

Contribution ID: 123

Type: **Oral Presentation**

## Arterial remodelling in atherosclerosis

*Thursday, 12 July 2018 10:30 (30 minutes)*

The arterial wall is composed of three distinct layers: the innermost intima, the media, and the adventitia. Atherosclerosis is an inflammatory disease of the artery characterized mainly by an expansion of the intima. In 1987, Seymour Glagov quantified arterial remodelling as atherosclerosis progressed. He found that the remodelling occurred in two stages: first a compensatory phase in which the lumen maintained its size, followed by a negative remodelling phase in which the lumen cross-sectional area decreased. To date, the exact mechanisms responsible for this behaviour have not been elucidated.

In this talk I will discuss a three-layer mechanical model based on a theory of morphoelastic growth and hyperelasticity. I will present a 1D axisymmetric model that can explain Glagov Remodelling in humans and intimal thickening in animals, and a generalization to 2D which is solved using finite elements.

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**Session Classification:** Models for chronic immune lesions: Lessons from atherosclerosis and tuberculosis

**Track Classification:** Minisymposium: Models for chronic immune lesions: Lessons from atherosclerosis and tuberculosis