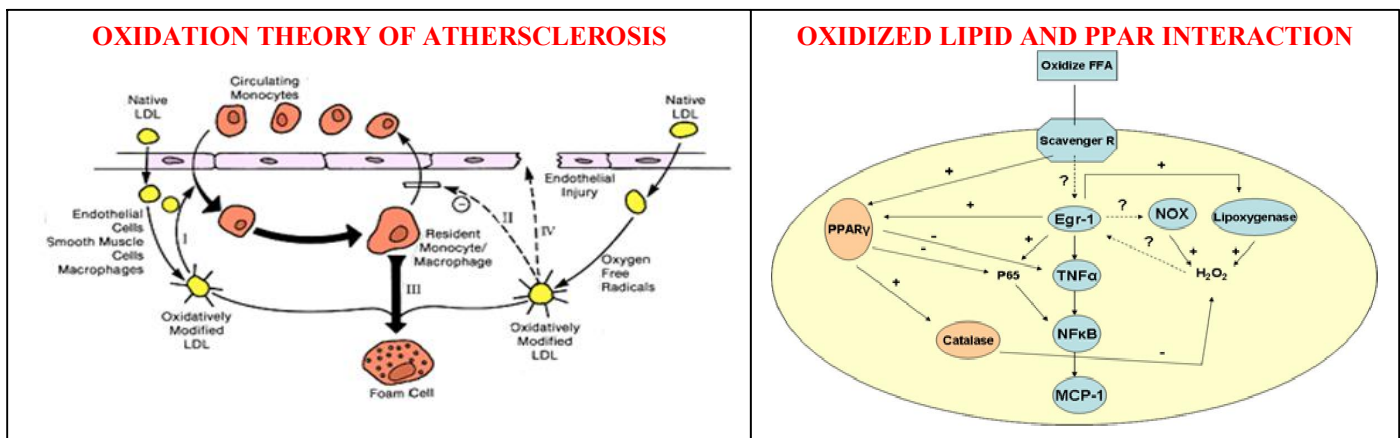


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PROJECTS IN PROGRESS

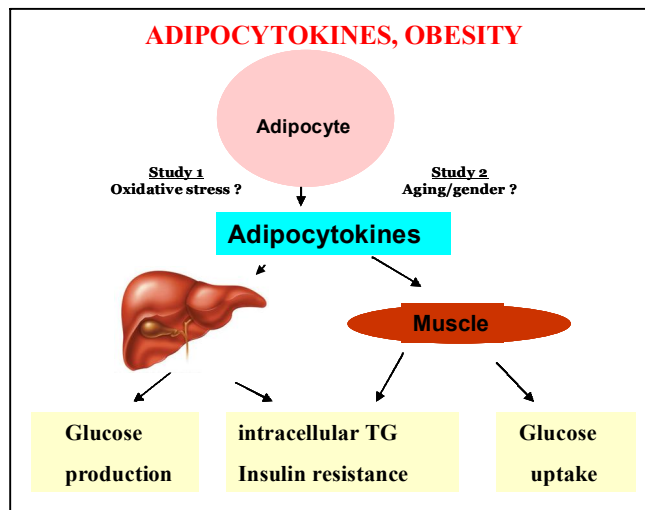
PROJECT I: CARDIOVASCULAR DISEASE

Oxidized Lipids and Vascular Cells: Oxidation of low density lipoprotein (LDL) plays a major role in cardiovascular disease (CVD), especially **Atherosclerosis (blockage of arteries)**. The pro-atherogenic effects of oxidized LDL are attributed to its associated lipids. However, studies have shown that oxidized lipids/lipoproteins can also have anti-atherogenic effects such as induction of antioxidant enzymes. This biphasic effect of oxidized lipids depends on its interactions with cellular proteins such as Peroxisome Proliferator-activated receptors or PPARs (nuclear receptors involved in lipid and glucose metabolism). Studies in our laboratory are investigating the interactions between oxidized lipids and PPARs using both vascular cells and animal models of atherosclerosis. Our studies will not only help in understanding the biphasic effect of oxidized lipids in atherosclerosis but might also identify future markers for therapy. [NIH Funded study]



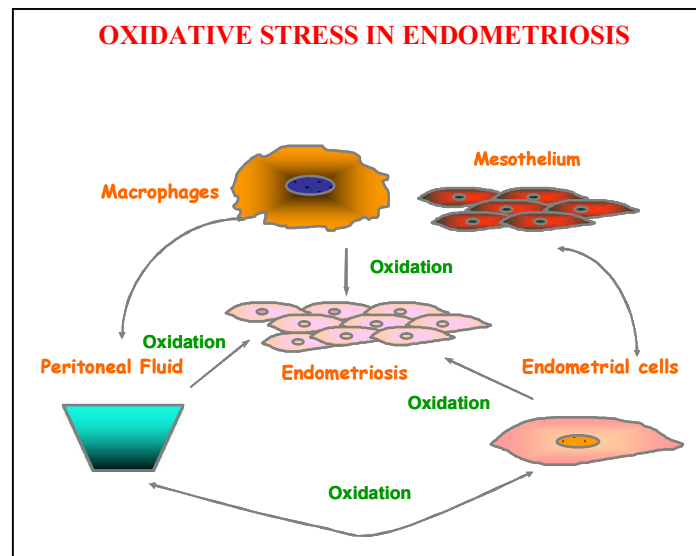
PROJECT II – OBESITY

Ectopic fat, aging and obesity: Obesity is a worldwide public health concern that predisposes individuals to increased risk to cardiovascular disease (CVD) and Type 2 diabetes. West Virginia has the second largest number of people with obesity in the United States. Increase in visceral/abdominal adiposity is a hallmark for obesity. However, increase in ectopic fat (deposition of fat in non-adipose tissue) is correlated with obesity and is also a marker for future cardiovascular events. Aging is an independent risk factor for CVD. Aging also increases fat redistribution and alters its function. Studies in our laboratory are investigating the effect of aging and obesity on the distribution and function of epicardial/perivascular fat (the fat that surrounds the heart and the coronaries) in animal models and human samples. [Grant in submission]



