**Sample questions with Answers**

1. Sweat in patients acclimatised to hot weather (as compared to patients in a temperate climate) contains less Na+ because:

A. Takes longer for Na+ to be transported through sweat ducts

B. Aldosterone effect causing a reduction in Na+ in sweat – this does have an effect but (Brandis, p22) suggests that this is ‘another effect’

C. Increased intake of water causing a reduction in Na concentration

D. ?

2- Magnesium is required for:

A. To Depolarise excitable cell membranes – reduces membrane excitability (Brandis, p17)

B. Na+-K+ ATPase – Yes, an important cofactor for all enzymes that involve phosphate transfer among

others

C. Coagulation - No

D. ?

E. ?

3- Organic ion necessary in Na-K ATPase

A. ?

B. ?

C. Mg+2 - Correct

D. PO4

E. SO4-2

4- Renal blood flow is dependent on:

A. Juxtaglomerular apparatus – Altered by but not DEPENDANT on

B. [Na+] at macula densa – Altered by but not DEPENDANT on

C. Afferent vasodilatation – Altered by but not DEPENDANT on

D. Arterial pressure – Yes… if there is NO PRESSURE…

E. Efferent vasoconstriction – Altered by but not DEPENDANT on

5- Factors (not) affecting ?renal blood flow/GFR:

A. Sympathetic nervous system – Yes, NA causes contraction of mesangial cells and decreases area available for filtration in the glomerulus

B. Sodium flow past macula densa – Yes, Renin secretion inversely proportional to transport of Na and Cl across this portion (macula densa) just before the start of the DCT

C. Afferent arteriolar vasodilatation – Yes, increases GFR

D. Arterial pressure – No, only at extremes of pressure (outside autoregulatory range) – between 80-180mmHg

E. Efferent arteriolar vasoconstriction – Yes, increases GFR (probably the least important if the question was regarding RBF)

6- Renal blood flow:

A. Is 600-650ml/min per kidney – Correct (which equals about 1250ml/min for BOTH kidneys – ie. 25% of cardiac output)

B. Is directly measured by infusing PAH – No, indirectly measured (0.9x RPF -> PAH clearance – then need

to take into consideration Hct to get RBF)

C. Is increased by sympathetic tone – Strange answer…

**7-**  Renal blood flow:

A. Greater per unit mass than cerebral blood flow – Correct (Brain 54ml/min/100g)

B. Is greater in the medulla compared to the cortex – No, less (Cortex 450ml/min/100g, Outer Medulla 20ml, Inner Medulla 3ml)

C. Is closely related to tubular sodium reabsorption – Not closely

D. Only sympathetically mediated – No, autoregulated, Angintensin II,prostaglandins, etc etc

E. Some noradrenergic endings on JG complex and tubules - Yes, by Renin exretion & Na resorption respectively – but does this have immediate impact on renal blood flow?

F. Parasympathetic via hypogastric plexus – No, vagal origin via aorticorenal plexus

**8-**  Which has the greatest renal clearance?

A. PAH - Yes, used to measure renal plasma flow (ie. Assumes that the renal vein has no PAH)

B. Glucose – No, 100% reabsorbed

C. Urea – No, 53% reabsorbed

D. Water - No

E. Inulin – No, only a measure of GFR (since amount excreted per unit time = GFR + Tx (net amt transferred))

**9-** The ascending limb of the Loop of Henle is: (thick)

A. Impermeable to Na+ - No, active transport… (Na-K-2Cl-ATPase)

B. Involved in active transport of K+ into the lumen – No, passive diffusion and actively pumped out

C. Involved in active transport of Cl- out of lumen – Yes (Na-K-2Cl-channel) – secondary active transport…

D. Involved in active transport of Na+ into lumen – No, out of lumen (Na-K-2Cl cotransporter) - which is

SECONDARY active transport

E. Hypotonic at the top – No, the tubuler fluid is hypotonic BEYOND the top of the LOH as Na and Cl

pumped out…

F. ?None of the above ?Actively transports water – No, passive

**10-**  The hypothalamus inhibits the release of:

A. TSH

B. ACTH

C. FSH

D. GH – Correct (somatostatin)

E. Oxytocin

**11-**  Secretion of renin is stimulated by:

A. Increased left atrial pressure – No this secretes naturetic peptide

B. Increased angiotensin II – No, this stimulates angiotensinogen production, but has a negative effect on renin production

C. Decreased right atrial pressure – Probably, a low pressure baroceptor response?

12- Which decreases renin release:

A. PG – No, this stimulates renin secretion

B. Angiotensin II – Correct, negative feedback by A2 on renin release

C. Vasopressin – Correct, this inhibits renin secretion

D. Baroceptor stimulation – No, this would increase renin secretion

13- In skeletal muscle:

A. Relaxation is due to passive Ca++ uptake by sarcoplasmic reticulum – No, it is an ACTIVE process

B. Contraction is due to Ca++ release from T tubules – No, T tubules are only responsible for allowing rapid propagation of the AP deep within the myofibril

C. Contraction is due to Ca++ binding to tropomyosin – No, it binds to troponin C which releases tropomyosin

from the myosin head binding sites…

D. Z lines move together in contraction – Yes

**14-**  In smooth muscle:

A. Spontaneous pacemaker potentials are generated – Yes

B. An action potential is required for contraction – No, not REQUIRED

C. Ca++ is released from sarcoplasmic reticulum – Yes, but not the main source (mostly extracellular)

D. Multiple spiking action potentials occur with increased membrane potential – Yes

**15-**  Contraction in smooth muscle is different from skeletal muscle:

A. Source of Ca++ is different – Yes, most Ca++ comes from the ECF

B. Force is greater in smooth muscle than in skeletal muscle

C. Unable to produce same force of contraction – No, can be just as powerful if not more… think of labour!

D. Unable to maintain same duration of contraction – No, can have quite prolonged duration, despite no stimulus even…

E. Has prolonged latency – Yes