CRC for Premium Quality Wool

# Stages in the Formation of the Cortex

Produced for the CRC for Premium Quality Wool undergraduate program by;
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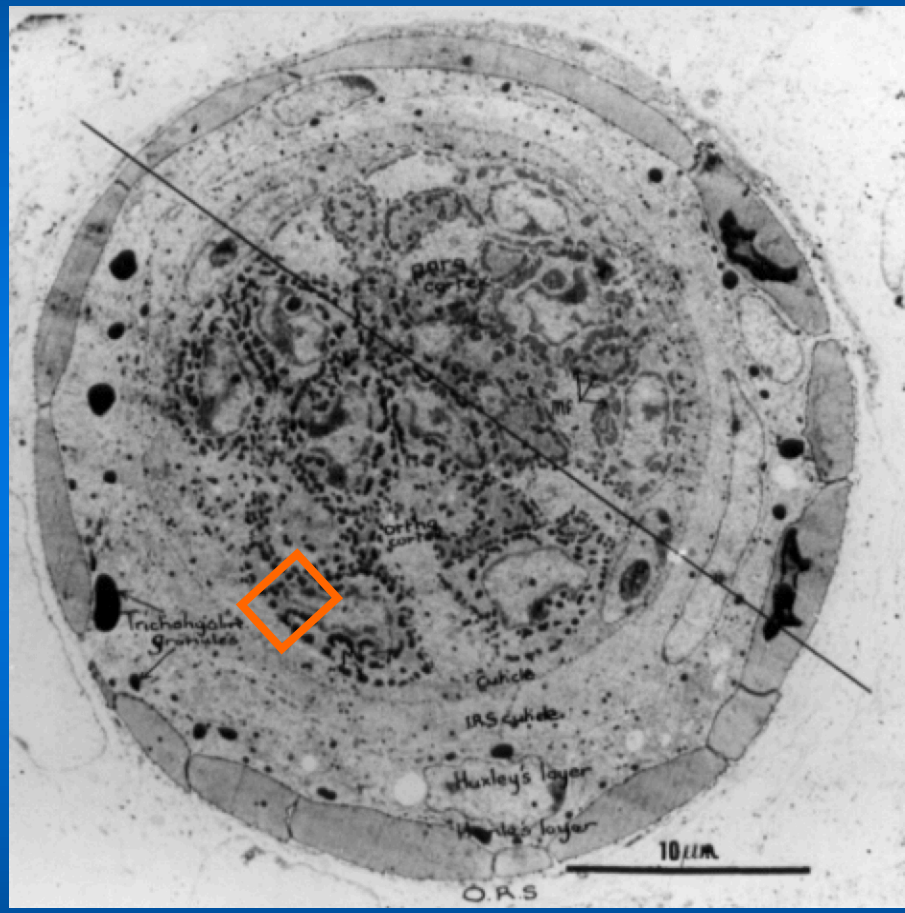
# TEM micrograph of fine wool follicle at the apex of the papilla

- cellular differentiation visible
- presumptive ortho and para cortical cells visible
  - orthocortical cells are more darkly stained

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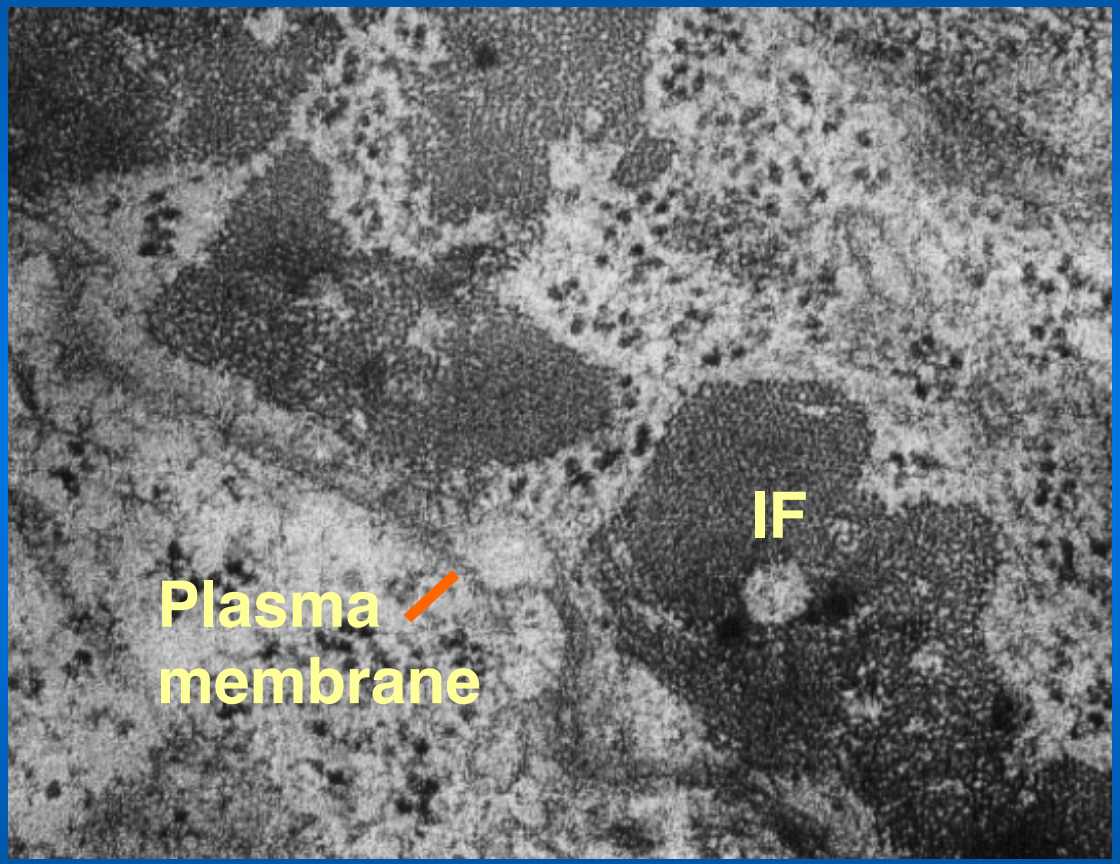
# Higher magnification of paracortex

