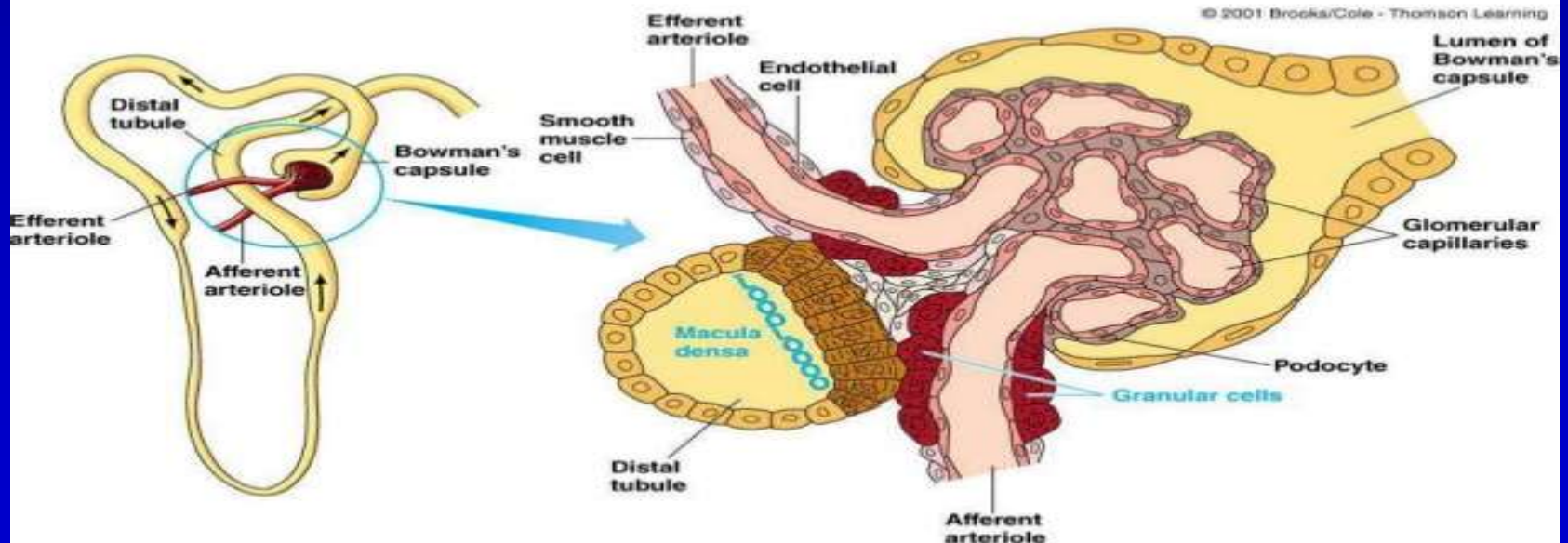


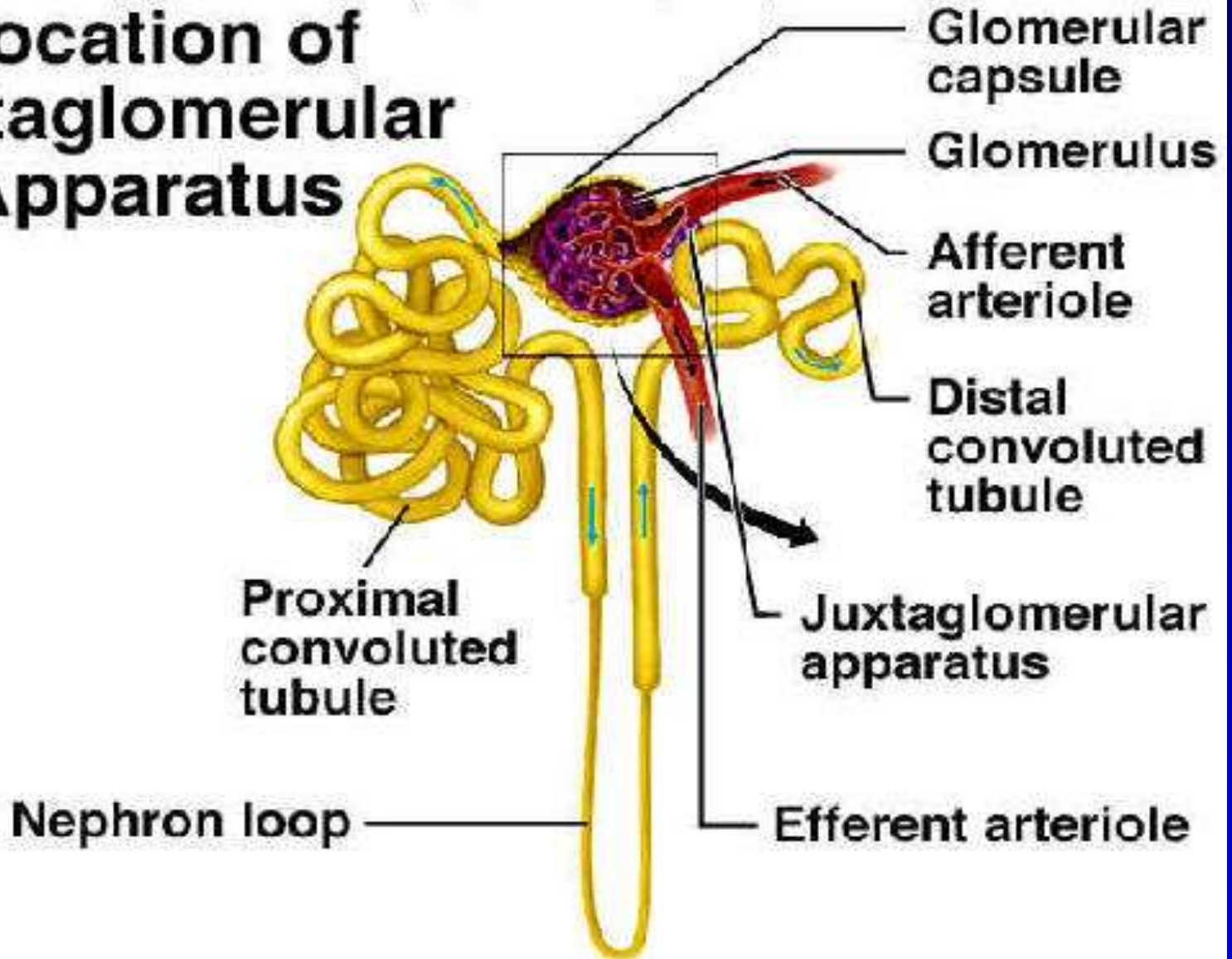
JUXTAGLOMULAR APPARATUS

2. The juxtaglomerular apparatus

