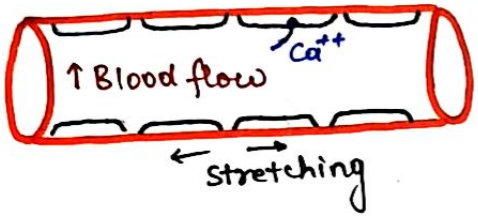
REGULATION of GFR

- Autoregulation
  - Myogenic mechanism
  - Tubuloglomerular feedback
  - High protein intake
- Mesangial cells

AUTOREGULATION mechanism :-

Change in Pressure (70 - 180 mm Hg) ⟹ GFR constt.

① Myogenic mechanism



stretching of vessel wall

↓

↑ movement of Ca^{++} ion from ECF to vascular SMC's

↓

combines with calmodulin & activation of myosin cross bridges

↓

contractions of vascular SMC's

↓

RBF restore

↓

GFR restore

③ High protein diet → ↑GFR ?

↑↑↑ Amino acids

↓

PCT :→ Na^+, AA reabsorption ↑↑
(coupled reabsorption)

↓

↓ NaCl reaches DCT

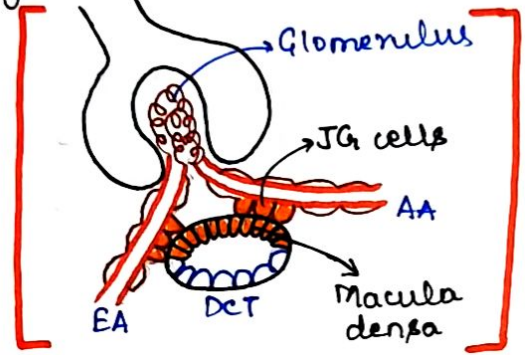
↓

Macula Densa & JG cells

↓

↑GFR

② Tubuloglomerular feedback :-



JG apparatus

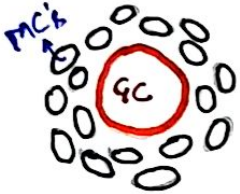
↓ Arterial pressure
↓
↓ GFR
↓
↓ NaCl

Macula Densa
↓
NKCC channel
↓
↓ ATP hydrolysis
↓
↓ Adenosine
↓
AA dilatation
← GFR normal

JG cells of AA & EA
↓
Renin
↓
Angiotensinogen $\xrightarrow{R}$ AI
↓
AI $\xrightarrow{ACE}$ AII
↓
EA constriction
↓
P_c↑ → GFR normal

Mesangial cells

↳ Cells surrounding GC's



Case I :-

Constriction of MC's

↓

compresses GC

↓

Less Blood through GC's

↓

↓ GFR

Agents responsible for constriction of MC's :-

- Endothelin
- Angiotensin II
- Nor-epinephrine

Case II :-

Dilatation of MC's (Relaxation)

↓

Expands GC's

↓

More blood through GC's

↓

↑ GFR

Agents responsible for relaxation of MC's :-

- NO
- Natriuretic peptide
- Dopamine
- cAMP