

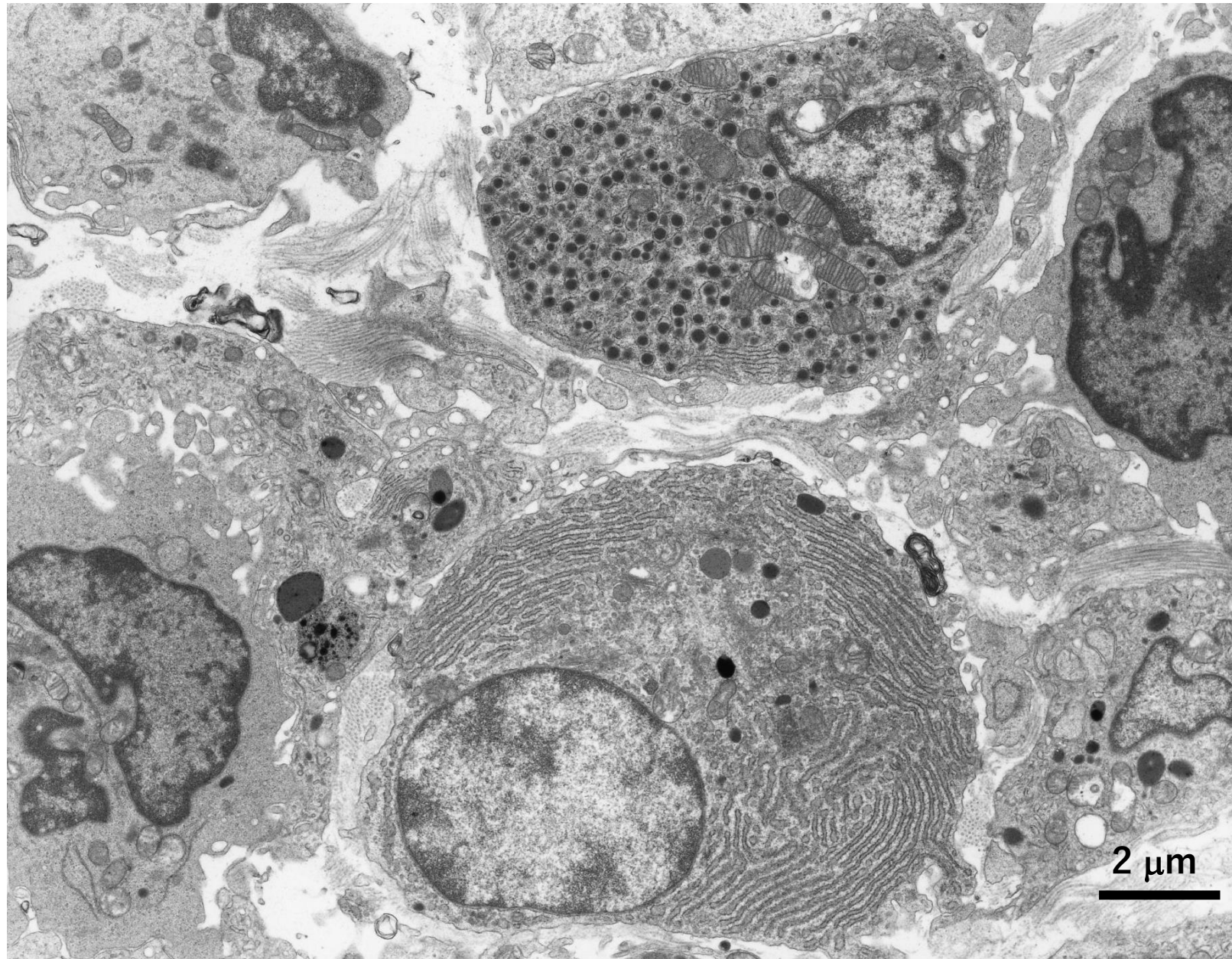
# Normal Merkel cells seen in the skin and mucosa

- Merkel cells are sensory or neuroendocrine cells distributed in the basal layer of the normal epidermis and squamous mucosa. The round-shaped mechanoreceptor cells receive touch sensations. The immunohistochemical markers are common with neuroendocrine cells in the columnar mucosa, such as synaptophysin, chromogranin, CK7 and CK20. Via Merkel cell-neural process complexes (Merkel nerve endings), they connect with afferent sensory nerves.
- Merkel cell carcinoma is a representative neuroendocrine carcinoma of the skin and squamous mucosa, mainly occurring the facial skin of the elderly. It also occurs in the squamous mucosa such as the tongue, vulva and anus. Merkel cell carcinoma resembles small cell lung carcinoma. Small neuroendocrine granules are observed under the electron microscope. Merkel cell polyomavirus is a causative DNA viral pathogen.

