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About OMICS International Conferences

OMICS International is a pioneer and leading science event organizer, which publishes around 500 open access journals and conducts over 500 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

HDL Signaling in Macrophages and its role in atherosclerosis protection

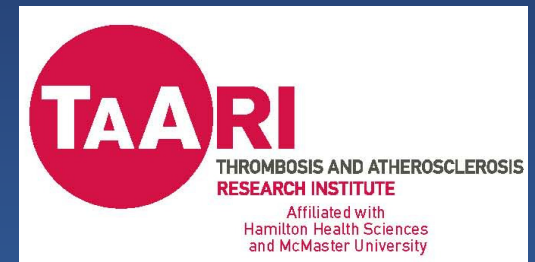
Bernardo Trigatti

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Thrombosis and Atherosclerosis Research Institute

McMaster University

Hamilton, Canada



3rd International Conference on Integrative Biology

August 5, 2015, Valencia, Spain

Acknowledgements



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Funders

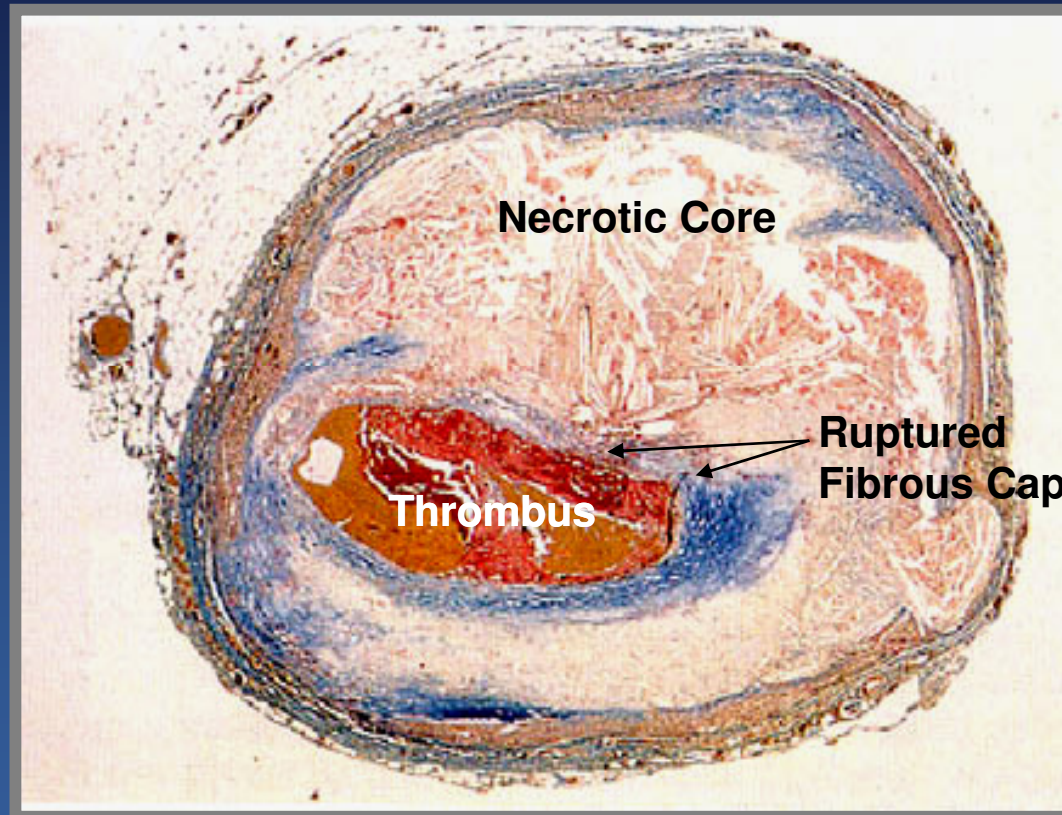


Canadian Institutes
of Health Research



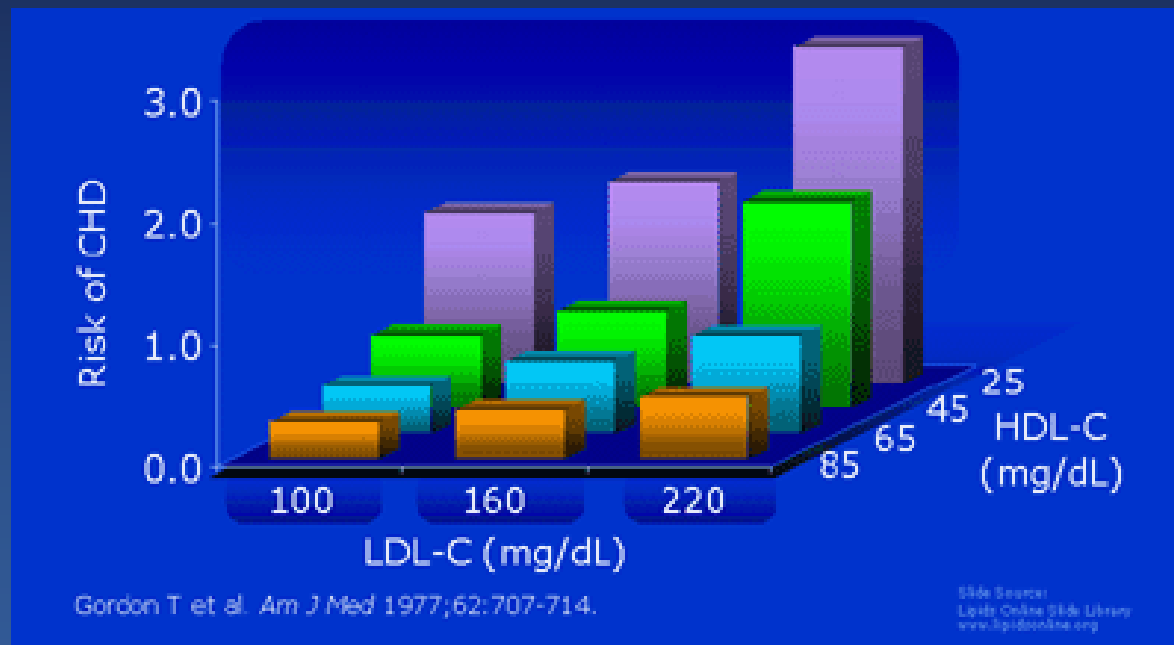
Heart and Stroke
Foundation of Canada

Atherosclerosis

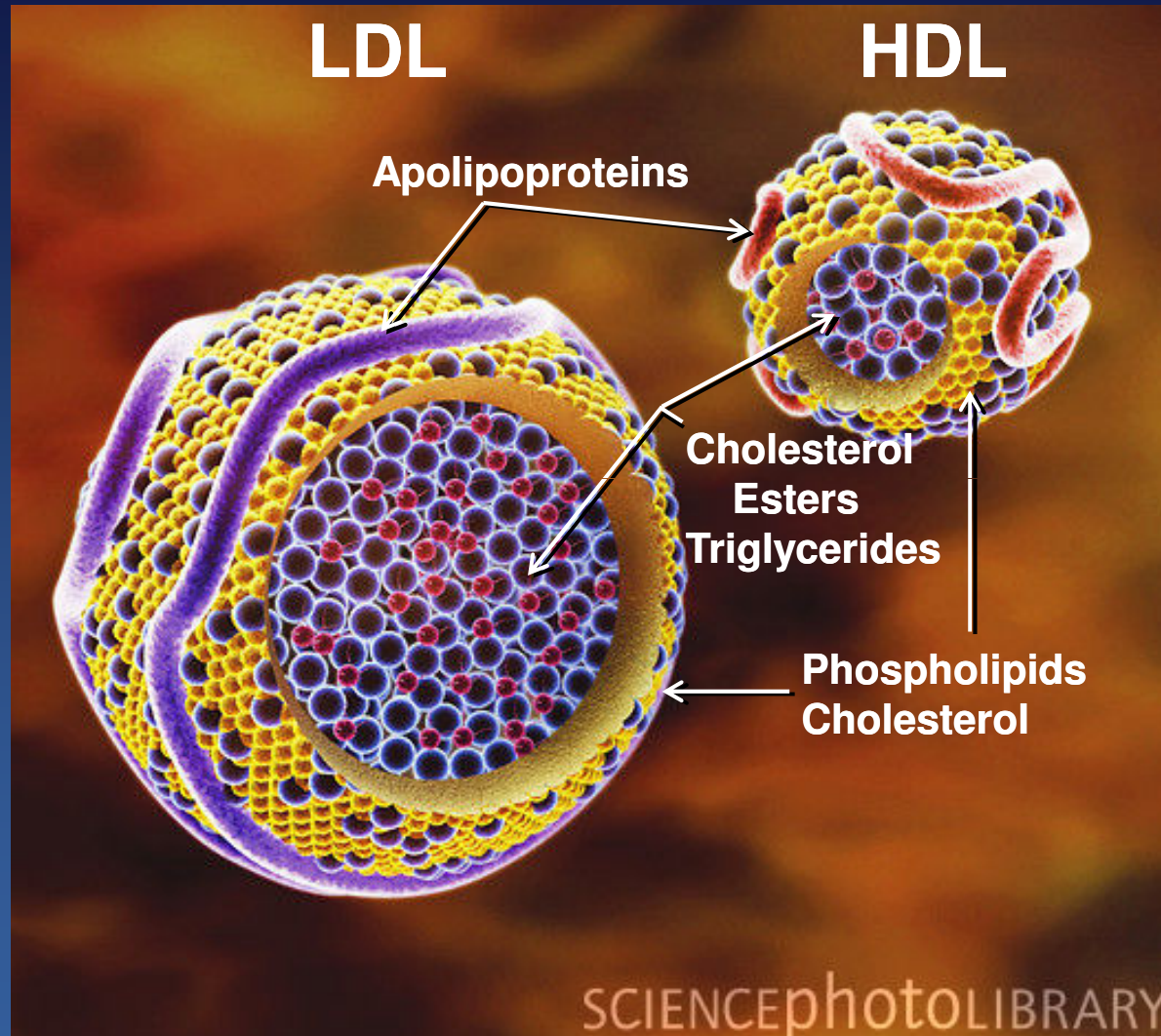


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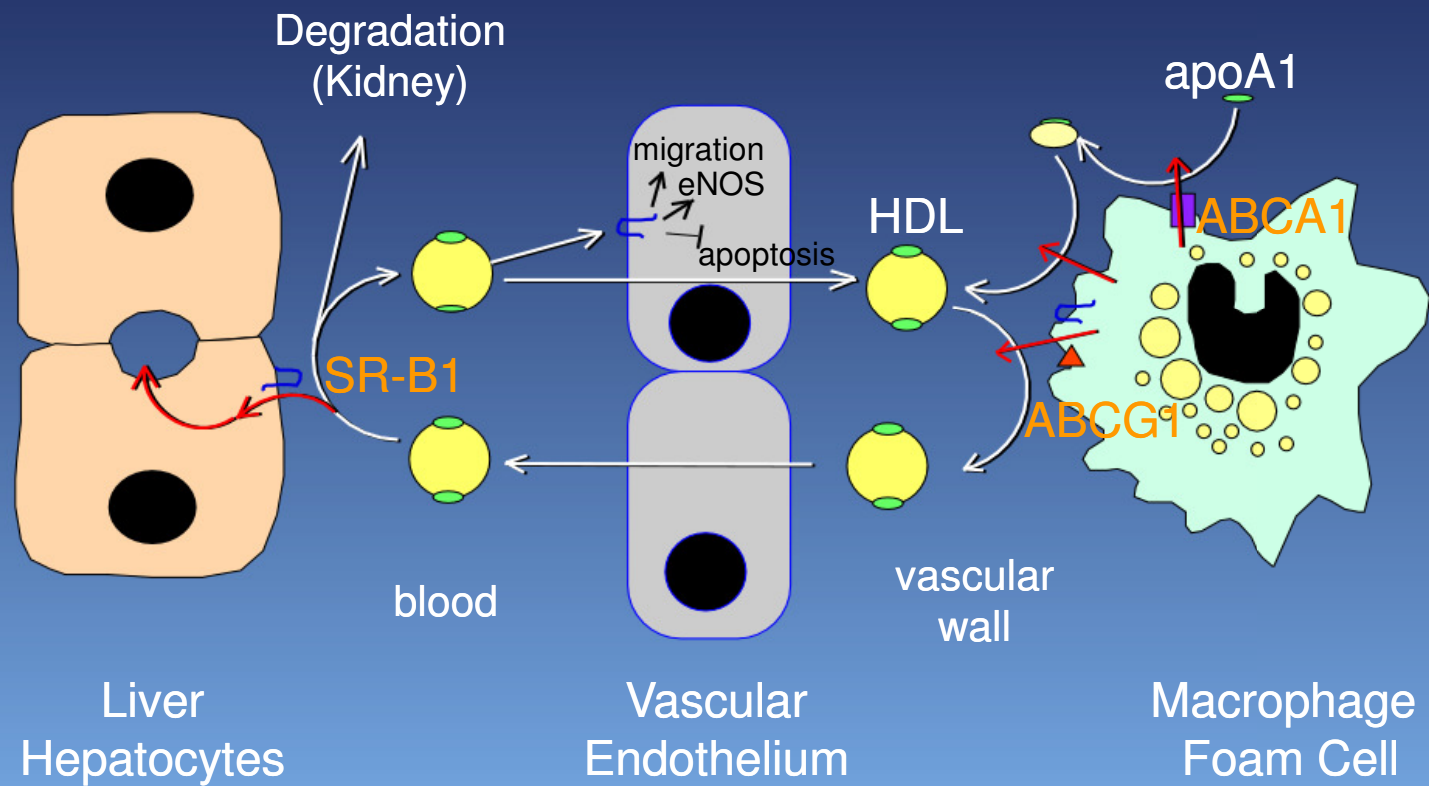
Heart disease risk versus LDL and HDL-cholesterol levels



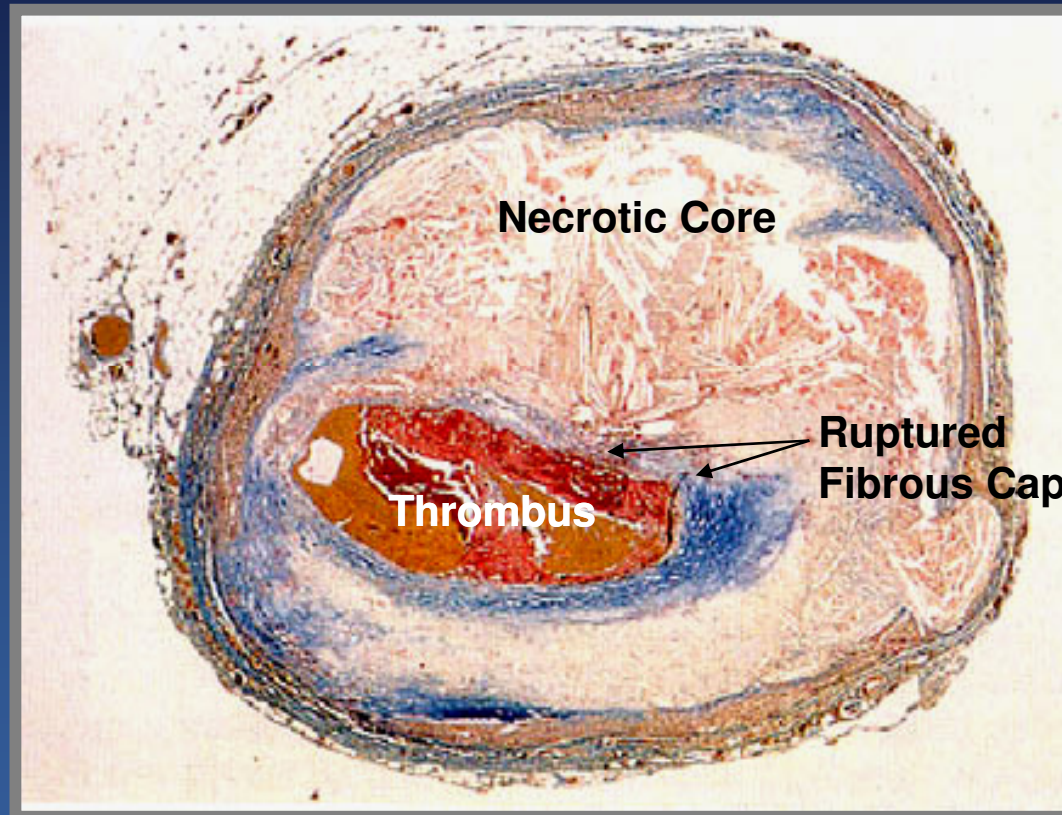
Low and High Density Lipoproteins



HDL: Reverse cholesterol transport and signaling



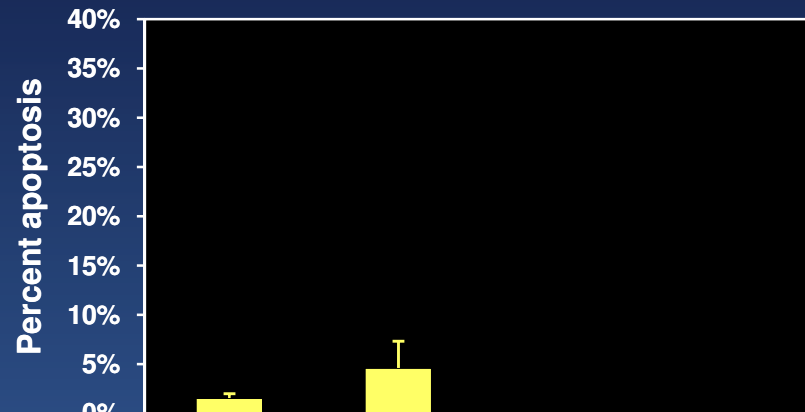
Atherosclerosis



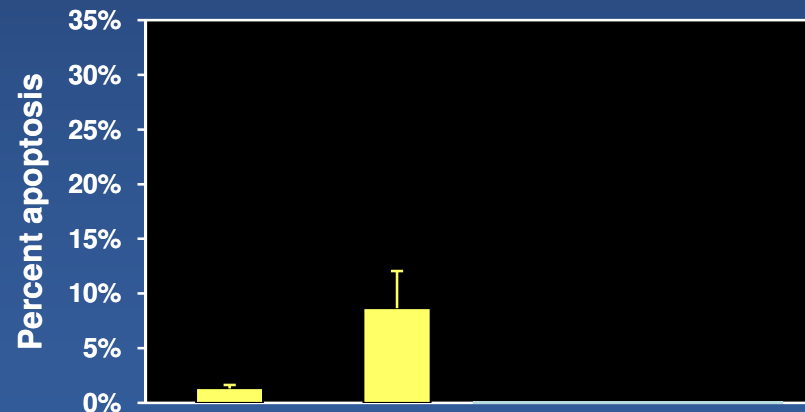
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Macrophages resist ER-stress induced apoptosis...