- keratin structural components
  - the intermediate filaments (IF)
- hexagonal packing of IF

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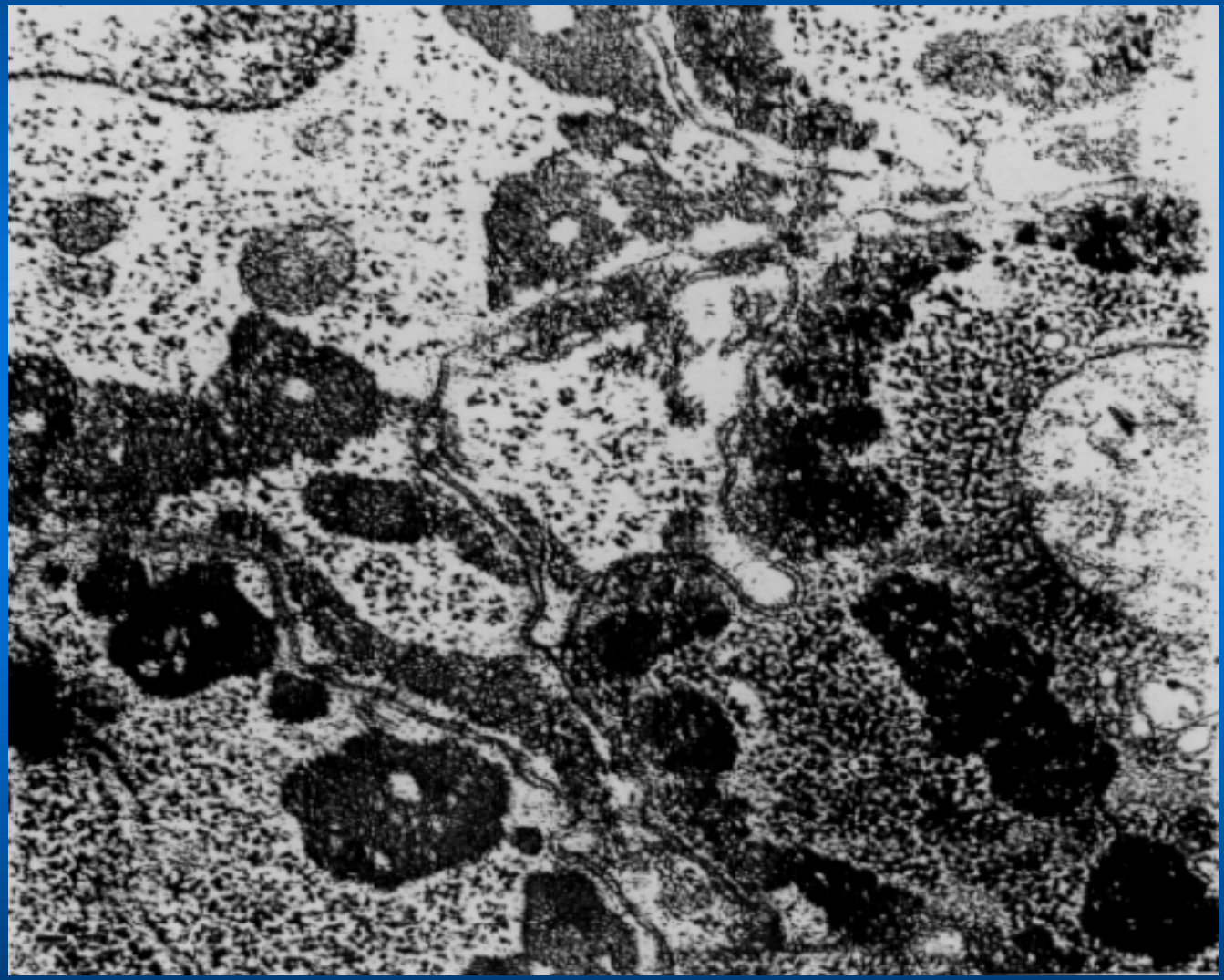
# Further up follicle

