ALPHA-1 ADRENERGIC RECEPTOR

By Nicole Kluenker and Victor Calderon
PROPERTIES

- A member of the Gq protein-coupled receptor family
- Triggered by norepinephrine, epinephrine and isoprenaline in decreasing potency
- Effects level of Calcium in cells when activated
- Mechanism: PLC activated
Heterotrimeric G protein activates phospholipase C (PLC) → IP3 and Calcium

IP3 moves into cytosol, activates receptor on ER → Calcium is released from stores
WHAT DOES IT DO?

- Present in high numbers in vascular smooth muscle
  - Activation results in vasoconstriction which increases venous resistance and raises blood pressure
  - Typically activated upon postural change to keep blood in your brain
- Smooth muscular contraction
  - GI sphincters
  - Urinary bladder
  - Pupil dilation
  - Kidney
  - Brain
NOTABLE PHARMACEUTICALS

Agonists
- Midodrine (Antihypotensive)
- Phenylpephrine (decongestant)
- Pseudophedrine (decongestant)

Antagonists
- Labetolol (Antihypertensive)
- Risperidone (mood disorder treatment)
- Trazodone (sleep aid)
EXERCISE

- Muscles being worked will ‘back burner’ the Alpha-1 adrenergic receptor and allow vasodilation to take place
- Muscles not performing work will be dominated by Alpha-1 adrenergic receptors
  - Net result is vasoconstriction, this allows you to stay conscious during exertion