Annexin V



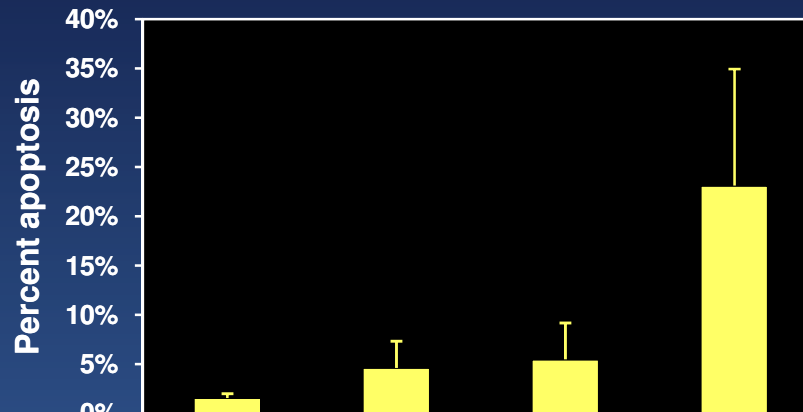
TUNEL



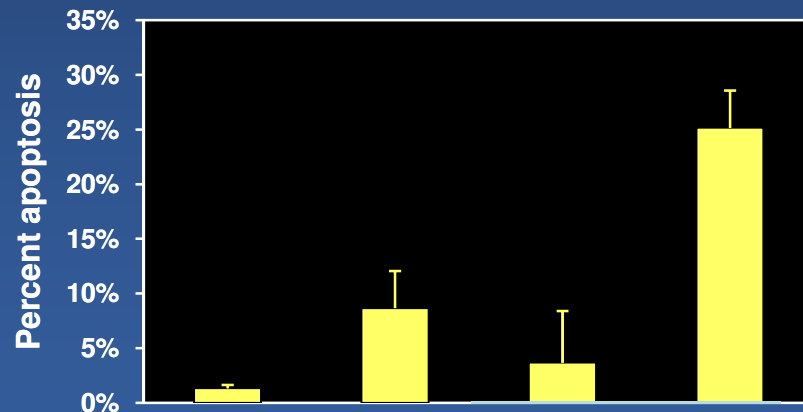
Thapsigargin	-	+
Serum	Newborn Calf	

Macrophages resist ER-stress induced apoptosis ... but become sensitive when lipoproteins are removed from serum

Annexin V

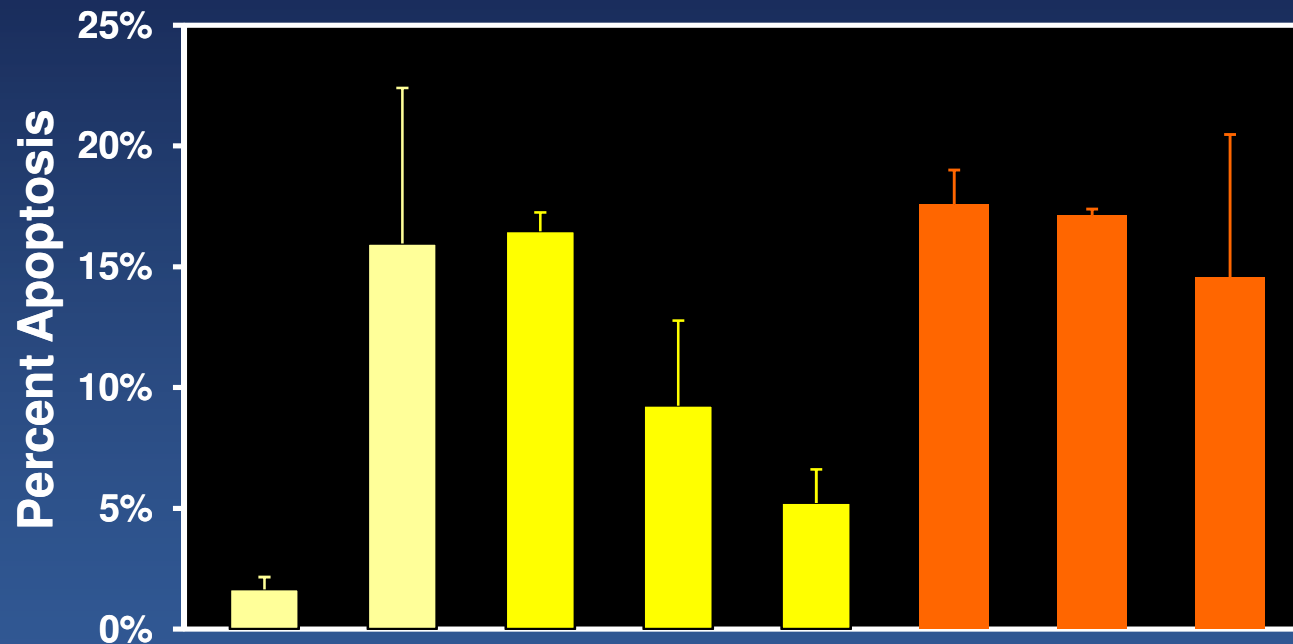


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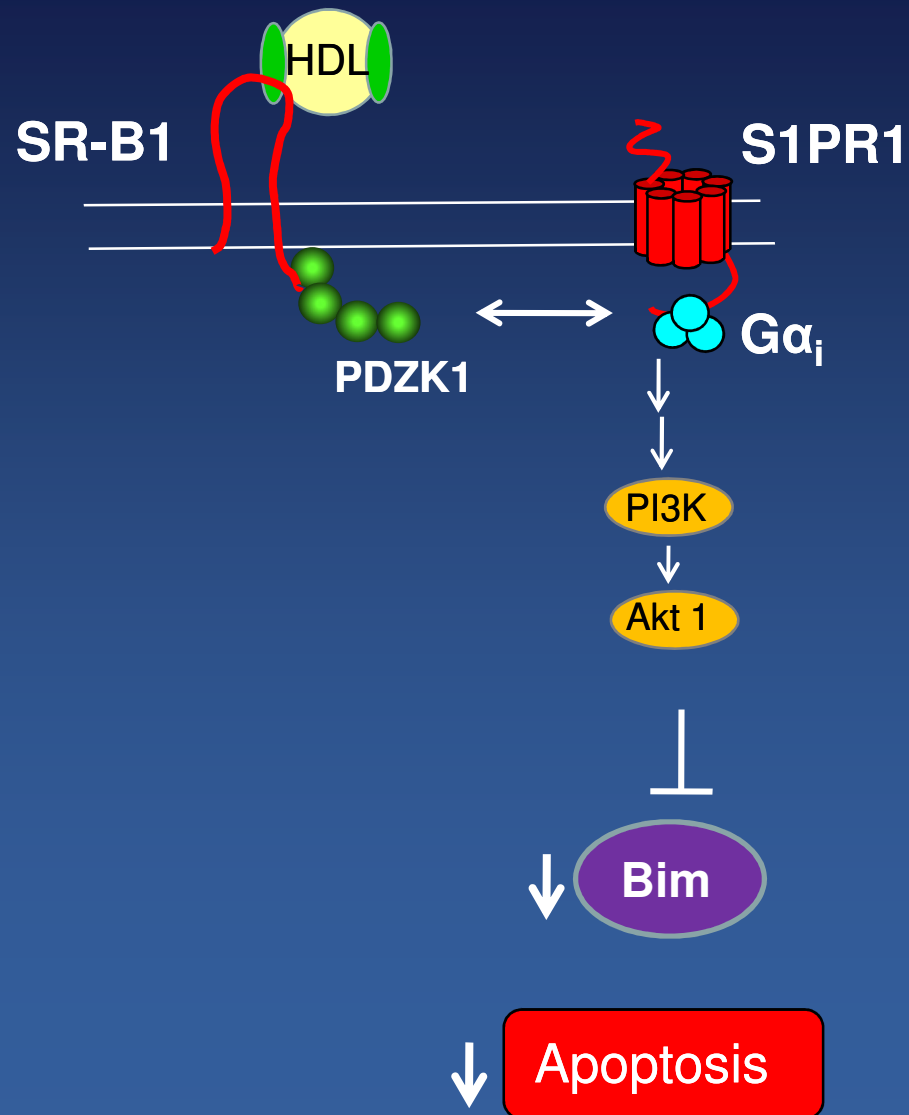
Thapsigargin	-	+	-	+
Serum	Newborn Calf		Newborn Calf Lipoprotein Deficient	

