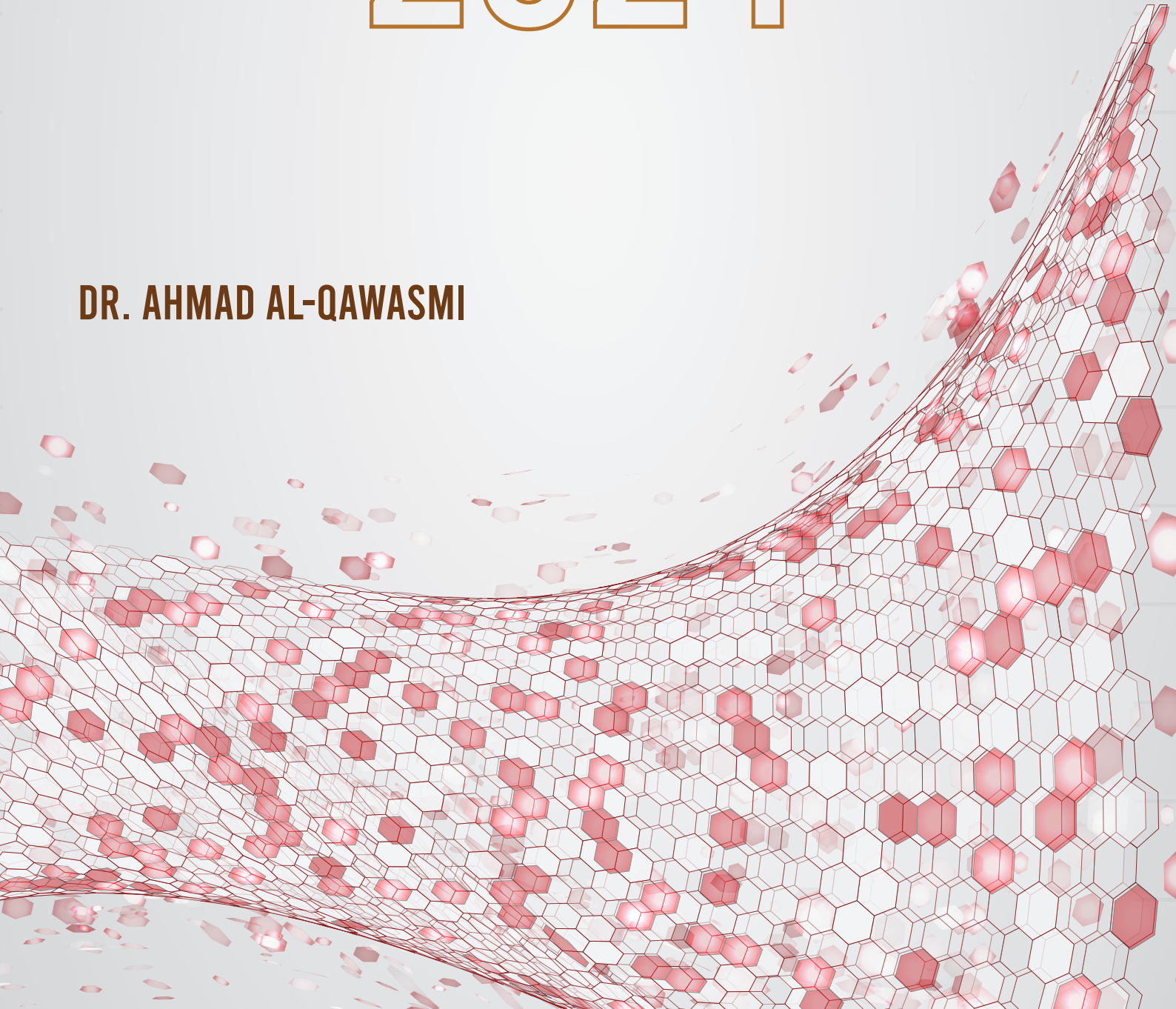


# HISTOLOGY

# 2024

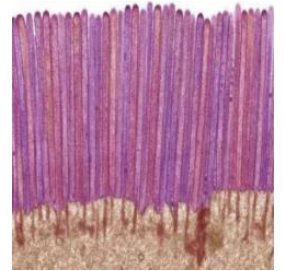
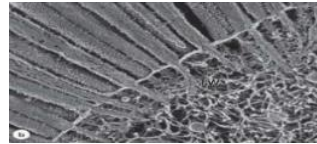
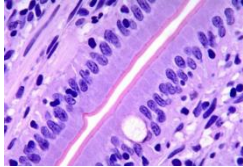
**DR. AHMAD AL-QAWASMI**



## ❖ Specialized apical structures

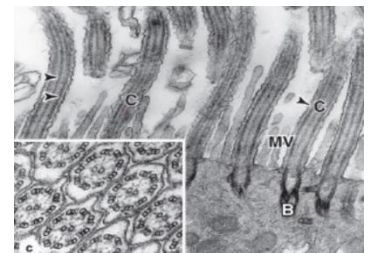
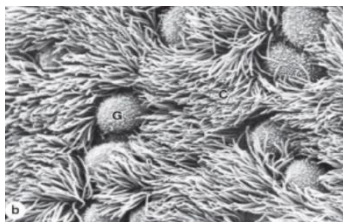
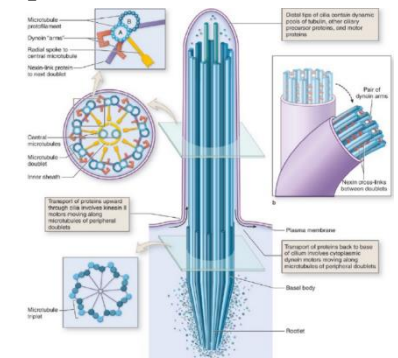
### • Microvilli

- Finger-like extensions (1  $\mu\text{m}$  long and 0.1  $\mu\text{m}$  wide) of plasma membrane of apical epithelial cell
- Contains bundled actin filaments capped and bound to the surrounding plasma membrane by actin binding proteins
- *Increase the surface area* for *absorption*
  - ✓ Present mainly in absorptive cells (columnar/cuboidal)
  - ✓ Main function is the absorption of nutrients from *intestines* (Striated border) and glomerular filtrate (Brush border in the *kidney*)



### • Cilia

- *Motile* cytoplasmic hair like projections *move fluid and particles along epithelial surfaces*
  - ✓ Line cells in the respiratory organs, uterine tubes, and efferent ducts in testes
  - ✓ They move rhythmically and rapidly in one direction aided by *motor proteins*
- Abundant on cuboidal or columnar cells
- Each cilium has a core structure consisting of 9 peripheral microtubule doublets arrayed around 2 central microtubules (9 + 2) assembly which is called an *axoneme*
  - ✓ *A microtubule* of the doublet is composed of 13 tubulin dimers arranged in a side-by-side configuration
  - ✓ *B microtubule* is composed of 10 tubulin dimers and shares the remaining dimers with those of the A microtubule
  - ✓ The *dynein* arms extend from the A microtubule and make temporary cross-bridges with the B microtubule of the adjacent doublet and they are motor proteins that require ATP
- The basal body is anchored by the striated rootlet within the cell cytoplasm
  - ✓ Cross section of the basal body shows the arrangement of nine microtubule triplets



### • Stereocilia

- Least common type
- They are similar to microvilli BUT longer
- *Branched*
- Contains arrays of microfilaments (actin) and actin-binding proteins.
- Found in epididymis and ductus deferens (males)
- They have an *absorptive* function
- In the internal ear they have a *sensory function* (detection of motion)

