

Glossary

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Gadolinium

Gadolinium is a rare-earth metal that can be used as a research tool for applications such as magnetic resonance imaging (MRI). It can be used as MRI contrast agent, since as a paramagnetic ion it moves differently within a magnetic field. Gadolinium can also be used in ion channel electrophysiology experiments to block sodium channel leaks, as well as to stretch activated ion channels.

Renin

Renin is an enzyme that participates in the body's renin-angiotensin system (RAS) and mediates blood volume and arterial vasoconstriction. It is therefore an important regulator of blood pressure. Renin is secreted by the kidney granular cells of the juxtaglomerular apparatus and hydrolyzes angiotensinogen secreted from the liver into the peptide angiotensin I. Angiotensin I is then converted by endothelial-bound angiotensin converting enzyme (ACE) into angiotensin II, a potent constrictor of blood vessels.

Norepinephrine

Norepinephrine (sometimes called noradrenaline) is a catecholamine with multiple roles, including as a hormone and a neurotransmitter. Along with epinephrine (adrenaline), norepinephrine is also part of the fight-or-flight response, and directly increases heart rate, triggers the release of glucose from energy stores, and increases blood flow to skeletal muscle. Norepinephrine also increases blood pressure by increasing

vascular tone through α -adrenergic receptor activation. The actions of norepinephrine are carried out via binding to adrenergic receptors.

Sodium excretion

Sodium is filtered by the kidney and can be excreted in the urine. Sodium excretion is measured in terms of plasma and urine sodium, rather than by the interpretation of urinary sodium concentration alone, as urinary sodium concentrations can vary with water resorption. Therefore the urinary excretion rate can be used to get a measure of renal clearance. Sodium excretion is used in acute renal failure in order to determine if hypovolemia or decreased effective circulating plasma volume is a contributor to renal failure.

Troponins

Troponins are important proteins involved in muscle contraction. They are located within grooves between actin filaments in muscle tissue. Troponins consist of three subunits: troponin C (TnC), troponin I (TnI), and troponin T (TnT). Binding of calcium to TnC results in a shift in tropomyosin such that actin filaments can interact with myosin to produce force and/or movement. In the absence of calcium, tropomyosin interferes with this action of myosin, and therefore muscles remain relaxed. TnT binds to tropomyosin, interlocking them to form troponin-tropomyosin complex. TnI binds to actin in thin myofilaments to hold the troponin-tropomyosin complex in place.