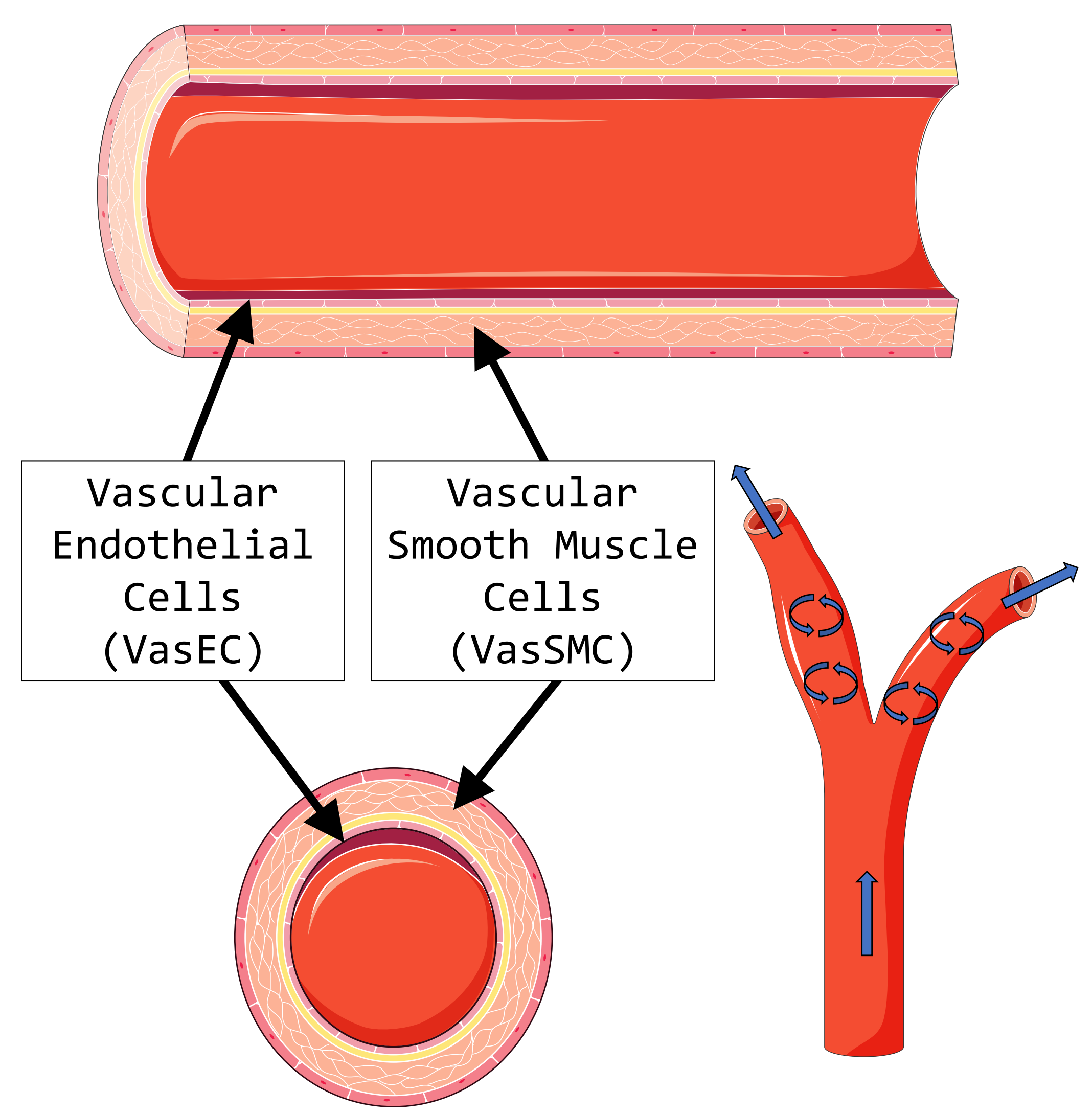


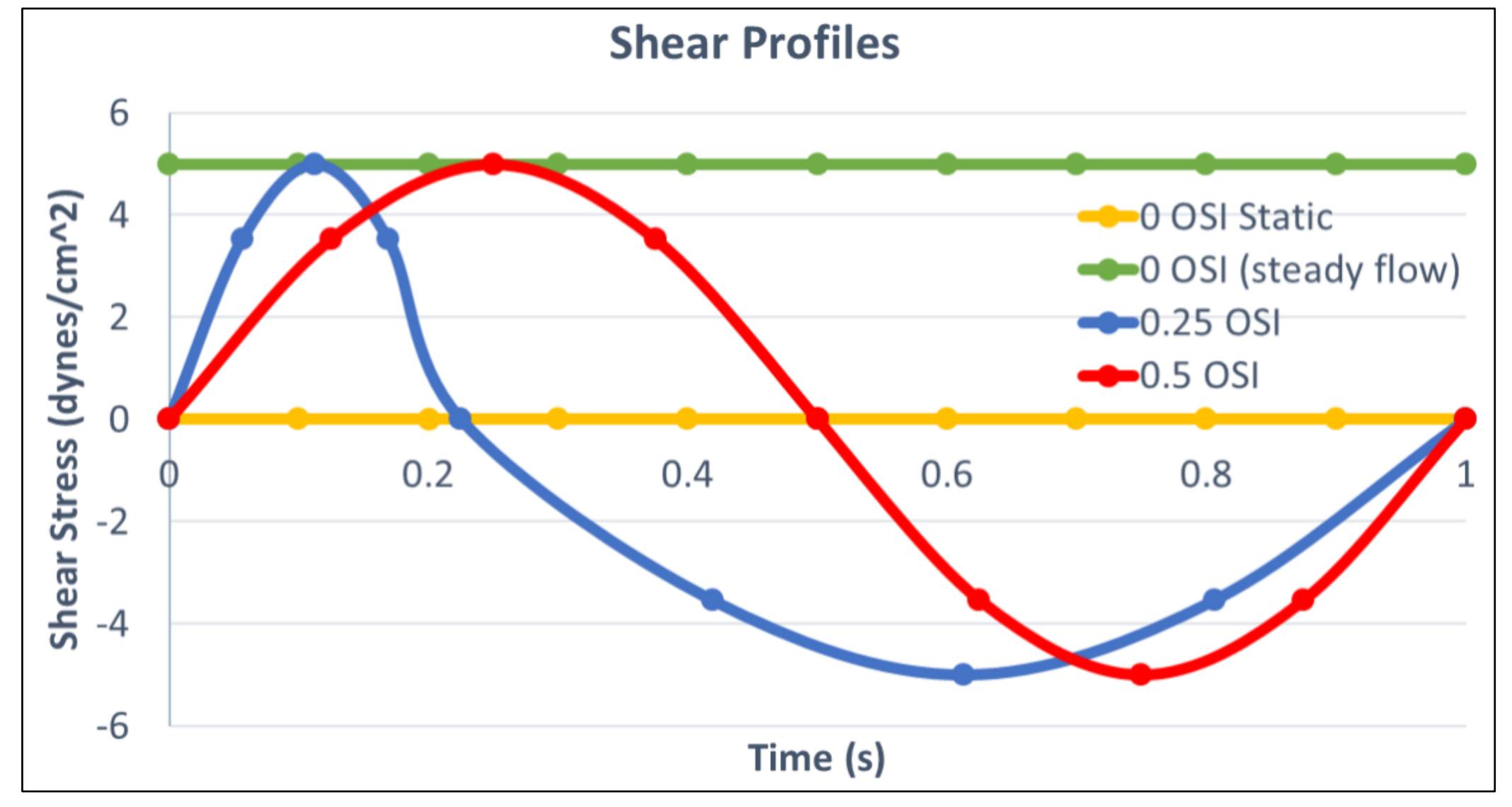
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INTRODUCTION



- Pulsatile flow subjects blood vessels to oscillatory shear, especially at bifurcation sites.
- The study investigates VasEC responses to stress environments and paracrine regulation of VasSMCs.
- Expression of αSMA in VasSMCs is associated with contractile phenotypes that are central to vessel tissue architecture.

