL)			Company					
<b>Bion Tears</b>	<a href="#">Hypromellose 2910 (4000 mpa.s)</a> (3 mg/1mL) + <a href="#">Dextran 70</a> (1 mg/1mL)	Solution / drops	Ophthalmic	ALCON LABORATORIES, INC.	1992-10-19	Not applicable			
<b>Bion Tears - Liq Oph</b>	Hypromellose (0.3 %) + <a href="#">Dextran 70</a> (0.1 %)	Solution / drops	Ophthalmic	Alcon, Inc.	1996-10-28	2016-10-20			
<b>CAREALL Artificial Tears</b>	Hypromellose (2 mg/1mL) + <a href="#">Glycerin</a> (2 mg/1mL) + <a href="#">Polyethylene glycol 400</a> (10 mg/1mL)	Solution / drops	Ophthalmic	New World Imports, Inc	2014-01-01	Not applicable			
<b>CAREALL Lubricating Eye Drops</b>	<a href="#">Hypromellose 2910 (4000 mpa.s)</a> (.3 mg/1mL) + <a href="#">Dextran 70</a> (.1 mg/1mL)	Solution / drops	Ophthalmic	New World Imports	2014-06-01	Not applicable			

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Unapproved/Other Products ⓘ

Show  entries

NAME	INGREDIENTS	DOSAGE	ROUTE	LABELLER	MARKETING START	MARKETING END			
<b>Entrocel</b>	Hypromellose (18 mg/1mL)	Solution	Oral	Mallinckrodt	2009-06-01	2012-10-31			
<b>Gonak Hypromellose</b>	<a href="#">Hypromellose 2906 (4000 mpa.s)</a> (25 mg/1mL) + <a href="#">Hypromellose 2906 (50 mpa.s)</a> (25 mg/1mL)	Solution	Ophthalmic	Akorn	1997-01-01	Not applicable			
<b>Gonak Hypromellose</b>	<a href="#">Hypromellose 2906 (4000 mpa.s)</a> (25 mg/1mL) + <a href="#">Hypromellose 2906 (50 mpa.s)</a> (25 mg/1mL)	Solution	Ophthalmic	Akorn	1997-01-01	Not applicable			
<b>Goniosoft</b>	Hypromellose (25 mg/1mL)	Liquid	Ophthalmic	O Cu Soft, Inc.	1989-10-02	Not applicable			
<b>Goniotaire</b>	<a href="#">Hypromellose 2906 (4000 mpa.s)</a> (25 mg/1mL)	Solution	Ophthalmic	Altaire Pharmaceuticals Inc.	2002-01-18	Not applicable			

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**International/Other Brands** Hymelose / Hyprosol / Ikleen / Intavis / Irimist / Melose / Melose Drop / Methocel / Naifa / Optichlor / Takflur

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**Categories**[Artificial Tears](#)[Biomedical and Dental Materials](#)[EENT Drugs, Miscellaneous](#)[Polymers](#)[Biopolymers](#)[Glucans](#)[Polysaccharides](#)[Carbohydrates](#)[Macromolecular Substances](#)[Sensory Organs](#)[Cellulose](#)[Ophthalmologicals](#)[Surgical Aids](#)[Compounds used in a research, industrial, or household setting](#)[Other Diagnostics](#)[Viscoelastic Substances](#)**UNII**[3NXW29V3WO](#)**CAS number**

9004-65-3

**Weight**

Not Available

**Chemical Formula**

Not Available

**InChI Key**

Not Available

**InChI**

Not Available

**IUPAC Name**

Not Available

**SMILES**

Not Available

## PHARMACOLOGY

**Indication**Protectant (ophthalmic) <sup>[4]</sup>Tears (artificial) <sup>[4]</sup>Lubricant (ophthalmic) <sup>[4]</sup>Diagnostic aid (contact lens procedures; gonioscopy) <sup>[4]</sup>**Pharmacodynamics**

Hypromellose is the most commonly used in hydrophilic matrix fabrication. It allows for controlled release of drug substances, increasing duration of therapeutic effects <sup>[3]</sup>. The physical characteristics of this drug resemble natural tears, providing lubrication to the ocular surface and maintaining corneal hydration in dry eye syndromes <sup>[7]</sup>.