# Functions of Merkel cells

Merkel cells are responsive to slow adaptation response, in contrast to quick and sharp sensation mediated by sensory nerves. They respond to low frequency vibration at 5-15 Hz. Representative sensations via Merkel cells are as follows:

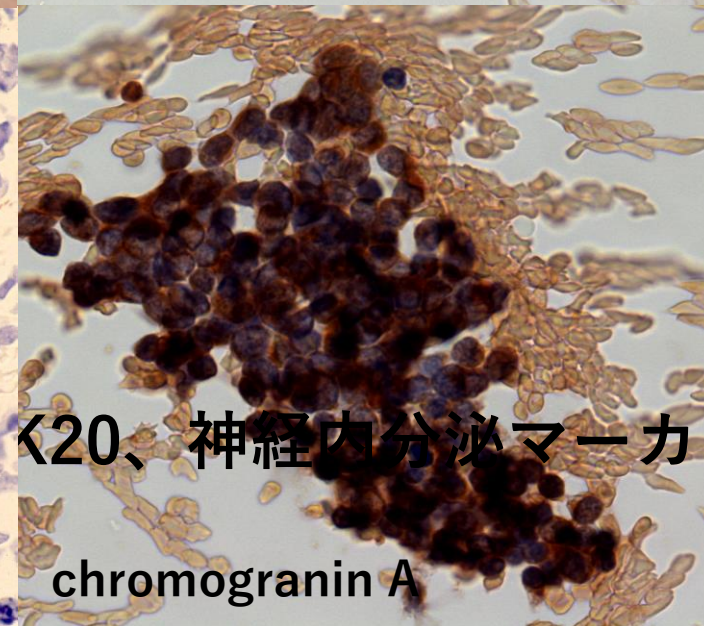
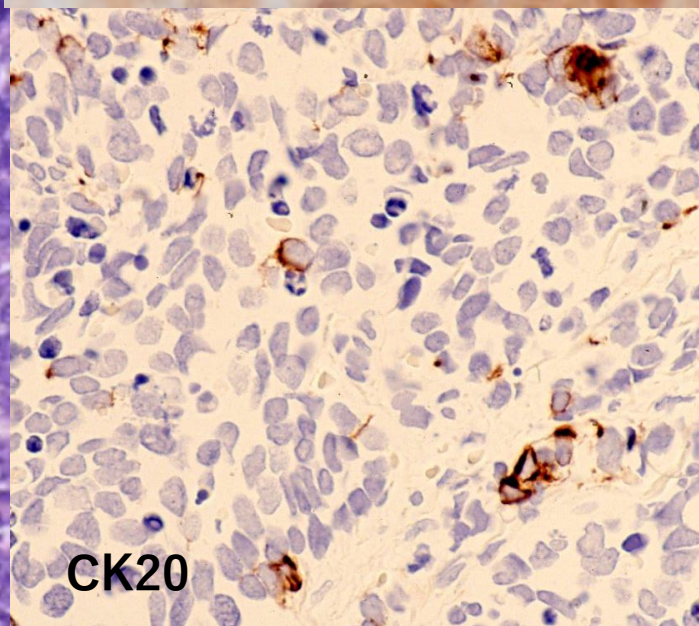
