SSO-001(Knee osteoarthritis treatment drug): Summary

SSO-001 may act as a disease-modifying drug and relieves OA associated symptoms, completed Phase IIa clinical study.

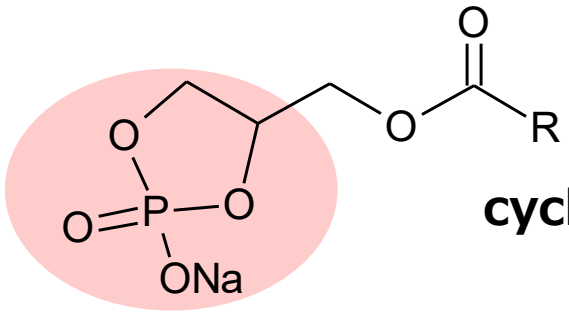
SSO-001 is a first-in-class phospholipase autotaxin (ATX) inhibitor that may act as a disease-modifying drug and relieves OA associated symptoms. ATX is a secreted lysophospholipase D widely present in biological fluids that catalyzes the conversion of lysophosphatidylcholine (LPC) to lysophosphatidic acid (LPA). LPA is a pluripotent lipid mediator acting through plasma membrane-associated LPA receptors and via intracellular receptor peroxisome proliferator-activated receptor gamma (PPARγ), ultimately leading to the stimulation of nociception, cell proliferation, migration, and cytokine and matrix metalloproteinase (MMP) production. Increased levels of ATX and LPA have been found in synovial fluids, inflammatory site, and synovial fibroblasts isolated from animal models and OA patients, suggesting the potential role of ATX and LPA in the pathogenesis of OA.

SANSHO Development Pipeline

	Non-clinical to Pre-clinical	Phase I	Phase II
Orthopedics		SSO-001 (OA*)	
Respiratory Medicine	SSI-002 (IPF**)		
Ophthalmology	SSG-003 (Glaucoma)		
Dermatology	SSD-004 (Scleroderma) SSH-005 (Hypotrichosis)		

*Osteoarthritis
**Idiopathic pulmonary fibrosis

Conversion of cPA to chemically stable derivatives

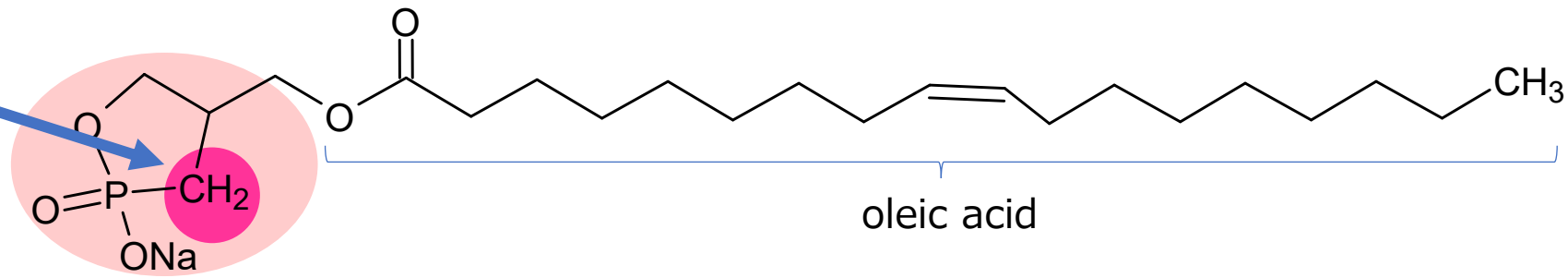


Various fatty acids such as linoleic acid, palmitic acid, and oleic acid

cyclic Phosphatidic **Acid** (cPA, R=C:16~22)

Improved in vivo stability by converting oxygen (O) to methylene (CH_2)

