

Targeting Sterol Transporters In Metabolic Disease

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SUMMARY

UCLA researchers in the Department of Pathology have characterized a novel mechanism of cholesterol transport in mammalian cells between plasma membrane the ER. It is nonvesicular, lysosome independent and critical for lipid homeostasis.

BACKGROUND

Metabolic diseases that involve metabolism of lipids, such as cholesterol, are typically inherited and can lead to dangerous amount of lipid build-up over time. This is because the body lacks working enzymes that can break down lipids and convert them to energy. The lipid build-up eventually damages vital organs such as the brain, liver and the peripheral nervous system. Treatments for these disorders are limited to enzyme placements, blood transfusions and other procedures. Current genetic screening and enzyme replacements for these diseases are limited to known mechanisms of lipid uptake and metabolism.

INNOVATION

A novel mechanism of cholesterol transport in mammalian cells have been characterized. This mechanism involves the family of Aster proteins that reside in the endoplasmic reticulum (ER). They harbor a previously uncharacterized lipid binding domain that allows them to shuttle cholesterol from the lipid rich plasma membrane to the ER. This cholesterol transport mechanism is nonvesicular and lysosome independent. This novel finding adds Aster proteins to the list of genetic screenings and enzyme replacement therapies for metabolic disorders.

APPLICATIONS

- ▶ Adrenal diseases
- ▶ Lipid metabolic disorders

ADVANTAGES

- ▶ Can be targetable
- ▶ Can be screened
- ▶ Direct transport of cholesterol
- ▶ Critical for lipid homeostasis

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20210255205	08/19/2021	2018-354

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Transgenic Mouse Model of Liver LDL Receptor Deficiency](#)

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OTHER INFORMATION

KEYWORDS

lipid metabolism; cholesterol transport; aster proteins; lipid transport; HDL

CATEGORIZED AS

- ▶ **Medical**
- ▶ Disease: Metabolic/Endocrinology

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