

# Extracellular osmolality and vascular smooth muscle activity.

## -- Paradoxical inhibition of vasoconstrictor and vasodilator responses by hypertonic mannitol in isolated arterial smooth muscle

Description: -

**Nerves and hormones**

- Smooth muscle tension 張力 can be either increased or decreased by neural activity → 例如副交感神經興奮會擴張平滑肌收縮，而交感神經則讓平滑肌收縮
- A given neurotransmitter may produce opposite effects in different smooth muscle tissues → 例如去甲腎上腺素在大多數的血管平滑肌作用在α受器會造成收縮，但作用在支氣管平滑肌的β受器則造成鬆弛
- Second messengers ( $IP_3$ ) can cause release of  $Ca^{2+}$  from the SR 產物會釋放儲存在終池的鈣離子，但在沒有動作電位下，次級訊息傳導物也會引起收縮

**Local factors**

- Local factors 腹部因子, including paracrine agents 旁分泌, acidity, oxygen concentration, osmolarity 渗透性, and the ion composition 离子組成 of the extracellular fluid, can also alter smooth muscle tension
- Nitric oxide (NO) 一氧化氮 is one the most commonly encountered paracrine agents that produces smooth muscle relaxation 放鬆



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Tags: #Cell #volume #as #a #factor #influencing #electrical #and #mechanical #activity #of #vascular #smooth #muscle.

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Furthermore, the micrographs show that A7r5 cells display a VSMC-typical morphology.

## Regulation of Extracellular Fluid Composition & Volume

All values were obtained at week 18. We propose that the protective effect of VSM- Egfr-KO on vascular remodelling leads to partial prevention of renal damage, due to normalisation of glomerular haemodynamics and function.

## Microvascular effects of hypertonic solutions in the hamster

Preservation of endothelial function or glomerular filtration barrier during HFD are examples shown in our study.

## Cell volume as a factor influencing electrical and mechanical activity of vascular smooth muscle.

Ingenuity Pathway Analysis IPA software Qiagen, Hilden, Germany was used for functional analysis canonical pathways, upstream regulator and downstream effects analyses; these features are not included in gProfiler or GOrilla on the lists of regulated genes results of the differential expression analyses. Finally, maximum mitochondrial OCR of VSMCs in primary culture from KO animals was lower than in WT cells ESM Fig.

## Cell volume as a factor influencing electrical and mechanical activity of vascular smooth muscle.

The detailed pattern of differentiation regulation under our experimental conditions will need to be assessed in future studies. Mulvany MJ, Halpern W 1977 Contractile properties of small arterial resistance vessels in spontaneously hypertensive and normotensive rats. Multiple testing was performed using the Benjamini—Hochberg B—H procedure.

### **Cell volume as a factor influencing electrical and mechanical activity of vascular smooth muscle.**

Glucose elicited a mainly graded response ESM Fig. Benter IF, Yousif MHM, Griffiths SM, Benboubetra M, Akhtar S 2005 Epidermal growth factor receptor tyrosine kinase-mediated signalling contributes to diabetes-induced vascular dysfunction in the mesenteric bed.

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