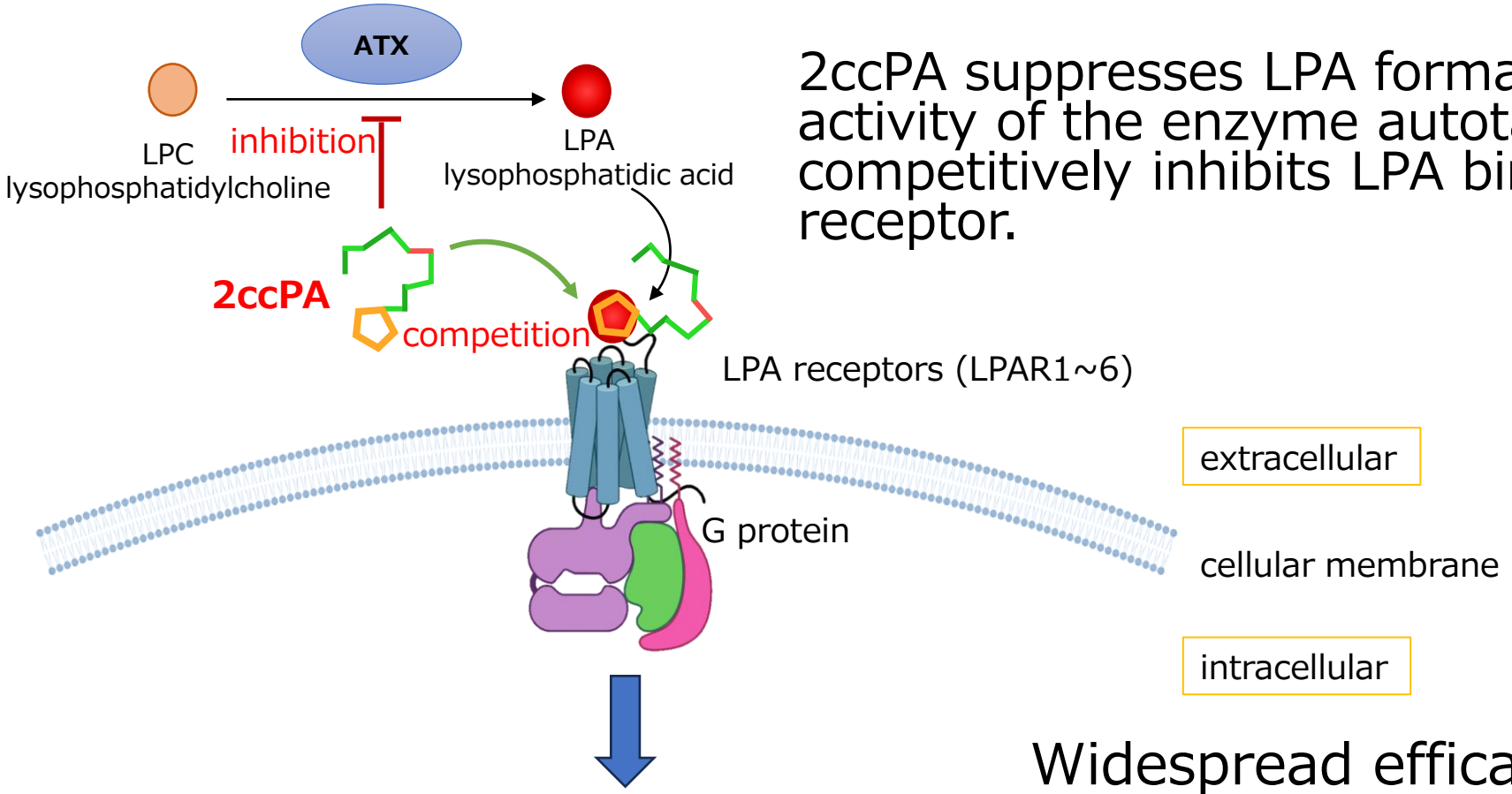
Conversion to chemically stable derivative



2-carba-cyclic phosphatidic acid (2ccPA)