HDL but not LDL suppresses ER-stress induced apoptosis in macrophages



HDL (μg/ml)	0	0	12.5	25	50	0	0	0
LDL (μg/ml)	0	0	0			12.5	25	50
Tunicamycin	-	+						

HDL signaling in macrophages

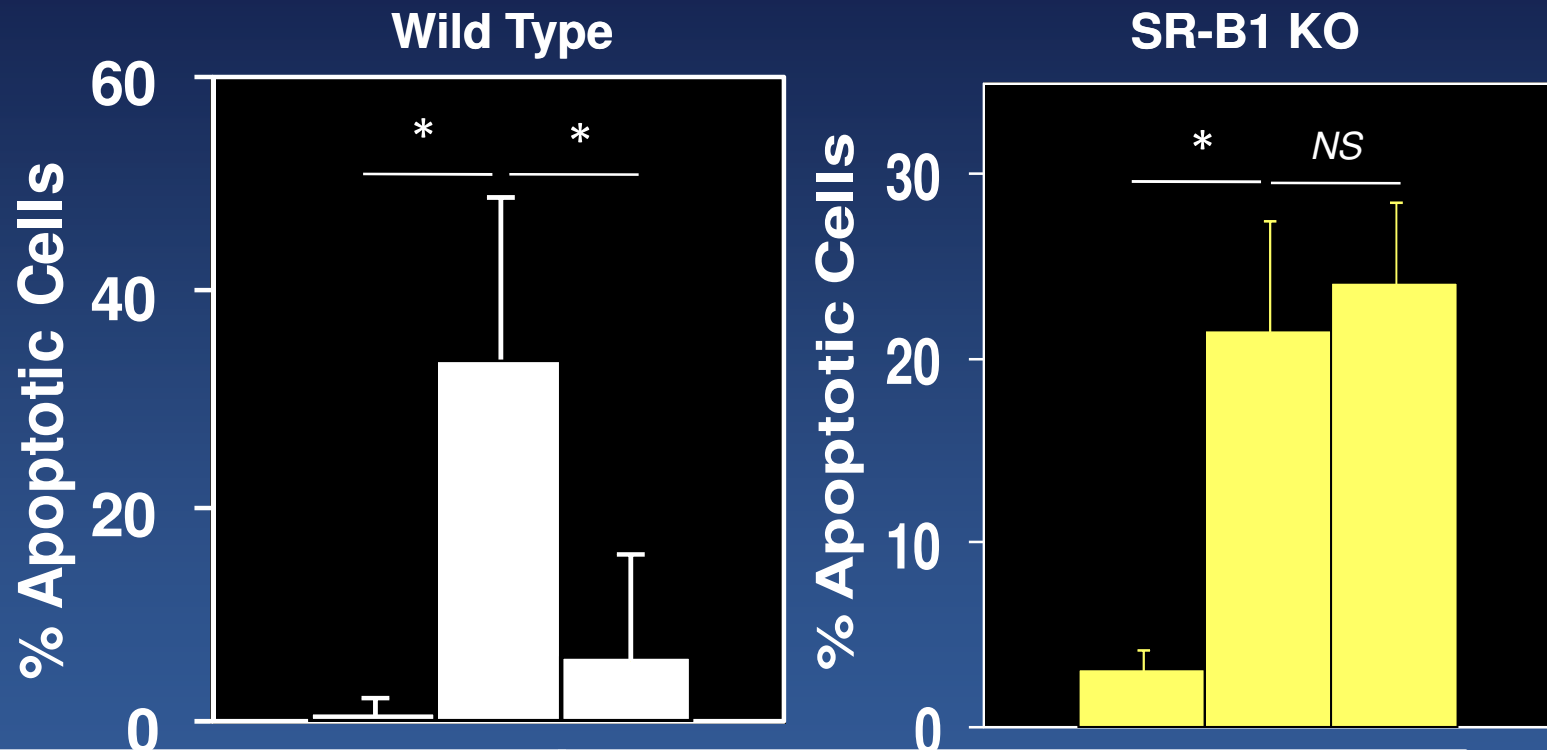


Necrotic core
Plaque instability

HDL treatment of macrophages reduces levels of the pro-apoptotic factor Bim

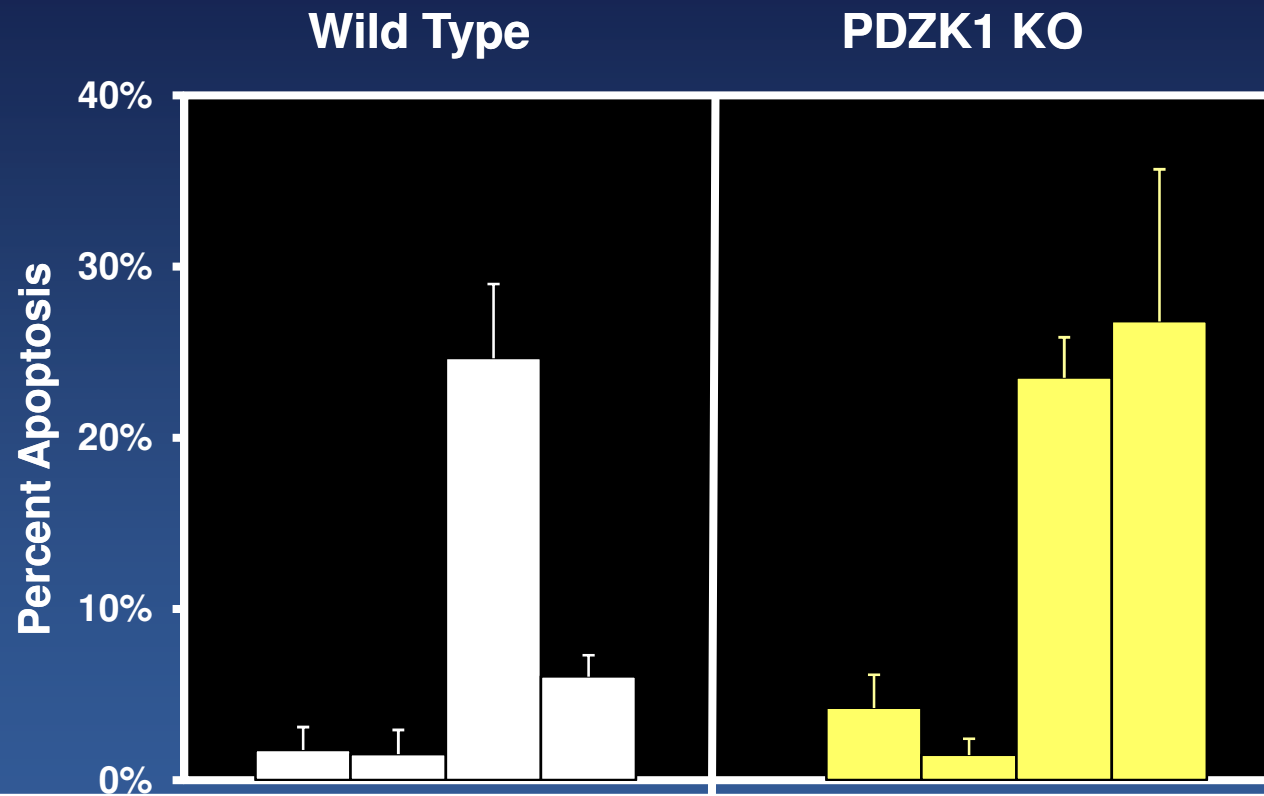


HDL mediated suppression of ER stress-induced apoptosis requires SR-B1



Free Chol Load	-	+	+		-	+	+
HDL	-	-	+		-	-	+

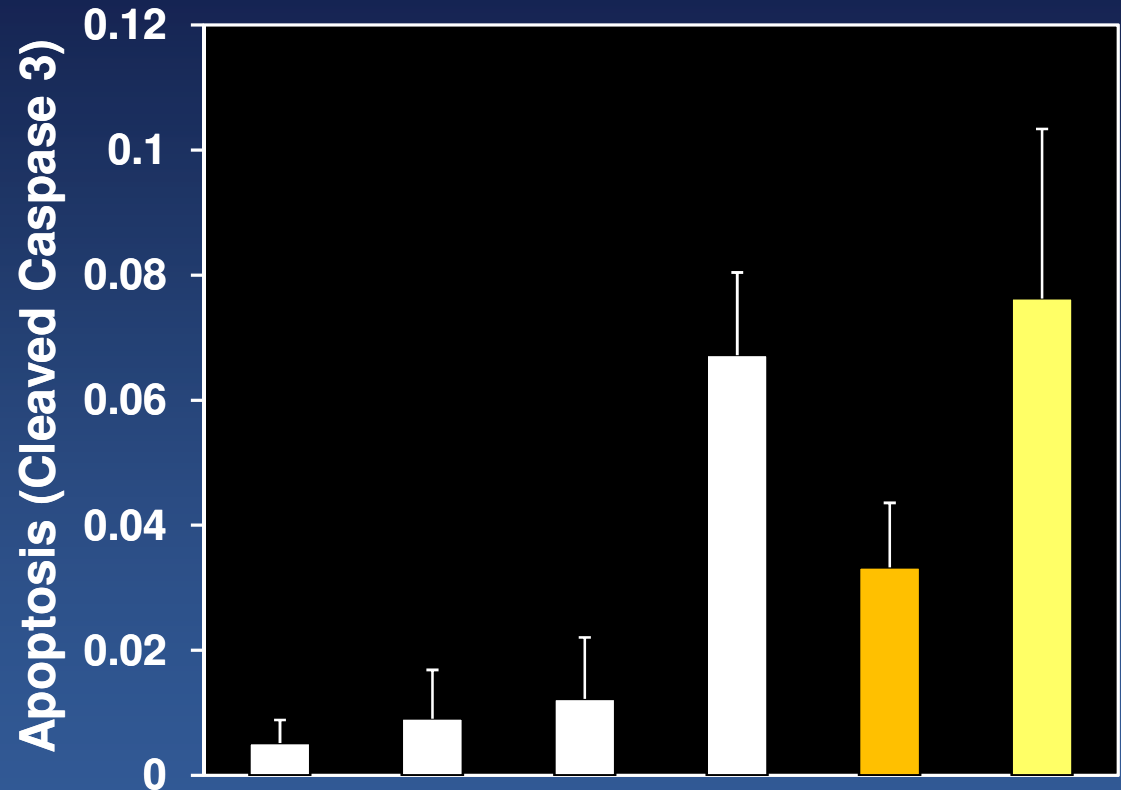