PROJECT III – REPRODUCTIVE ENDOCRINOLOGY

Oxidative stress, Pain and Endometriosis: Endometriosis is a disease that afflicts women of child-bearing age. The two major clinical characteristics of this disease are infertility and pain. Though several theories have been put forward, the etiology of endometriosis is still unknown. Earlier clinical studies conducted in our laboratory indicated that oxidative stress may play an important etiological role in endometriosis. In collaboration with the Department of Obstetrics and Gynecology, Marshall University Joan C. Edwards School of Medicine, we are currently investigating the mechanisms by which oxidative stress plays a role in the progress of this disease. We anticipate that results from this study will help identify potential therapeutics for this disease. [*Grant in preparation*]



CLINICAL STUDIES:

1. Effect of age and gender on epicardial fat function in patients undergoing Coronary Bypass graft surgery (CABG): In collaboration with Department of Medicine and Department of Cardiothoracic Surgery, St. Mary's Heart Center, Huntington, WV.
2. Oxidative stress and Endometriosis: In collaboration with Department of Gynecology and Obstetrics, Cabell Huntington Hospital, Huntington, WV.

CURRENT FUNDING

1. RO1 HL74239, NIH/NHLBI: Oxidized Lipids in Cardiovascular disease, 6/01/2004 – 5/31/2009

RECENT PUBLICATIONS

1. Ramachandran, S. Penumetcha, M. Khan, N-M., **Santanam, N.**, Rong, R., and Parthasarathy. S. Exercise reduces preexisting atherosclerotic lesions in LDL receptor knock out mice. (2005) *Arteriosclerosis*. 178:33-38.
2. Chen Wei, Meera Penumetcha, **Nalini Santanam**, Ya-Guang Liu, Mahdi Garelnabi, and Sampath Parthasarathy. Exercise might favor reverse cholesterol transport and lipoprotein clearance: potential mechanism for its anti-atherosclerotic effects. (2005) *Biochem. Biophys. Acta* 1723:124-7
3. Karabina, SA, Lehner, A., Frank, E., S. Parthasarathy and **Santanam, N.** Oxidative inactivation of Paraoxonase- Possible implications in Diabetes and atherosclerosis. (2005), *Biochem. Biophys. Acta*. 1725:213-221.
4. Park. JK, Song. MQ, Dominguez. CE, Walter MF, **Santanam N**, Murphy. AA. Glycodelin mediates the increase in vascular endothelial growth factor in response to oxidative stress in the endometrium. (2006), *Am. J. Obstet & Gynecol*. 195(6):1772-7.
5. S. Bhaskaran, **N. Santanam**, M. Penumetcha and S. Parthasarathy. Inhibition of atherosclerosis in LDL receptor knock out mice by sesame oil. (2006) *J. Medicinal Food* 9(4):487-490.
6. **N. Santanam** and S. Parthasarathy. Aspirin is a substrate with paraoxonase-like activity: Implications in Atherosclerosis (2007), *Atherosclerosis*, 191(2):272-5.
7. M. Garelnabi, K. Selvarajan, D. Litvinov, **N. Santanam** and S. Parthasarathy. Dietary oxidized linoleic acid lowers triglycerides via APOA5/APOCIII dependent mechanisms. (2008) *Atherosclerosis*, 199(2):304-9.
8. Yu, B, C. Cook, **N. Santanam**. The aporphine alkaloid boldine induces adiponectin expression and regulation in 3T3L1 cells. (2009), *J. Medicinal Food* (in press).
9. L.A. Dvoracek, J.I. Kreisberg, J. McKinney, G. Schmid, A.D. Francis, K.L. Kackmarick, H.M. Lee, M.S. Detrick, D.A. Primerano, **N. Santanam** and R. Kreisberg. Lovastatin inhibits oxidized L-A-phosphatidylcholine B-arachidonylgammalmitoyl (oxPAPC) stimulated interleukin-8 mRNA and protein synthesis in human aortic endothelial cells by depleting stores of geranylgeranyl pyrophosphate. 2009. *Circulation*. (in submission).
10. J. Fei, E. Blough and **N. Santanam**. Aging alters Epicardial Fat Adipokines in Fischer 344 x Brown Norway Hybrid Rats. 2009 *Int. J Obesity* (in preparation).
11. J. Fei, C. Cook and **N. Santanam**. Linoleic acid and its oxidized form regulates proteasome mediated turnover of Peroxisome Proliferators activated Receptor α and γ in rat aortic smooth muscle cells. (in preparation).

PEOPLE IN THE LABORATORY

1. Nalini Santanam, PhD, MPH – Associate Professor
2. Jia Fei, MD, PhD – Post Doctoral Fellow
3. Carla Cook, BA – Research Associate
4. Matt Christiansen , BS – MS graduate student

