KDDF
Korea Drug Development Fund

Asset #5
Duke-NUS Medical School

Furin as a Novel Pro Atherogenic Gene

Therapeutic Area	Cardiovascular Disease	**Indications**	Coronary Artery Disease (CAD)
Modality	Gene Therapy	**Development Stage**	Target Identification/Validation

Overview

Background

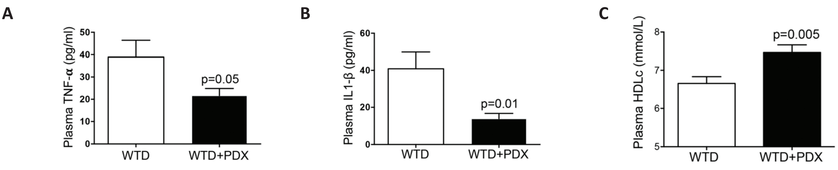
- Atherosclerotic coronary artery disease (CAD) is the primary cause of ischemic heart disease, and a leading cause of death worldwide.
- Currently available treatment strategies aim to reduce risk factors via lifestyle changes, decrease low density lipoprotein cholesterol (LDL-C) via statins and proprotein convertase subtilisin/kexin type 9 (PCSK-9) inhibitors, blood pressure surveillance, antithrombotic and anti-inflammatory drugs, and surgical interventions.
- However, mortality due to CAD remains high. Therefore, additional mechanism-based therapies are urgently needed to target atherosclerotic CAD more directly.

Technology Advantages

- **Reduced Inflammation**: Blocking FURIN reduces the migration of inflammatory cells and lowers the expression of inflammation-related genes in cells lining blood vessels.
- **Stable Plaques**: FURIN inhibition decreases the presence of immune cells and collagen within plaques, making them more stable and less likely to rupture.
- **Systemic Anti-Inflammation**: FURIN inhibition results in lower levels of inflammation markers throughout the body, reducing the risk of cardiovascular issues.
- **Protection from Vascular Changes**: Blocking FURIN guards against harmful changes in blood vessel structure and content, which contribute to atherosclerosis.

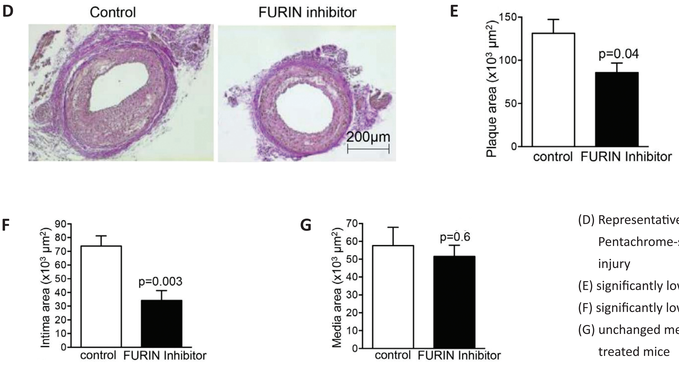
Key Data

Inhibiting FURIN reduces systemic inflammation in mice and results in elevated plasma HDL-cholesterol levels



Lower plasma levels of (A) TNF (tumor necrosis factor)-α, (B) IL1 (interleukin 1)-β, and (C) elevated plasma HDLc levels in FURIN inhibitor–treated mice. n=14–16 for all analyses

FURIN inhibition reduces neointimal plaque formation and inflammation in a wire injury model of atherosclerosis



(D) Representative photomicrographs of Pentachrome-stained sections 2 week after injury
(E) significantly lower plaque area
(F) significantly lower neointima area
(G) unchanged media area in FURIN inhibitor–treated mice

IP Status & Publication(s)

Intellectual Property

Patent Number
-

Patent Family
-

Publication(s)

- Yakala at al. (2019). FURIN inhibition reduces vascular remodeling and atherosclerotic lesion progression in mice. Arteriosclerosis, Thrombosis, and Vascular Biology