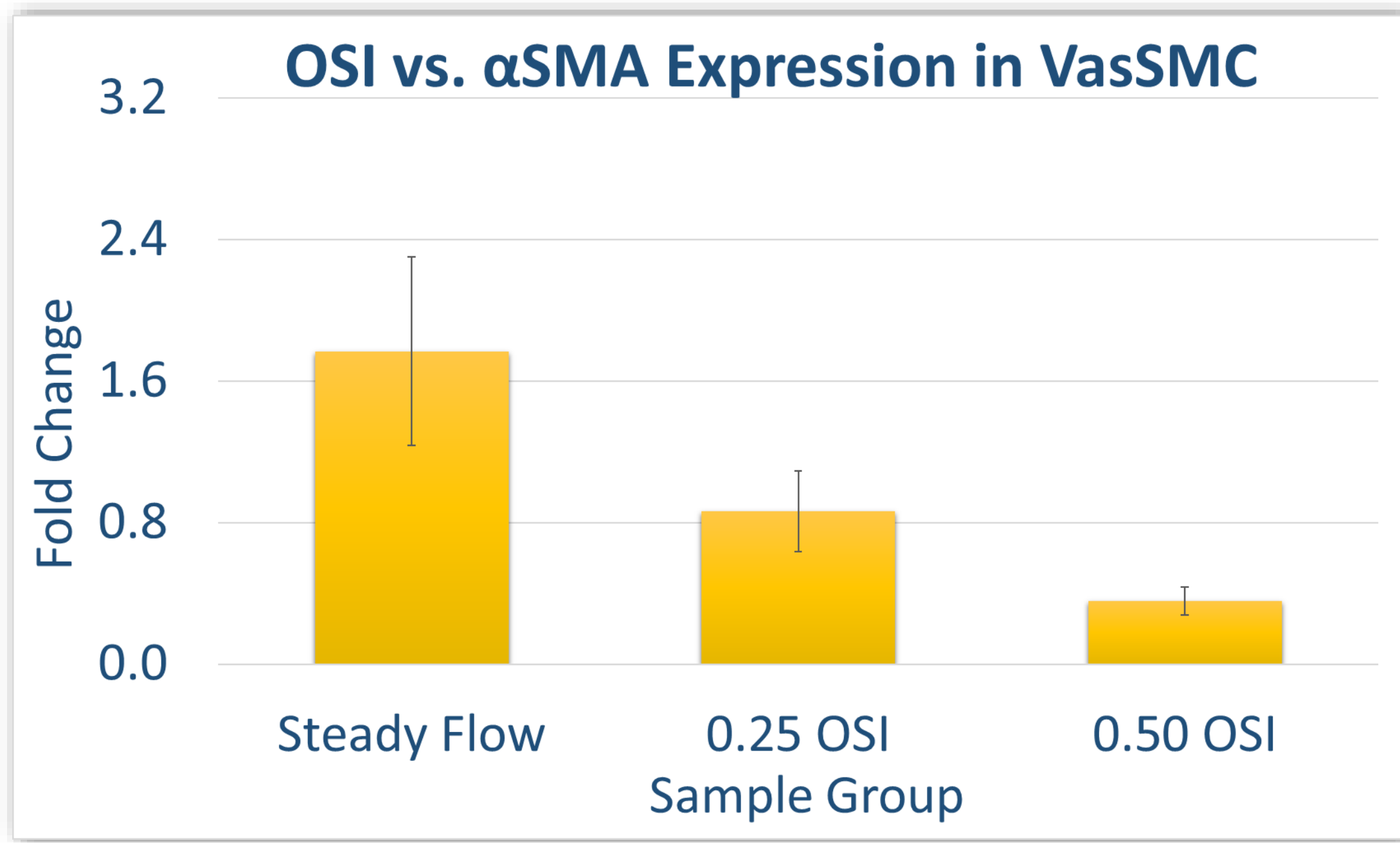


- Oscillatory shear index (OSI): A parameter that quantifies the change in direction and magnitude of wall shear stresses
- $0 \leq OSI \leq 0.5$
- $OSI = \frac{1}{2} \left(1 - \frac{\int_0^T \tau_\omega dt}{\int_0^T |\tau_\omega| dt} \right)$
- where τ_ω = wall shear stress, T = cycle duration, t = time
- Four OSI magnitudes are to be applied to endothelial cells:
 - No flow (static)
 - Steady flow (OSI = 0)
 - 0.25 OSI
 - 0.50 OSI
- Data analysis consists of real time polymerase chain reaction (RT-PCR) αSMA gene expression followed by Livak method, or $\Delta\Delta C_T$.

METHODS

ITEM	DESCRIPTION	
Porcine Vascular Cells	Vascular Endothelial Cells (VasEC) 	Vascular Smooth Muscle Cells (VasSMC)
Conditioning Media	100% Fresh media	50% VasEC Spent media 50% Fresh media
Seeding Method Conditioning time: 48 hrs	Bioflux 24-well Plate 	T75 Culture Flasks
Samples Collected	VasEC spent media VasEC RNA Extraction 	VasSMC RNA Extraction
Data Collection	RT-PCR 	

RESULTS & CONCLUSION



- Highest expression of αSMA was observed in VasSMCs (n=6) exposed to steady flow conditioned media from endothelial cells.
- Downregulation of αSMA by VasSMCs suggests loss of contractile phenotype via high oscillatory flow-activating VasEC-VasSMC paracrine signaling events.
- Statistical analysis showed a significantly higher expression (p=0.04) of αSMA in the steady flow group (OSI=0) compared to OSI=0.50.
- Expression of αSMA between flow groups OSI=0 vs. OSI=0.25 and OSI=0.25 vs OSI=0.50 were not significant (p=0.30).
- VasECs exposed to moderate levels of flow oscillation will maintain VasSMC contractility via paracrine signaling in a similar manner to VasECs exposed to steady flow.
- Downregulation of αSMA by VasSMCs suggests loss of contractile and non-proliferative phenotype.

COMMENTS

READ ABSTRACT HERE!