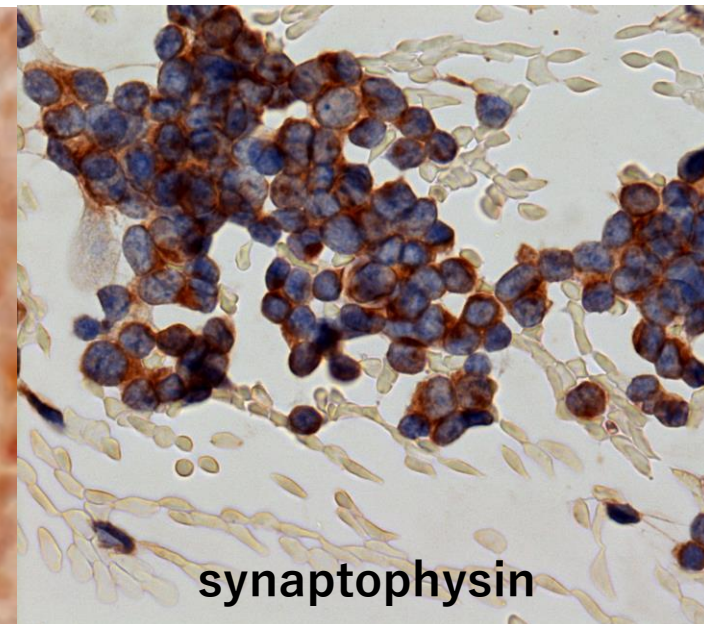
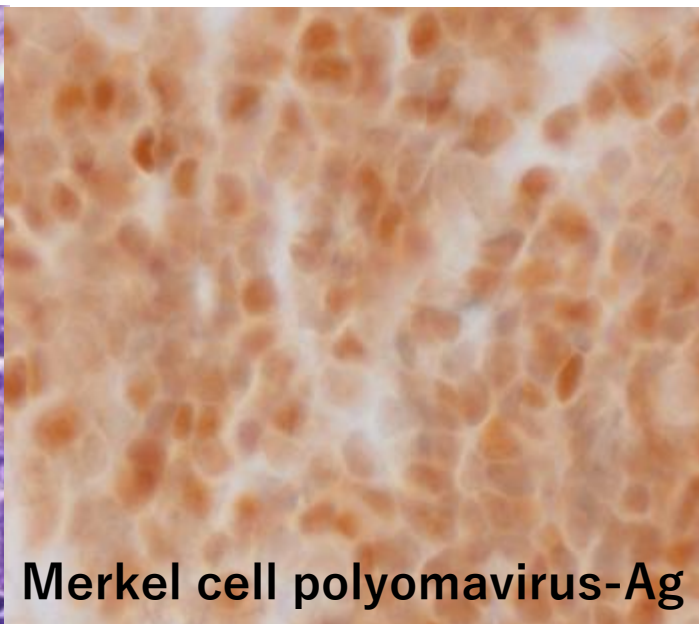
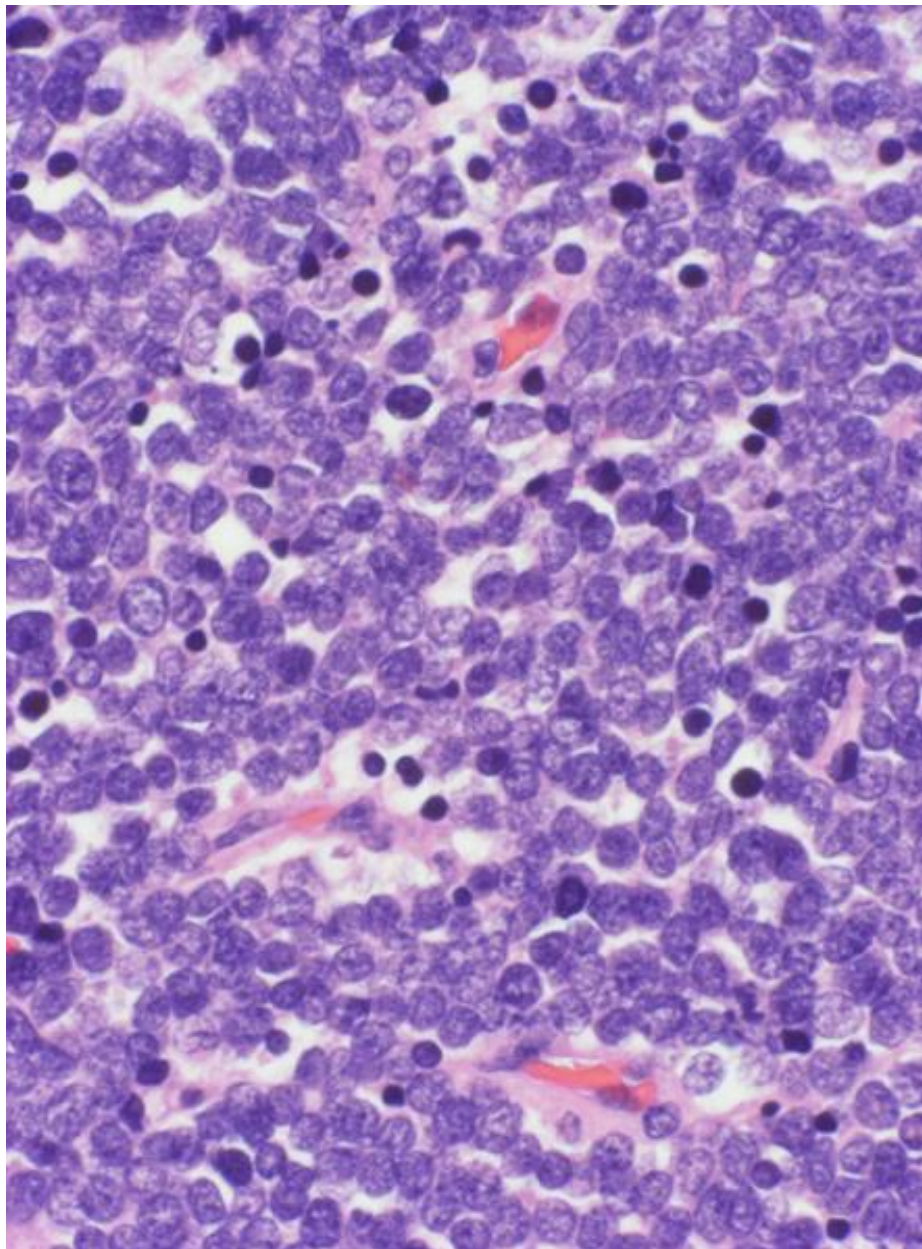
- 1) Tongue feels licking sensation
- 2) Finger feels delicate sensation
- 3) Breeze feels good
- 4) Kiss gives gentle feeling
- 5) Beer feels great going down
- 6) Sexual intercourse feels erogenous



