

1077-VG-2241 **Rebecca M Vandiver*** (vandiver@stolaf.edu). *The Mechanical Stability of Growing Arteries.*

In many cylindrical structures in biology, residual stress fields are created through differential growth. In particular, if the outer and inner layers of a cylinder grow at different rates, parts of the cylinder will be in a state of axial compression and other parts will be in tension. These tissue tensions play a fundamental role in the overall rigidity and stability of the cylinder. In this talk I will discuss the possible role of axial residual stress in regulating stress in arteries and preventing buckling instabilities. It is shown that axial residual stress lowers the critical internal pressure leading to buckling and that a reduction of axial loading may lead to a buckling instability which may eventually lead to arterial tortuosity. (Received September 21, 2011)