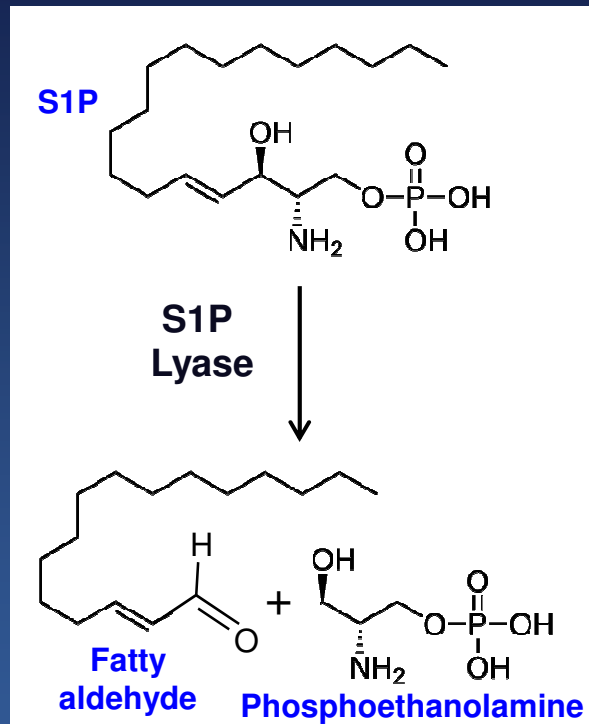
HDL is unable to suppress ER stress-induced apoptosis in the absence of PDZK1



Tunicamycin	-	-	+	+	-	-	+	+
HDL	-	+	-	+	-	+	-	+

S1P is required for HDL mediated protection of macrophages from apoptosis

S1P Lyase Reaction

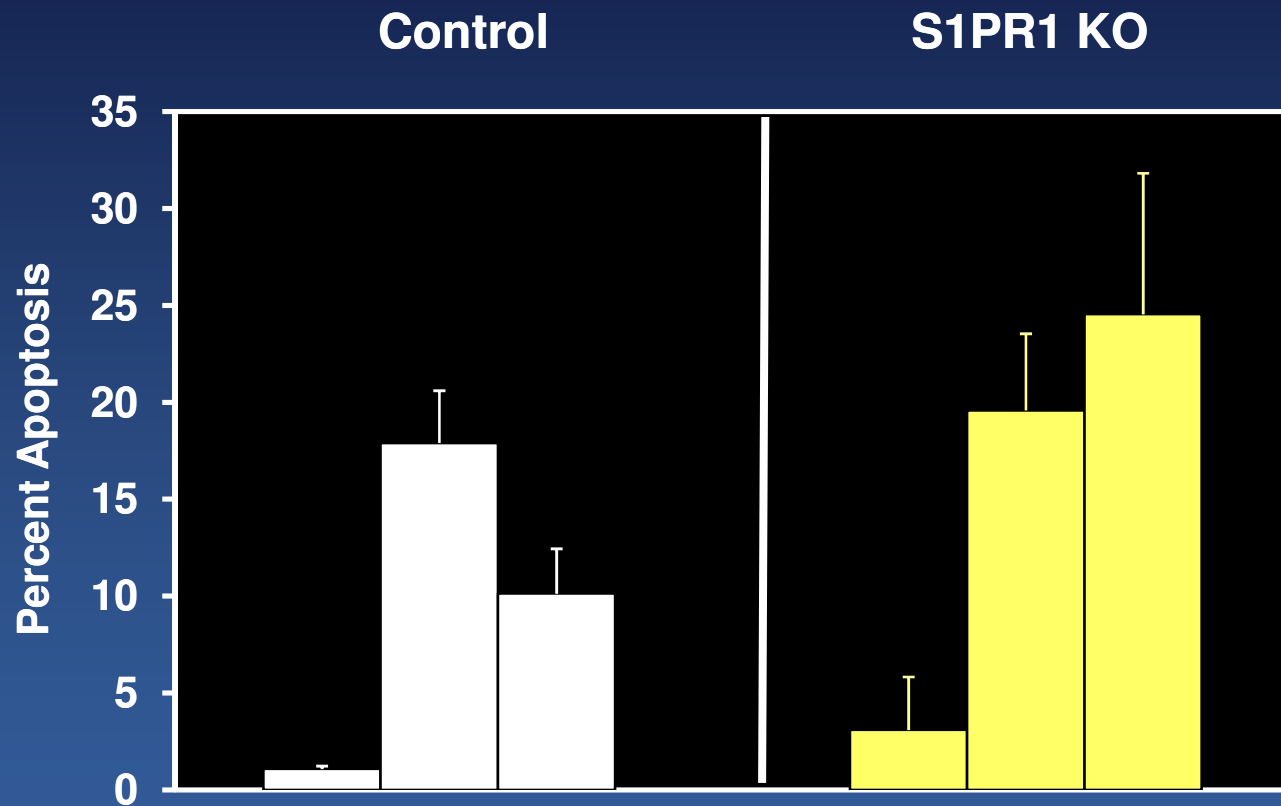


Pei Yu

Leticia Gonzalez

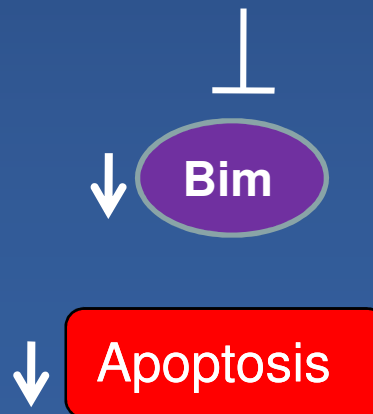
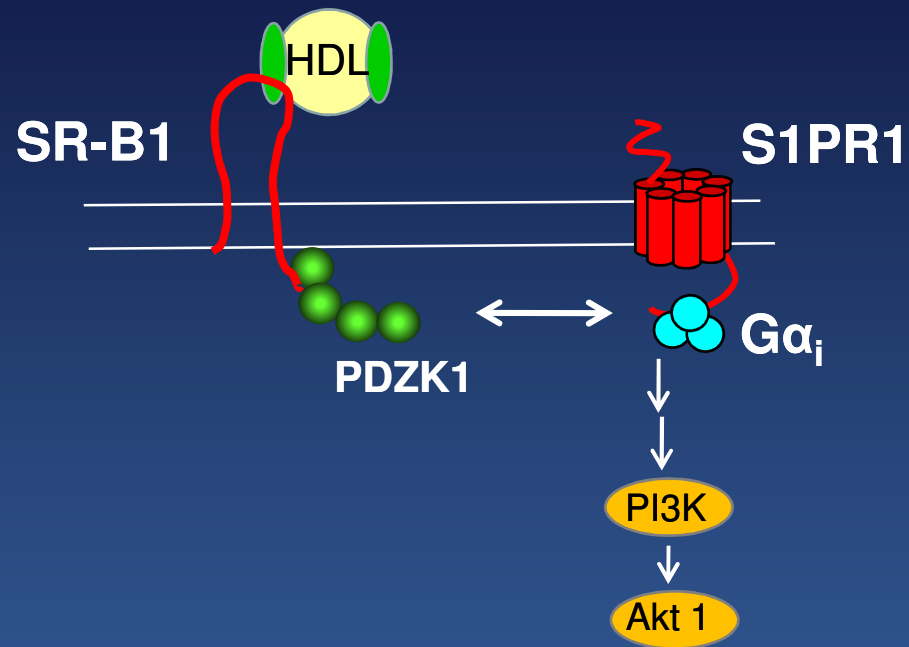
Tunicamycin	-	-	-	+	+	+
Control Treated HDL	-	+	-	-	+	-
S1P-Lyase Treated HDL	-	-	+	-	-	+

