The lateral sides of most epithelial cells, mainly those involved in ion transport, are not linear. They have **basolateral folds** to increase their surface area. These are associated with mitochondria and found mostly in secretory glands and renal tubule cells.

Stereocilia are found in **outer hair cells** in the ear. Outer hair cells are responsible, in part, for hearing. These specialisations contain actin, similar to microvilli, rather than microtubules. They differ between themselves in terms of size and length. They do not move, but can bend from fluid moving. When the outer hair cells degenerate or their nuclei change positions (the nuclei should be basal) as a result of loud music or other such things, hearing loss occurs.

Cell-to-cell junctions are found on the lateral surface of epithelial cells.

- **Tight junctions** or **Zonula occludens** (ZO) maintain the seal between cells and are found near the top of the lateral sides. They are very thin.
- Adherens junctions or Zonula adherens (ZA) attach adjacent cells to each other via their cytoskeleton (actin filaments).
- **Desmosomes** or **Macula adherens** connect cells tightly via the cytoskeleton to strong keratin filaments. Desmosomes are very pronounced in the skin and their degeneration in the case of sunburn causes skin to peel.
- **Gap junctions** allow cell-to-cell communication using small substances. Gap junctions are found in cells that require constant communication to function, such as those involved in the contraction of smooth muscle in the gut and vasculature, or in cardiac muscle, as well as epithelia involved in fluid and electrolyte transport. The proteins in gap junctions are called **connexins** and allow the regulation of pure opening.

Hemidesmosomes are found on the basal surface. They acchart the epithelium to the basement membrane, thus providing structural support. A substance called BP230 involved in anchoring causes skin blisters if it is detached. Frectin is another substance that has the same effect, alongside muscle loss

Haematoxylin stuhs haclei purple, and e ben stains proteins pink. Together, these substances make up **H+E staining**. A substance called PAS (periodic acid-Schiff) stains glycoproteins. In an H+E staining, white sections signify glands. In PAS staining, a clear line represents the basement membrane.

The basement membrane has a structural purpose. It serves as a point of attachment for epithelial cells, isolates them from connective tissue, filters substances, and provides a scaffolding for epithelia to grow across in tissue repair. This scaffolding function becomes apparent if the basement membrane is destroyed in a wound such as a burn, which takes considerably longer to heal than if it was not destroyed. The basement membrane is also important in cell signalling, providing growth factors for cells.

Exocrine glands secrete their product via a duct (simple glands have a single duct, compound glands have a branched duct). **Endocrine** glands are ductless and secrete their product (hormones) directly into the bloodstream. The following are types of exocrine glands:

- **Merocrine** glands function by fusing the vesicles containing their product with the plasma membrane so that the product is released. This is an example of **exocytosis**.
- **Apocrine** glands release their product in membrane-bound vesicles surrounded by cytoplasm and plasma membrane.
- **Holocrine** glands work by shedding the whole cell containing the product after programmed cell death (sebaceous glands in the skin are holocrine).

Endocrine glands also use exocytosis, after which the product diffuses directly into the bloodstream.