Ultrastructure of normal Merkel cell found in the dermis. Cored neuroendocrine granules are observed in the cytoplasm. Macrophages and a plasma cell are also seen. EM

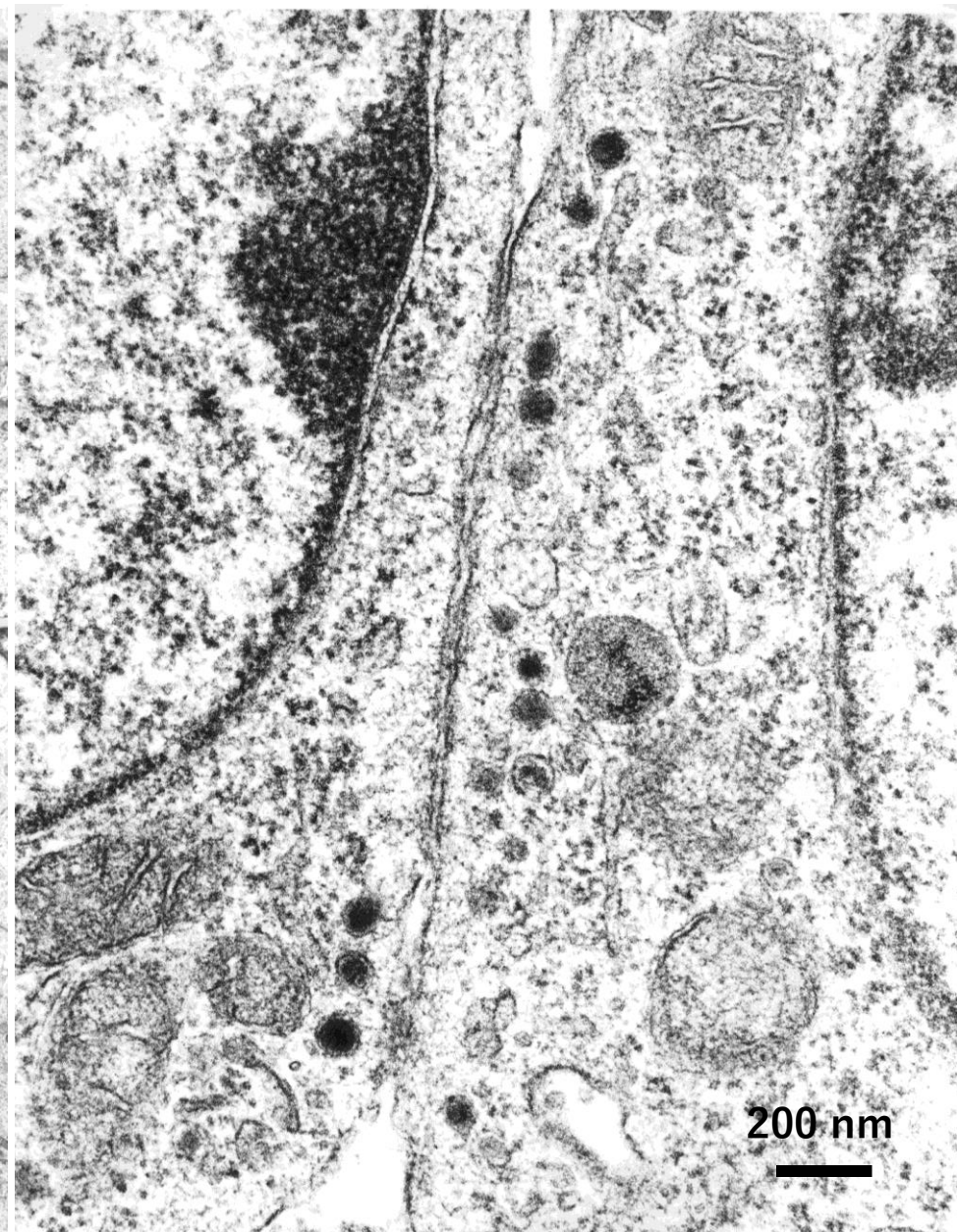
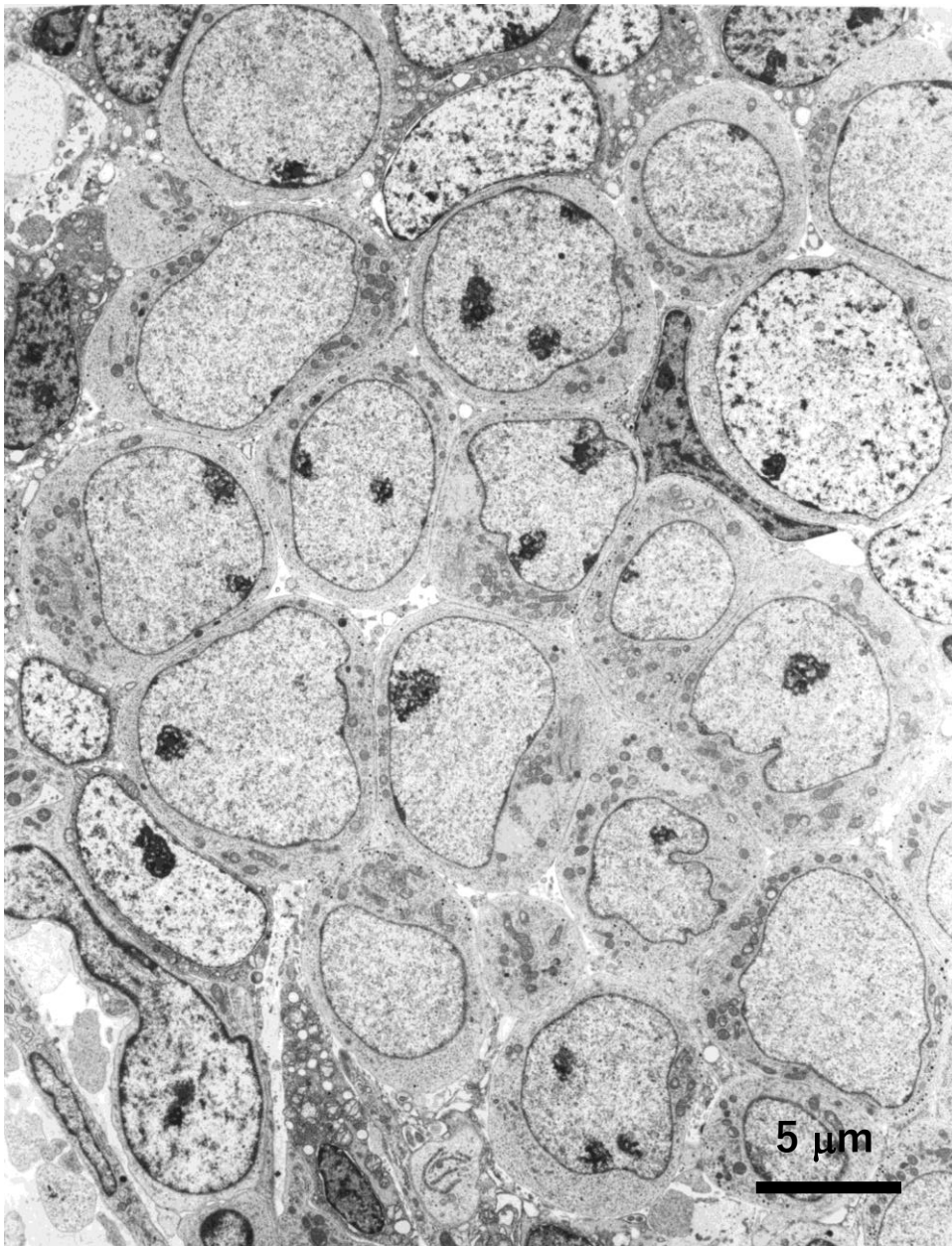