Knockout of S1PR1 in macrophages reduces HDL mediated protection against ER-stress induced apoptosis



Tunicamycin	-	+	+		-	+	+
HDL	-	-	+		-	-	+

HDL signaling in macrophages



Necrotic core
Plaque instability

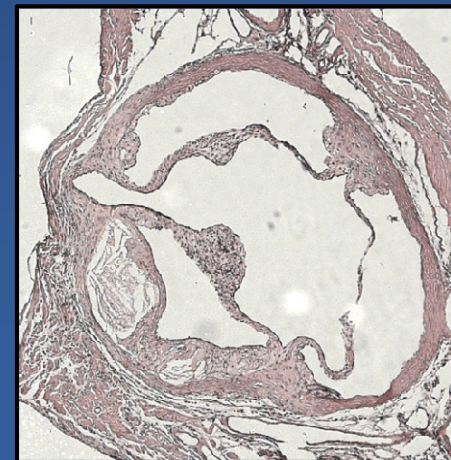
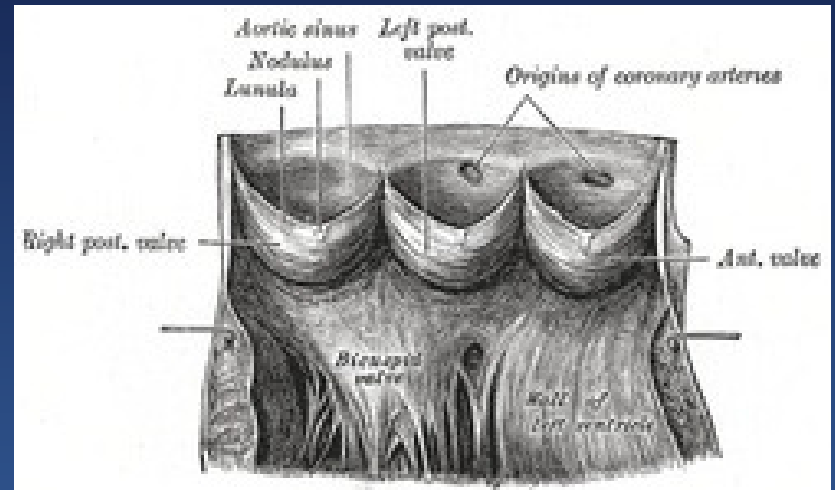
Measurement of atherosclerosis in mice

Aortic Sinus

Top



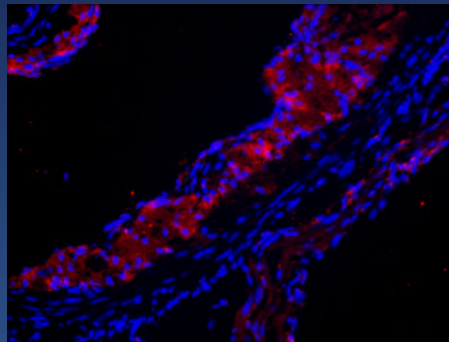
Cut Away



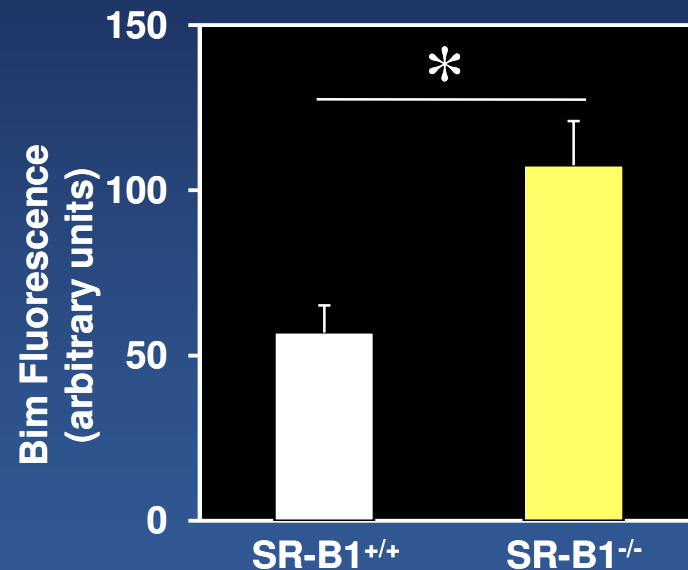
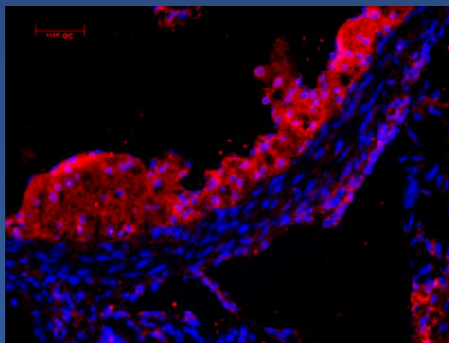
Increased Bim immunofluorescence in atherosclerotic plaques of mice lacking SR-B1 in bone marrow derived cells

Bone Marrow

SR-B1^{+/+}



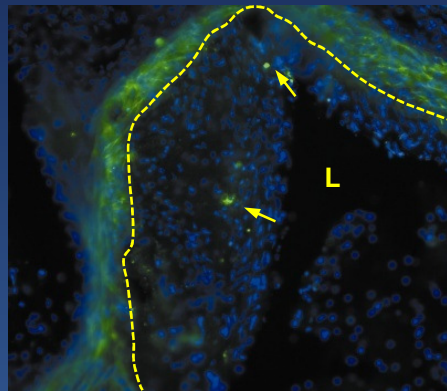
SR-B1^{-/-}



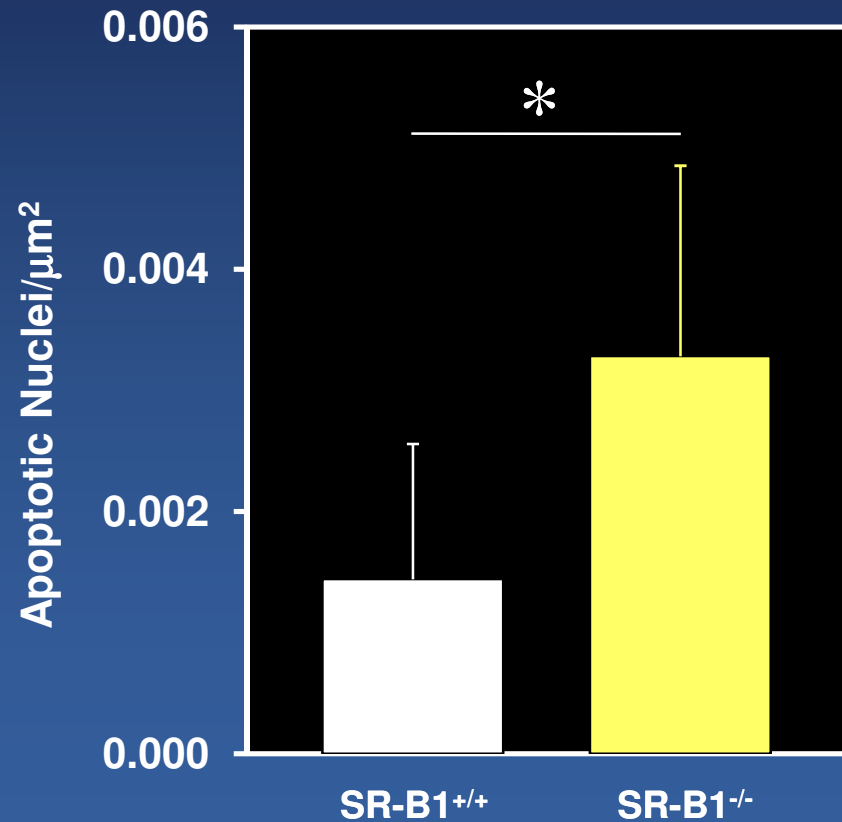
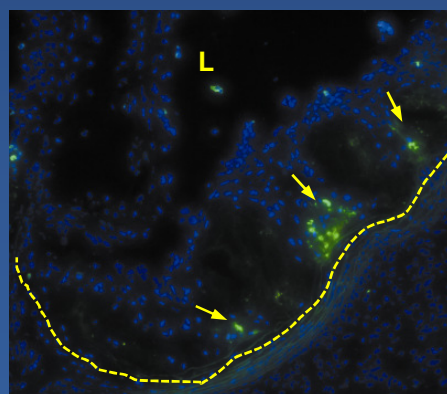
Increased apoptosis in atherosclerotic plaques of mice lacking SR-B1 in bone marrow derived cells

