PRELIMINARY AND SHORT REPORT

"THE EPIDERMAL ECCRINE SWEAT DUCT UNIT"

A Morphologic and Biologic Entity* †

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The "Epidermal Sweat Duct Unit" is a term we have chosen to name a morphologic and biologic entity in human skin that includes A) the intraepidermal portion of the sweat duct (the single layer of lining cells), B) the periductal sheath of two or more epidermal cells concentrically arranged around the lining cells of the duct, and C) the eccrine sweat pore. Evidence for this "unit" concept was presented by Pinkus[1] and further substantiated by our studies (J. B. H. & W. C. L., Jr.).[2] The following preliminary histochemical studies of human epidermis now add more support to the concept that this "epidermal sweat duct unit" is a biological entity within the epidermis and that its cells behave differently from the adjacent epidermal cells.

A. The epidermal portion of the sweat duct (the single layer of lining cells):
   1. In the deeper portion of the "unit" the cytoplasm of these cells is rich in glycogen.
   2. Using the Hotchkiss-McManus[3] technic the free (luminal) portion of these lining cells contains Schiff-positive material that is not removed by digestion with saliva or diastase.
   3. This Schiff-positive material is present as an innermost lining of the lumen. It is maintained intact through the granular zone and stratum corneum to the sweat pore.
   4. The disulfide and sulfhydryl[4] concentration of the lining cell is greater than in the Malpighian cells of epidermis. These concentrations are heaviest in the distal (luminal) half of the lining cell.
   5. The nuclei are more basophilic (Toluidine Blue buffered at pH 5) than those of the mid-epidermis.

B. The periductal sheath of two or more epidermal cells concentrically arranged around the lining cells of the duct.
   1. The cytoplasm and intercellular bridges of the sheath cells are rich in glycogen in that portion of the unit lying deep to its granular zone.
   2. The disulfide and sulfhydryl concentrations of these "sheath epidermal cells" are lower than in the adjacent epidermal cells.
   3. Their cytoplasm has an increase in metachromatic dust (Toluidine Blue stain buffered to pH 5) over the adjacent epidermal cells.

C. The eccrine sweat pore (the eccrine sweat duct opening on the surface of the skin).
   1. The lumen is encircled by the "keratin ring" of O'Brien.[5] This keratin ring is rich in disulfide concentration (stains blue)[4] in amounts similar to the adjacent stratum corneum.

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2. Within the keratin ring and lining the lumen of the pore is a condensed ring of Schiff-positive, saliva-resistant material that is continuous with the Schiff-positive material lining the lumen of the duct. For the time being we would like to refer to this structure as "the hyalin ring."
3. This hyalin ring is weaker in disulfide concentrations (stains pink) than the keratin ring.
4. This hyalin ring is sometimes metachromatic when stained with Toluidine Blue buffered at pH 5.

Studies are in progress concening the origin, growth center, morphogenesis and function of this "Epidermal Eccrine Sweat Duct Unit" and its component parts.

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