Hypromellose is considered an inert substance as it has no direct pharmacological activity. The viscosity promoting properties of hypromellose prolong the retention time and improve adhesion of synthetic tears to the cornea and conjunctiva. As a result, the tear film breakdown time is prolonged and/or the tear film stability is enhanced. A stable tear film protects the cornea from dryness and epithelial cells <sup>[6]</sup>.

Hypromellose is a methyl and hydroxypropyl mixed ether of cellulose. It is utilized as artificial tears to prevent conjunctival and corneal damage due to impaired lacrimal secretions. It is also used as a visco-elastic promoting agent by maintaining a deep, viscous chamber and allowing for easier manipulation, helping the vitreous surface to be pushed back, thus preventing the formation of a postoperative flat chamber <sup>[5]</sup>.

**Mechanism of action**

Promotes corneal wetting by the stabilization and thickening the precorneal tear film and prolonging the tear film breakdown time, which is usually shortened in dry eye conditions.

Hypromellose also acts to lubricate and protect the eye <sup>[6]</sup>.

The surface active properties of the vehicles found in artificial tears solutions act to stabilize the

In the intact eye, the corneal surface is moistened primarily by the mucin that is produced in the

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application of artificial tear fluid is highly recommended. Both its surface activity and its adsorptive capacity make hypromellose optimal for this use. Hypromellose has a physical-chemical action and leads to, in an aqueous solution, a reduced surface tension as well as an increased level of viscosity. Hypromellose adheres well to the cornea and conjunctiva and provides ample moisture. Irritation symptoms caused by blinking, which occur in the case of tear fluid deficiency, are therefore decreased and symptoms of epithelial desiccation are also alleviated [\[6\]](#).



TARGET	ACTIONS	ORGANISM
<a href="#">Epithelial cell adhesion molecule</a>	Not Available	Humans

**Absorption** Not systemically absorbed [\[6\]](#).

**Volume of distribution** Not Available

**Protein binding** Not Available

**Metabolism** Not Available

**Route of elimination** Not Available

**Half life** Not Available

**Clearance** Not Available

**Toxicity** LD 50 (Rat): > 5 g/kg [\[MSDS\]](#).

Hypromellose is considered low toxicity to non-toxic [\[6\]](#).

Adverse events may include blurred vision and contact dermatitis [\[4\]](#). Hypersensitivity and intolerance reactions may occur (for example, eye burning, pain, increased lacrimation, a sensation of foreign body, conjunctival hyperemia, eyelid swelling, pruritus). The stickiness sensation of the eyelids, the decreased sense of smell, photosensitivity [\[6\]](#).

**Affected organisms** Not Available

**Pathways** Not Available

**Pharmacogenomic Effects/ADRs** [\[i\]](#) Not Available

## INTERACTIONS

**Drug Interactions** [\[i\]](#) Not Available

**Food Interactions** Not Available

## REFERENCES

### General References

- Li CL, Martini LG, Ford JL, Roberts M: The use of hypromellose in oral drug delivery. J Pharm Pharmacol. 2005 May;57(5):533-46. [\[PubMed:15901342\]](#)
- Al-Tabakha MM: HPMC capsules: current status and future prospects. J Pharm Pharm Sci. 2010;13(3):428-42. [\[PubMed:21092714\]](#)
- BION TEARS [\[Link\]](#)



<b>External Links</b>	PubChem Substance	<a href="#">347911105</a>
	Wikipedia	<a href="#">Hypromellose</a>

<b>ATC Codes</b>	<a href="#">S01KA02 — Hypromellose</a>	
	•	<a href="#">S01KA — Viscoelastic substances</a>
	•	<a href="#">S01K — SURGICAL AIDS</a>
	•	<a href="#">S01 — OPHTHALMOLOGICALS</a>
	•	<a href="#">S — SENSORY ORGANS</a>