Bone Marrow

SR-B1^{+/+}



SR-B1^{-/-}



Apoptosis

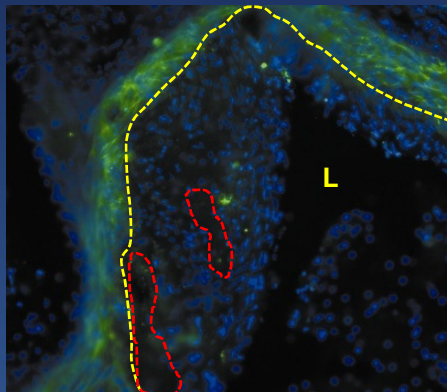
Nuclei

Yi Zhang, Aishah Al-Jarallah

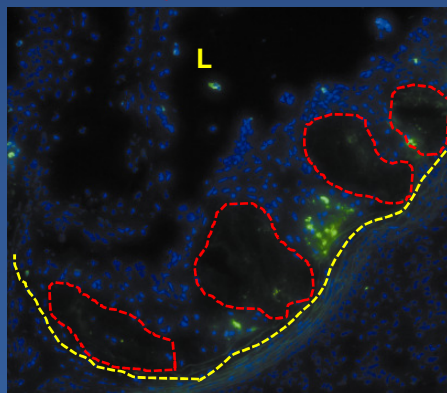
Increased necrotic core size in atherosclerotic plaques of mice lacking SR-B1 in bone marrow derived cells

Bone Marrow

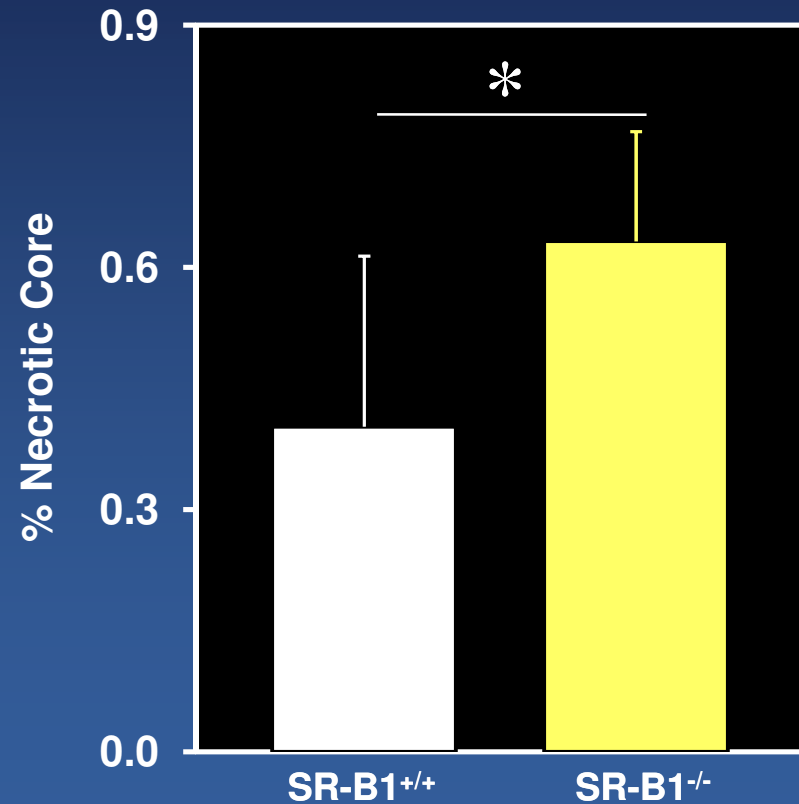
SR-B1^{+/+}



SR-B1^{-/-}



Necrotic Core Size

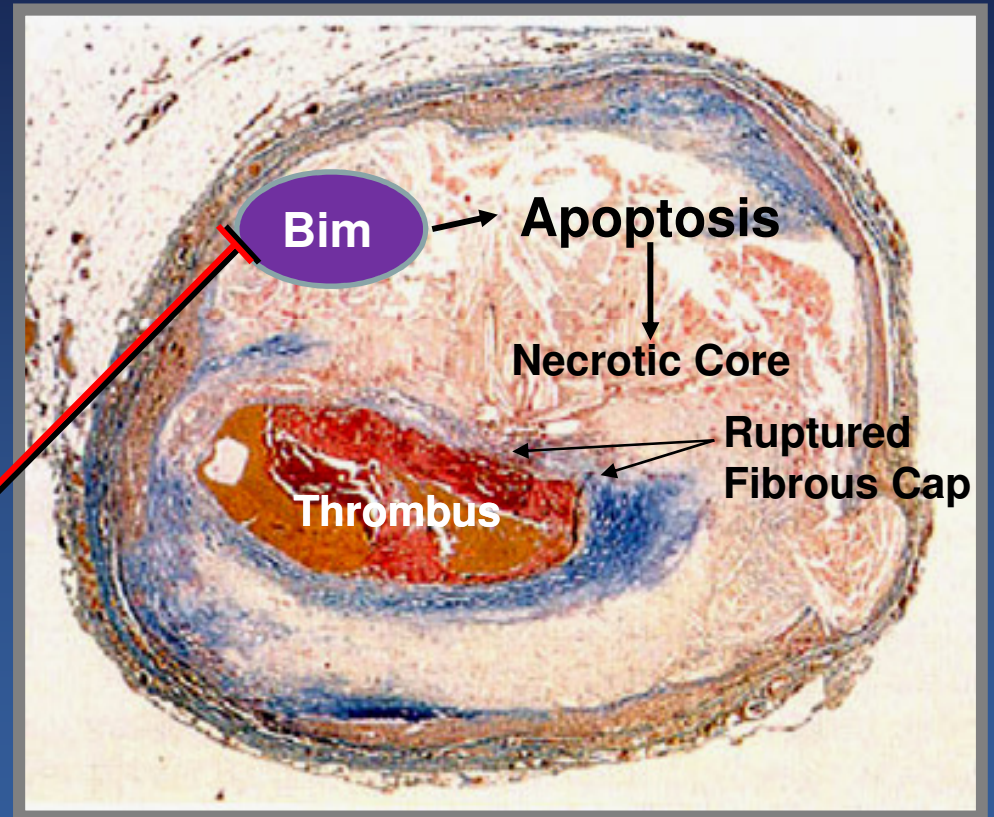
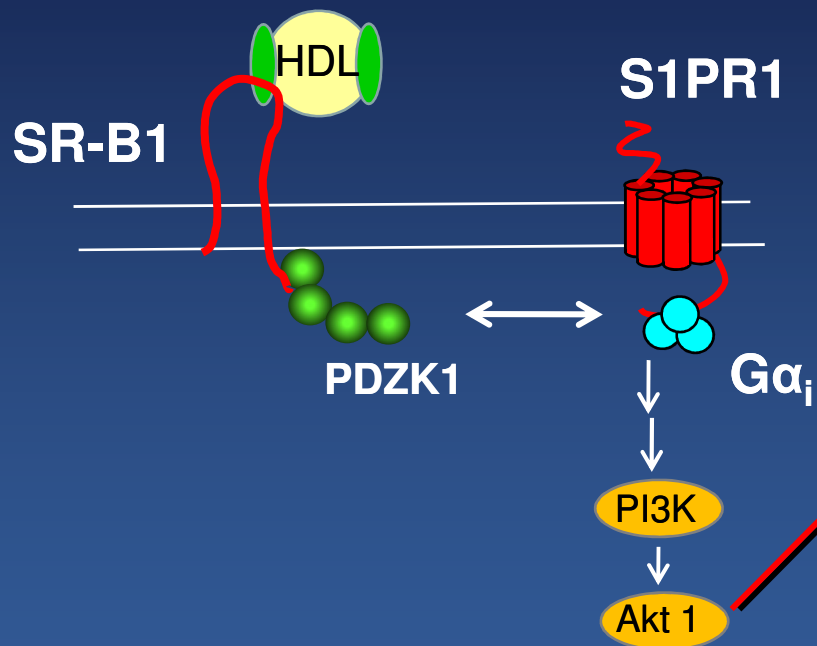