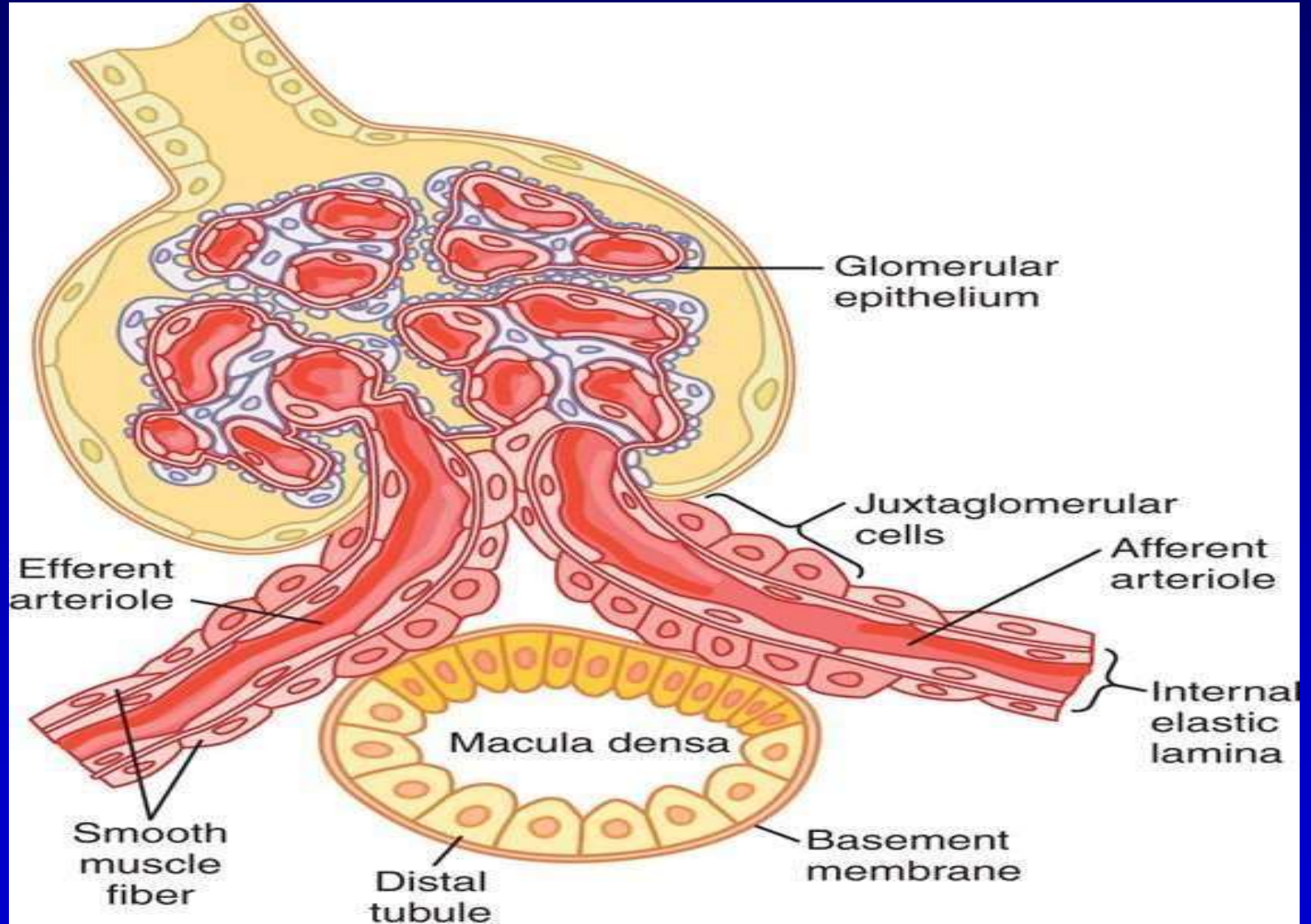
Including macula densa, extraglomerular mesangial cells, and juxtaglomerular (granular cells) cells



