AI-03538 Rectal Stretch Receptors

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Name of the stretch sensor for defecation trigger

The stretch sensor that triggers the urge to defecate is primarily the rectal stretch receptors, which are a type of mechanoreceptor located in the walls of the rectum.

Main Sensor

- Rectal Stretch Receptors (Rectal Mechanoreceptors)
  These receptors detect distension of the rectal wall when stool enters the rectum from the sigmoid colon.

Physiological Reflex Involved

The signal from these stretch receptors initiates the Defecation Reflex, which includes the Rectoanal Inhibitory Reflex.

Step-by-Step Neurophysiology

1. Rectal filling
   - Feces moves from the sigmoid colon into the rectum.
   - The rectal wall stretches.
2. Activation of stretch receptors
   - Rectal mechanoreceptors detect the distension.
3. Afferent nerve signaling

- Signals travel via pelvic splanchnic nerves (S2–S4) to the spinal cord.

4. Reflex activation
    - The Defecation Reflex begins.
5. Internal sphincter relaxation
    - Through the Rectoanal Inhibitory Reflex, the internal anal sphincter relaxes.
6. Conscious awareness
    - The brain perceives the urge to defecate.
7. Voluntary control
    - The external anal sphincter (skeletal muscle) decides whether to allow or delay defecation.

Key Structures Involved

Structure	Function
Rectal stretch receptors	Detect rectal distension
Pelvic splanchnic nerves (S2–S4)	Carry sensory signals
Enteric nervous system	Coordinates reflex
Internal anal sphincter	Involuntary relaxation
External anal sphincter	Voluntary control

✅ Simple summary:

The rectal stretch receptors (mechanoreceptors) detect stool stretching the rectum. This activates the defecation reflex, which relaxes the internal sphincter and creates the urge to poop.

If you’re interested, I can also explain why sometimes the urge disappears after a few minutes (the neurophysiology of rectal accommodation and reflex suppression). It’s a fascinating mechanism.