

Autoregulation

the ability of an organ to maintain blood flow across a range of perfusion pressures

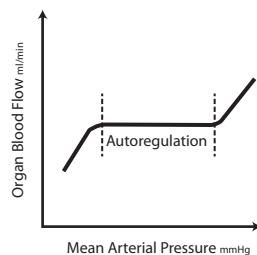
flow = pressure/resistance therefore flow is maintained by changing the resistance

two mechanisms for autoregulation

pressure autoregulation via myogenic stretch response

metabolic or vasoactive autoregulation from locally derived vasoactives or metabolites

demonstrated graphically below



Renal blood flow

receives 1100ml/min

20-25% of CO

afferent and efferent arterioles are the main resistors and control blood flow

extensive sympathetic innervation acts on both the afferent and efferent to extrinsically control flow

Autoregulation of renal blood flow

Maintains blood flow within a range of pressures from 75-170 mmHg

Two mechanisms

Myogenic stretch response

increased stretching causes membrane depolarisation

increased intracellular calcium concentrations

vasoconstriction

Tubuloglomerular feedback

macula densa is the sensor, it detects sodium concentration in the tubules

the vasoactives released are possibly NO and adenosine

the afferent arteriole is the effector

constricts (increases resistance) if sodium is elevated

dilates (decreases resistance) if sodium is low

therefore demonstrates negative feedback