Gross appearance of Merkel cell carcinoma of the facial skin of the elderly. Invasion to the dermis is evident.

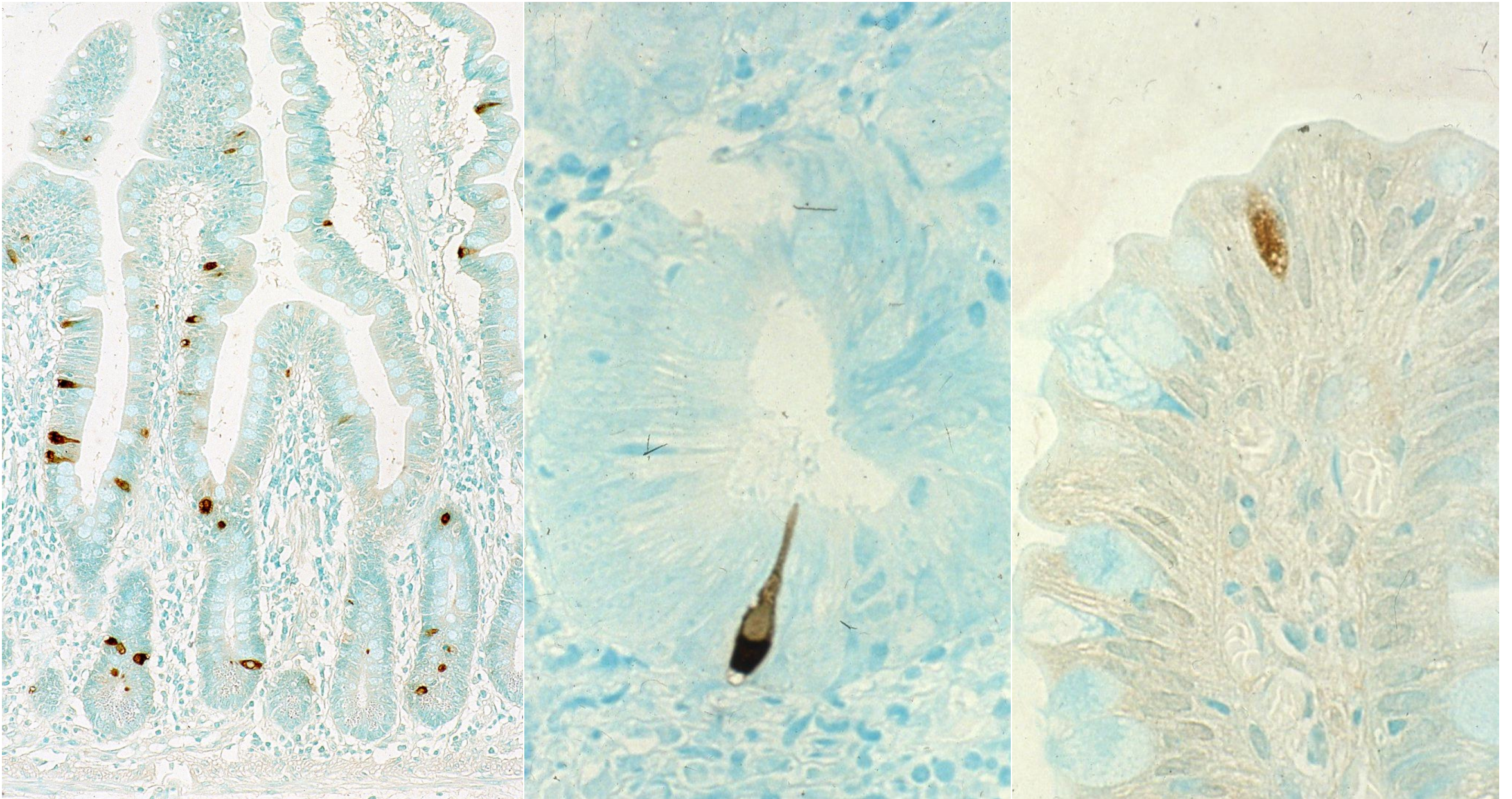


CK20、神経内分泌マーカー陽性

Merkel cell carcinoma consists of small-sized tumor cells. They express Merkel cell polyomavirus Ag, as well as neuroendocrine markers (synaptophysin and chromogranin A). CK20 is also expressed.

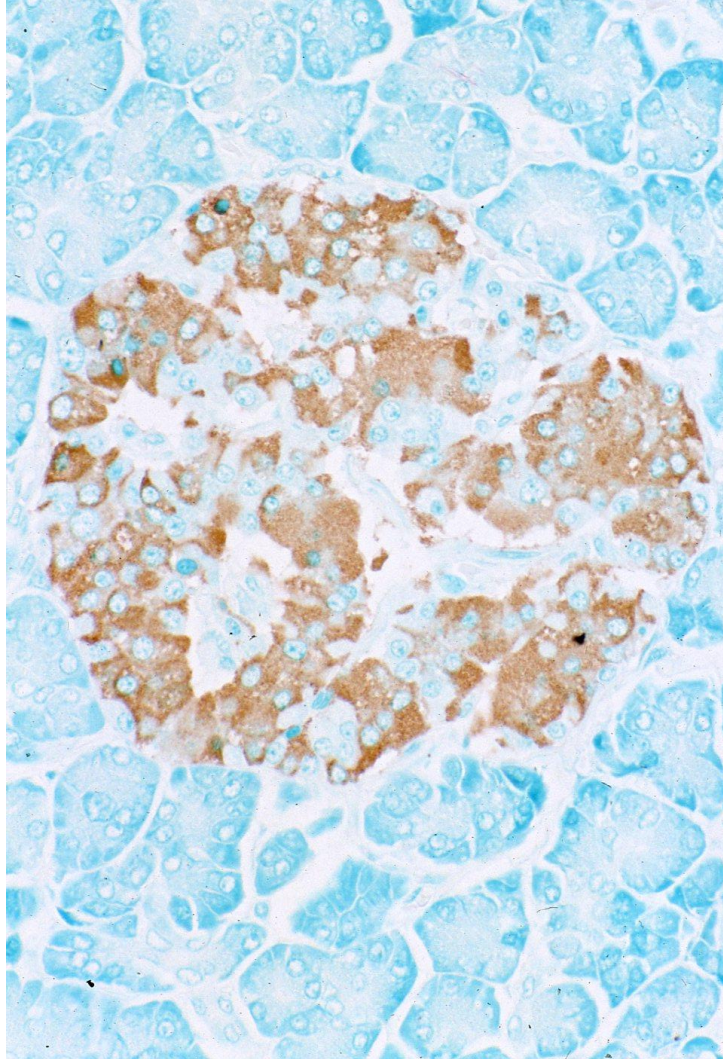


EM features of Merkel cell carcinoma. Small-sized cored neuroendocrine granules are dispersed in the cytoplasm. Homogeneous distribution of euchromatin in the nucleus is characteristic.