<b>AHFS Codes</b>	52:13.00* — Artificial Tears
	52:92.00 — EENT Drugs, Miscellaneous
	36:89.00* — Other Diagnostics

<b>MSDS</b>	<a href="#">Download</a> (229 KB)
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CLINICAL TRIALS

**Clinical Trials** ⓘ Show  entries

PHASE	STATUS	PURPOSE	CONDITIONS	COUNT
1	Completed	Treatment	<a href="#">Dry Eye Syndrome (DES)</a>	1
2	Completed	Treatment	<a href="#">Conjunctivitis, Seasonal Allergic</a>	1
2	Completed	Treatment	<a href="#">Eye Dryness</a>	1
2	Completed	Treatment	<a href="#">Macular Edema (ME) / Retinopathy, Diabetic</a>	1
2	Recruiting	Treatment	<a href="#">Herpes Zoster Keratitis</a>	1
2	Recruiting	Treatment	<a href="#">Thyroid Eye Disease</a>	1
2	Terminated	Treatment	<a href="#">Dry Eye Syndromes</a>	1
2, 3	Completed	Treatment	<a href="#">Conjunctivitis, Viral</a>	1
3	Completed	Treatment	<a href="#">Conjunctivitis, Viral</a>	1
3	Completed	Treatment	<a href="#">Exfoliation Syndrome / Glaucoma, Primary Open Angle (POAG)</a>	1

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PHARMACOECONOMICS

<b>Manufacturers</b>	Not Available
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<b>Packagers</b>	Not Available
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**Dosage forms** Show  entries

FORM	ROUTE	STRENGTH
Solution	Ophthalmic	.32 %
Solution	Ophthalmic	
Liquid	Ophthalmic	
Solution	Ophthalmic	0.3 %
Solution	Oral	18 mg/1mL
Solution	Ophthalmic	3 mg

FORM	ROUTE	STRENGTH
Gel	Ophthalmic	0.3 %

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Liquid	Ophthalmic	0.003 L/TL
Gel	Ophthalmic	

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**Prices** Not Available

**Patents** Not Available

## PROPERTIES

**State** Not Available

### Experimental Properties

PROPERTY	VALUE	SOURCE
water solubility	Soluble	<a href="https://www.sigmaaldrich.com/catalog/product/usp/1330005?lang=en&amp;ion=CA">https://www.sigmaaldrich.com/catalog/product/usp/1330005?lang=en&amp;ion=CA</a>

**Predicted Properties** Not Available

**Predicted ADMET features** Not Available

## SPECTRA

**Mass Spec (NIST)** Not Available

**Spectra** Not Available

## TAXONOMY

**Classification** Not classified

## TARGETS

### 1. Epithelial cell adhesion molecule

[Details](#)

<b>Kind</b>	Protein
<b>Organism</b>	Humans
<b>Pharmacological action</b>	<span style="border: 1px solid black; padding: 2px;">Unknown</span>
<b>General Function</b>	Protein complex binding
<b>Specific Function</b>	May act as a physical homophilic interaction molecule between intestinal epithelial cells (IECs) and intraepithelial lymphocytes (IELs) at the mucosal epithelium for providing immunological barrier...
<b>Gene Name</b>	EPCAM
<b>Uniprot ID</b>	<a href="#">P16422</a>
<b>Uniprot Name</b>	Epithelial cell adhesion molecule
<b>Molecular Weight</b>	34932.005 Da

References

1. Geerling G, Daniels JT, Dart JK, Cree IA, Khaw PT: Toxicity of natural tear substitutes in a fully defined culture model of human corneal epithelial cells. Invest Ophthalmol Vis Sci. 2001 Apr;42(5):948-56. [PubMed:11274071]

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Drug created on December 03, 2015 09:51 / Updated on April 22, 2019 17:13

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