Stages in the Formation of the Cortex

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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
Higher magnification of paracortex

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

dark staining matrix proteins associated with IF
Even further up the follicle

dual synthesis of IF and matrix
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