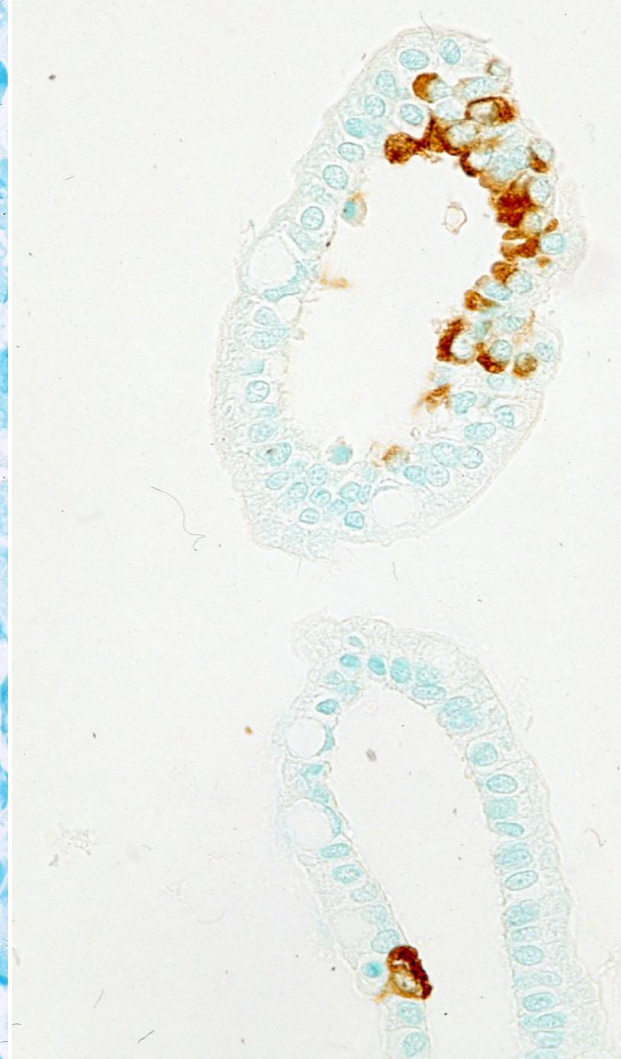


Neuroendocrine cells in the columnar mucosa. The duodenal mucosa contains isolated neuroendocrine cells immunoreactive for serotonin (left), somatostatin (center) and secretin (right).

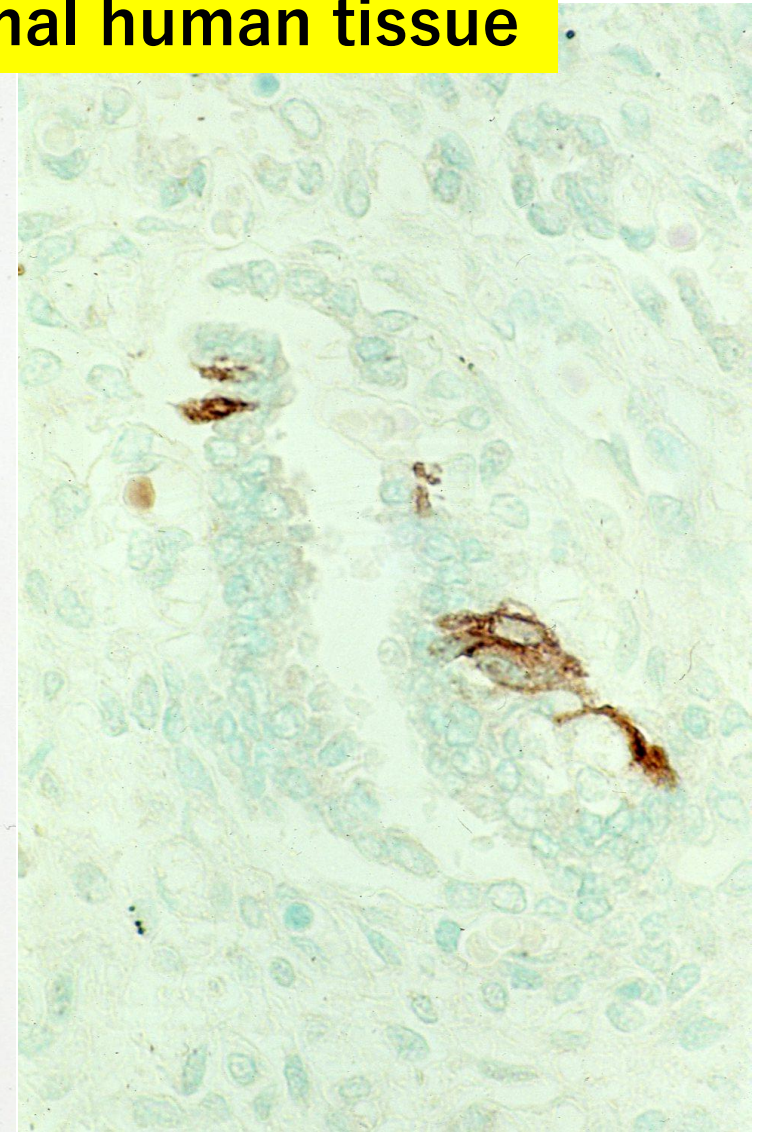
# Clusters of neuroendocrine cells in the normal human tissue



insulin in normal pancreatic islet

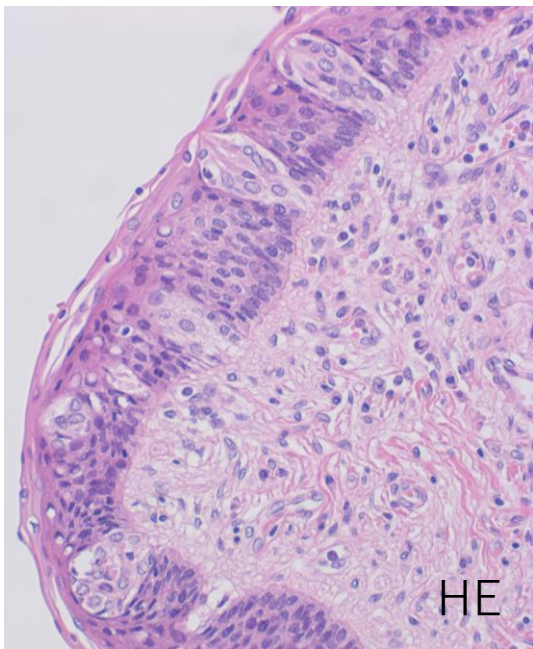


Segi's cap in fetal small bowel (chromogranin A)