dark staining matrix proteins associated with IF



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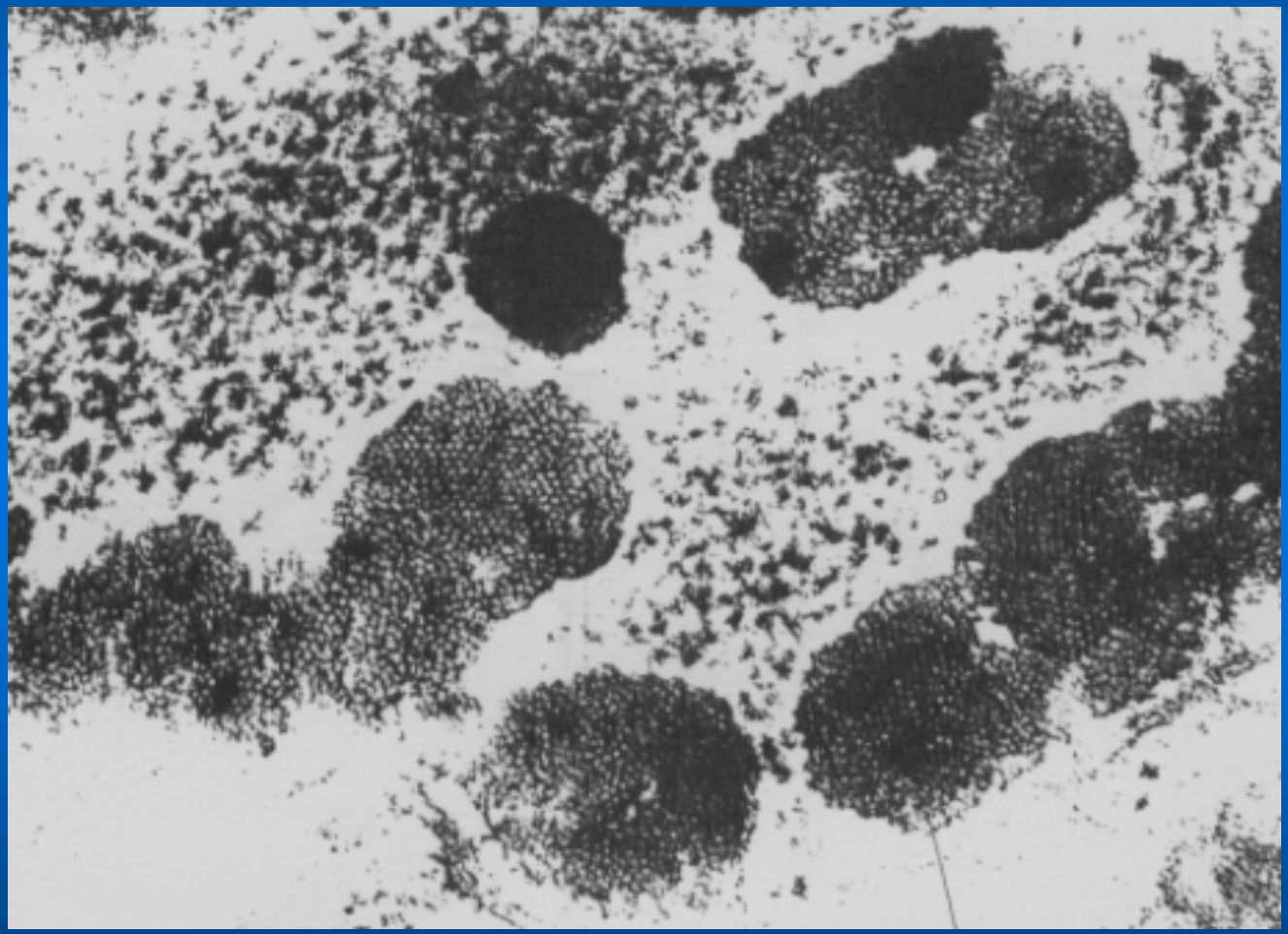
# Even further up the follicle

dual synthesis of IF and matrix



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# Summary

- Three major steps in cortex formation
  - Keratin protein synthesis
    - formation of IF/matrix composite occurs in a 2-stage process
      - importantly, the IF's are synthesised before matrix
  - Assembly of molecules into intracellular structural components
  - Structural components form keratin complex
    - IF/matrix
    - stabilised through formation of 3-D cross-linking
      - major bonds are disulfide
    - at terminal stages of cortex formation 'filler' proteins are synthesised which occupy regions between cell membrane and IF/matrix