

## **Abstract**

Knowledge of the characteristics of vascular smooth muscle cells is important in understanding physicommechanical properties, functions, mechanisms of development, remodelling, regeneration of blood vessels, development and progression of their diseases like atherosclerosis. As the latter diseases become more common, there is need to understand their pathogenesis to inform mitigation strategies. Goat is a suitable model for vascular studies but the organization of vascular smooth muscle cells in its aorta have not been elucidated. This study therefore examined the characteristics of smooth muscle cells in the aorta of goat. Materials were obtained from aortae of six healthy young adult male domestic goats (*Capra hircus*) [age range 12 – 36 months]. Specimens from thoracic aorta were fixed in glutaraldehyde, post fixed in osmium tetroxide and processed for ducurpan embedding. Ultrathin sections stained with uranyl acetate, counterstained with lead citrate were examined by transmission electron microscope. The aortic tunica media contained several phenotypic dispositions of smooth muscle cells; spindle shaped or elongated organelle - poor cells; irregularly shaped cells rich in rough endoplasmic reticulum, mitochondria and a prominent nucleus. The smooth muscle cells also ran in various directions: transverse, oblique and longitudinal. These findings reveal that the smooth muscle cells of the tunica media of goat aorta are phenotypically heterogeneous and run in multiple directions. These characteristics probably confer mechanical strength and functional plasticity to the aortic wall. Designers of aortic substitutes should bear this in mind.

**Key words:** Vascular, Smooth Muscle Cells, Heterogeneity, Aorta