Epithelial-mesenchymal Interactions in the Developing Follicle

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Skin recombination experiments

Mouse epidermis
(hair growing region or foot pad)

Cell aggregations
Follicle placodes
Downgrowths

Mouse dermal mesenchyme
(dorsal hair growing region)

Mouse epidermis
(hair growing region)

Mouse dermal mesenchyme
(non-hair growing region)

No follicle placodes

Chick epidermis

Feather placodes

Lizard epidermis

Scale placodes
Later stage recombination experiments

- Only mouse dermal cells will respond to form a mouse plug.
- Once the plug is formed, the dermal papilla is required to stimulate the hair matrix cells to divide rapidly.
Tissue interactions in the hair follicle bud

First dermal message
“Make an appendage”

Second dermal message
“Make a follicle”

Epidermal message
Epithelial-mesenchymal messages

• There are messages present in the skin
  – they are ordered and pass back and forth between the epidermis and dermis

• The messages become more specific as development progresses

• These messages are the basis of the epidermal-mesenchymal (E-M) interactions.