Location of Juxtaglomerular Apparatus



Juxtaglomerular Apparatus



Introduction

- It refers to collection of specialised cells located very near to the glomerulus
- Major component of Renin-Angiotensin-Aldosterone system secretes *RENIN*

- **Consists of three types of cells:**
 - ☐ **Juxtaglomerular cells**
 - ☐ **Macula densa cells**
 - ☐ **Mesangial cells**

1. Juxtaglomerular cells

- Specialized myoepithelial cells located in the media of the afferent arteriole in the region of the juxtaglomerular apparatus
- Characteristic features:
 - ❖ They have well developed Golgi apparatus & ER, abundant mitochondria & ribosomes
 - ❖ They synthesize, store & secrete an enzyme- **RENIN**

- **Renin is stored in secretory granules of JG cells & therefore these are also called- GRANULAR CELLS**
- **Acts as BARORECEPTORS, responds to change in transmural pressure gradient**
- **They are densely innervated by *sympathetic nerve***
- **The granulation of these cells increases when there is sustained Hypotension in afferent arteriole, in sodium deficiency**

2. MACULA DENSА CELLS

- Refers to the specialized renal tubular epithelial cells of a short segment of the thick ascending limb of loop of Henle
- Passes between afferent arteriole & efferent arteriole
- Characteristic feature:
 - ❖ They are not well adapted for reabsorption
 - ❖ They are not innervated
 - ❖ Have prominent nuclei, Golgi apparatus is located near the Basal membrane

- **These cells are in direct contact with mesangial cells & in close contact with juxtaglomerular cells**
- **They act as chemoreceptors & are stimulated by decreased NaCl concentration, causing release of RENIN**

3. MESANGIAL CELLS

- **Mesangial cells or Lacis cells are the interstitial cells of the juxtaglomerular apparatus**
- **Characteristic features:**
 - ❖ **They are in contact with both the macula densa cells (on one side) & juxtaglomerular cells (on the other side)**
 - ❖ **They act as supporting cells**
 - ❖ **Act as relay between macula densa to granular cells**

- **They also show granulation to secrete renin in conditions of extremely hyperactivity**
- **They also secrete various substances, and take up immune complexes**

Functions

- **Secretion, storage & synthesis of RENIN**
- **Water & electrolyte balance**
- **Secretion of Erythropoietin**
- **Regulation of blood pressure**
- **Tubuloglomerular feedback**

Juxtaglomerular Apparatus