Oleic acid is selected as the fatty acid

Unique mechanism of action of 2ccPA



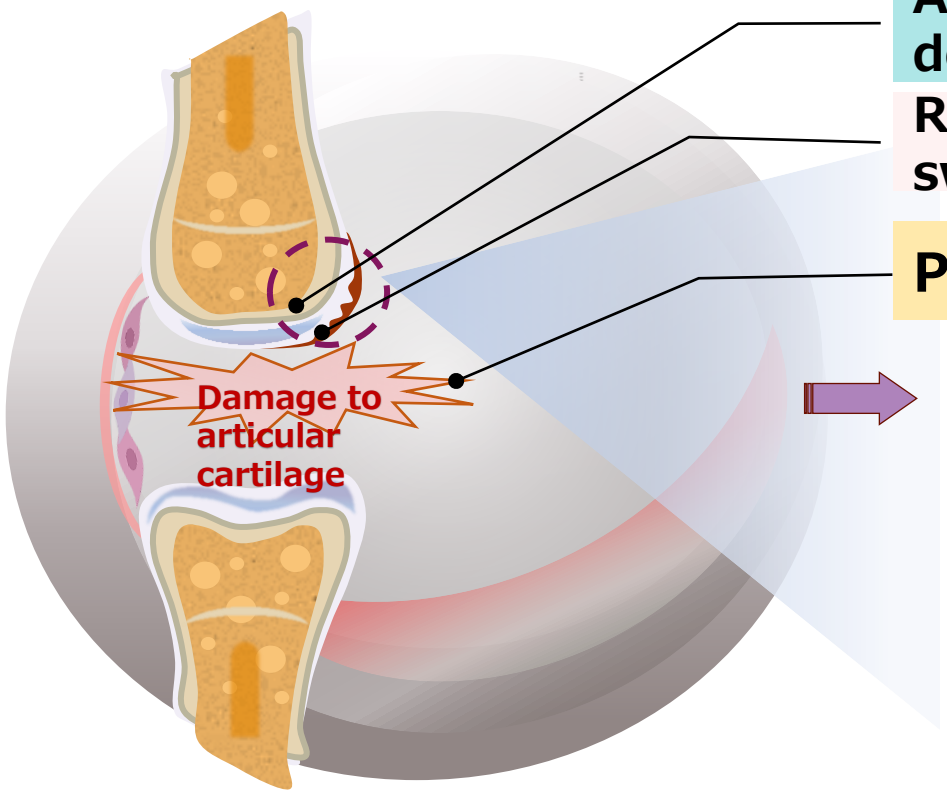
2ccPA suppresses LPA formation by inhibiting the activity of the enzyme autotaxin (ATX) and competitively inhibits LPA binding to the LPA receptor.

Widespread efficacy in diseases caused by inflammation

Development of a treatment for osteoarthritis (OA) (SSO-001)

What is osteoarthritis?

A disease in which the cartilage that cushions the joints wears away due to aging or loss of muscle mass, resulting in pain.

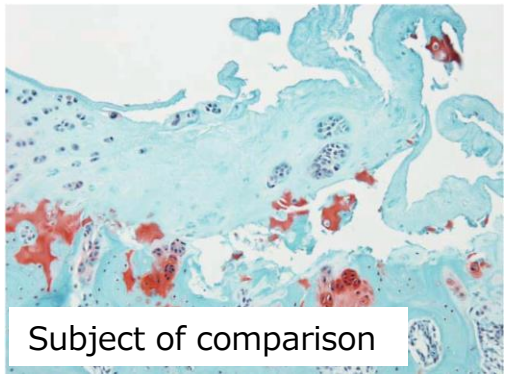


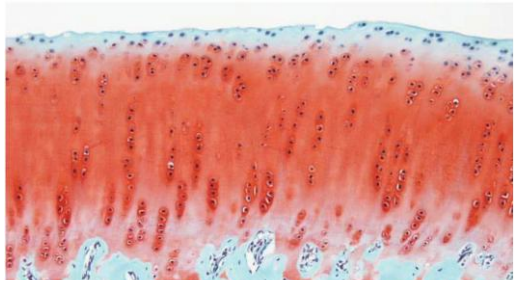
Alleviates cartilage degeneration

Reduces joint swelling

Pain relief

Pharmacological effects of SSO-001 (2ccPA)





Example of SSO-001 (2ccPA) administration

Rabbit animal model experimental results

Inhibits destruction of cartilage tissue

SSO-001: Status of clinical studies

Area	Study#	Period	Phase	Target Patients	Number of subjects (Dosage)	Administration	Primary endpoints	Status
Taiwan	OEP-2PM102-101	FRB18 (FSFV) ～ MAY21 (DBL)	Ib	Knee osteo-arthritis patients	6 (50 μg) 12 (200 μg) 6 (800 μg) 6 (2,400 μg) 10 (Placebo)	Single intra-articular injection	Safety	Completed
Taiwan	OEP-2PM102-201	NOV22 (FSFV) ～ OCT24 (DBL)	Ib (additional)	Knee osteo-arthritis patients	6 (4,800 μg) 6 (7,200 μg) 4 (Placebo)	Single intra-articular injection	Safety	Completed
			IIa	Knee osteo-arthritis patients	32 (2,400 μg) 30 (4,800 μg) 31 (7,200 μg) 30 (Placebo)	Intra-articular injection every 2 weeks (x3)	Efficacy and safety	Completed

SSO-001: New Disease-Modifying OA Drugs (DMOADs)

- LPA signaling has been shown to be closely involved in joint inflammation, cartilage degeneration, subchondral bone remodeling, and especially in the development of neuropathic pain.
- Preclinical studies have strongly indicated that modulation of LPA receptors is a promising therapeutic strategy, suggesting its potential as new disease-modifying OA drugs (DMOADs).

SSO-001: Potential for “First in Class”