A Zebrafish Model Of Atherosclerosis

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Technology description

Summary

Heart attack and stroke are clinical consequences of atherosclerosis, an inflammatory disease of arteries initiated by lipid accumulation in the artery wall. Current animal models for atherosclerosis primarily use Apolipoprotein E (ApoE) and low density lipoprotein receptor (LDLR) knockout mice, or hyperlipidemic rabbits.. Although these models are useful once lead compounds are being tested, early assessment of new drug candidates is impractical due to the cost, slow throughput, limitations of post mortem analysis of lesions, and poor in-vivo imaging technologies that typically require use of radioactive tracers. An animal model that could provide reasonably high throughput, where the development of atherosclerotic lesions or their regression can be easily monitored while the animal is still alive, would provide significant improvement in the ability to obtain physiological information about early stage candidate compounds.

Description

UCSD researchers have developed a novel zebrafish model useful for studying mechanisms of accumulation of lipid in blood vessel walls and associated vascular inflammation. This model uses a special diet enriched with cholesterol and/or knockdown of zebrafish ApoE (homologous to human and mouse ApoE) to trigger lipid accumulation in the blood vessels and atherosclerosis The vessels and lipids are easily visualized in the transparent zebrafish due to fluorescent (green) vasculature and fluorescently (red) labeled cholesterol. The model has been tested with a cholesterol lowering drug and validated for reducing cholesterol accumulation and vascular damage when the drug is present.

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