Apoptosis

Nuclei

Yi Zhang, Aishah Al-Jarallah

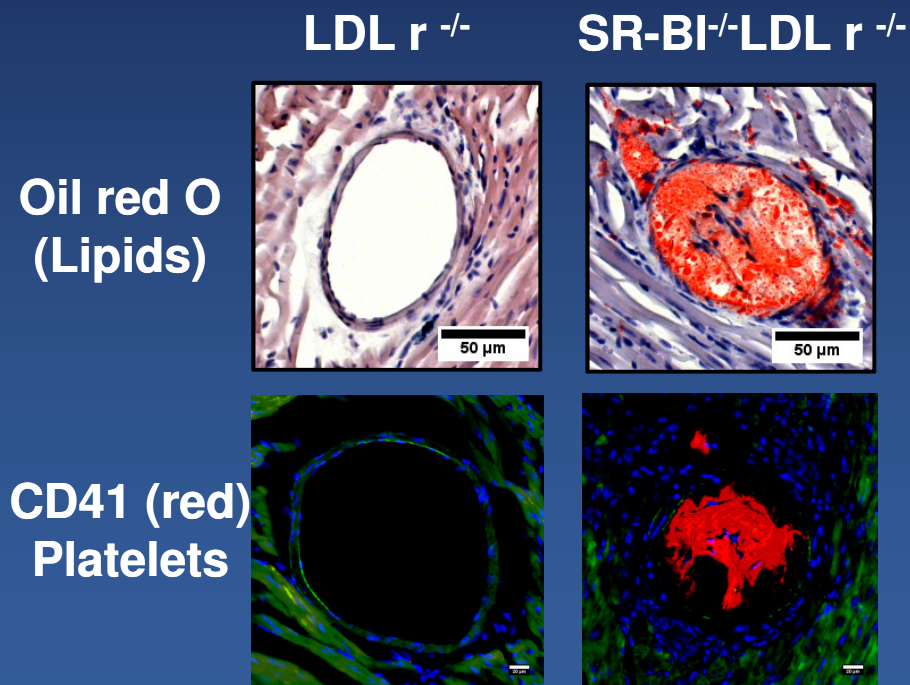
Summary



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Inactivation of SR-B1 in *All Tissues* of LDL Receptor $-/-$ Mice Results in Diet-Induced Coronary Artery Atherothrombosis

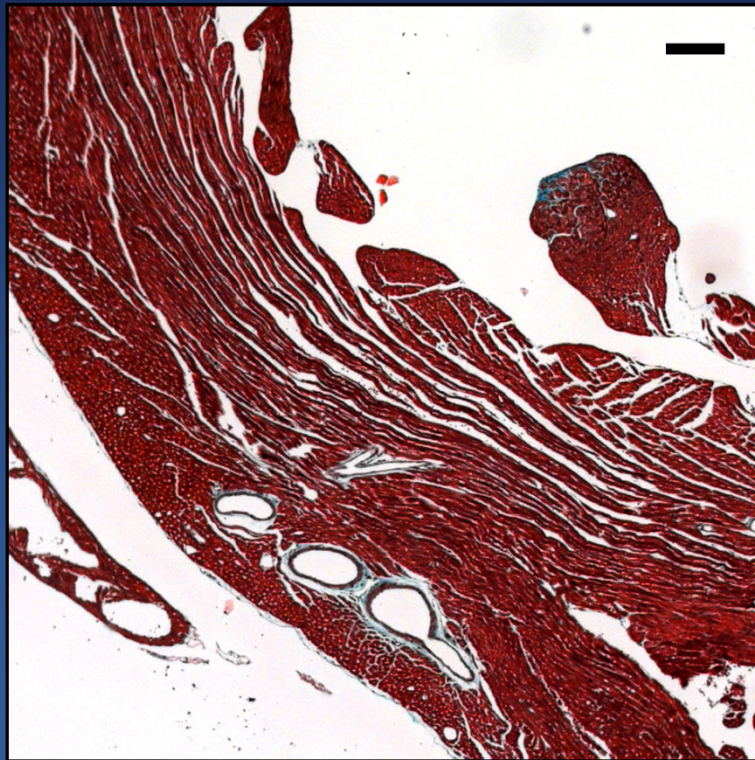


15 % Fat, 1.25 % Cholesterol, 0.5 % Cholate; 3.5 weeks

Mark Fuller

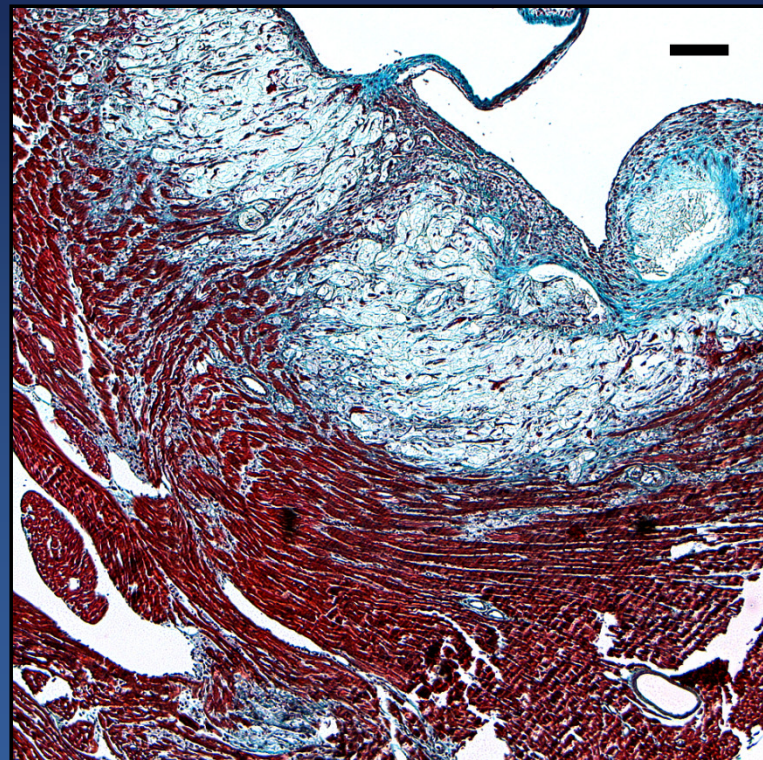
SR-BI^{-/-}LDL R^{-/-} Mice Fed High Fat, High Cholesterol Diet Develop Extensive Cardiac Fibrosis

LDL r^{-/-}



healthy

SR-BI^{-/-}LDL r^{-/-}

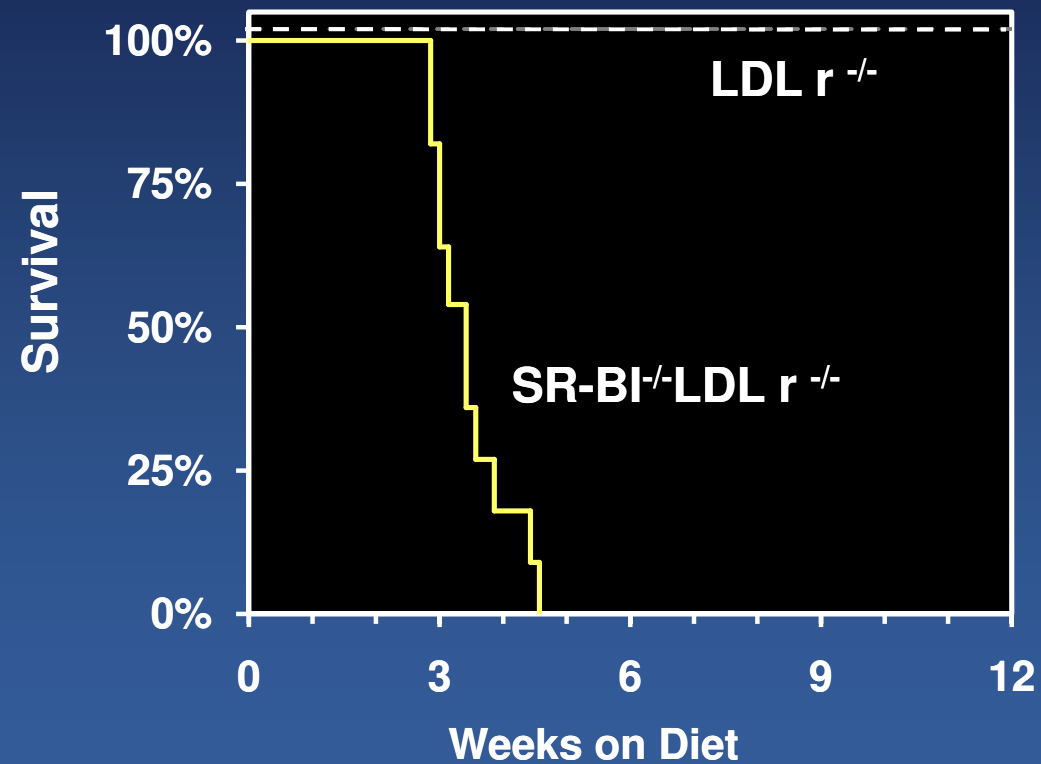


*Infarcted
fibrotic*

15 % Fat, 1.25 % Cholesterol, 0.5 % Cholate; 3.5 weeks; trichrome stain

Mark Fuller

Reduced Survival of SR-BI^{-/-}LDLr^{-/-} mice Fed an Atherogenic Diet



15 % Fat, 1.25 % Cholesterol, 0.5 % Cholate

Mark Fuller

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International

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