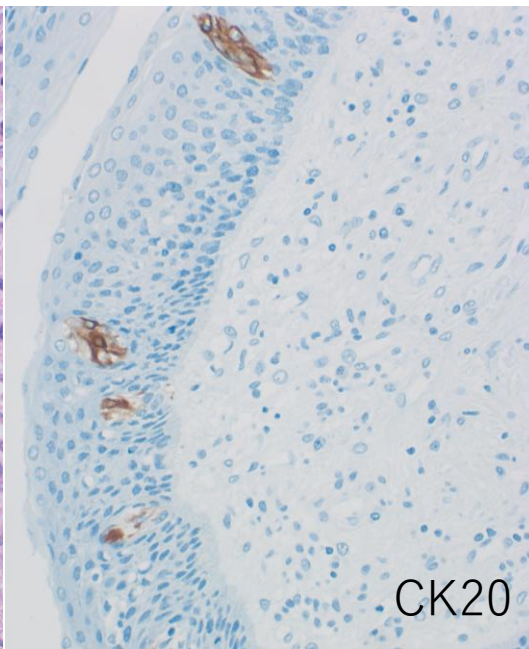


Neuroepithelial body in fetal lung (gastrin-releasing peptide)

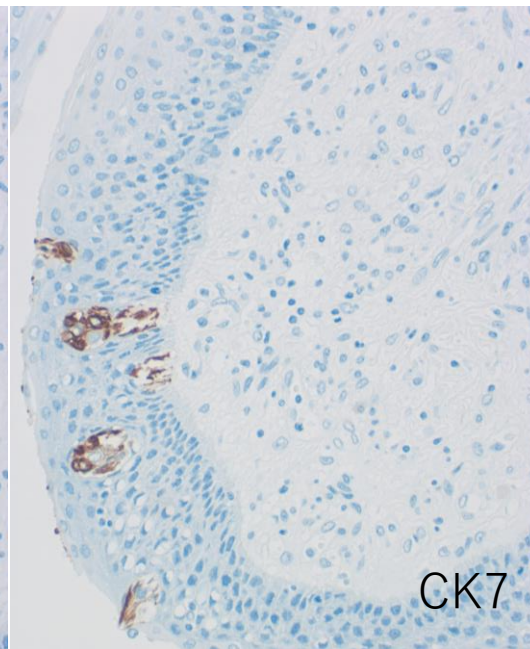




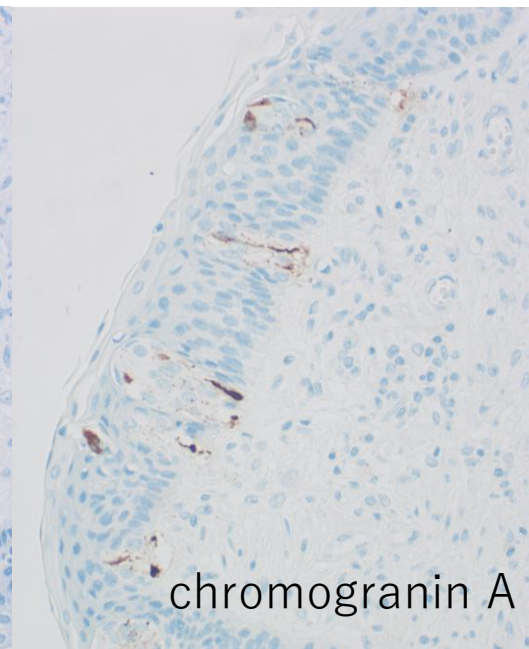
HE



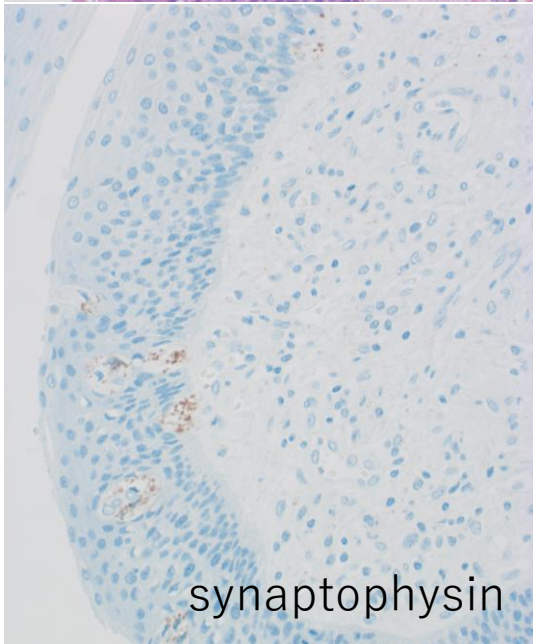
CK20



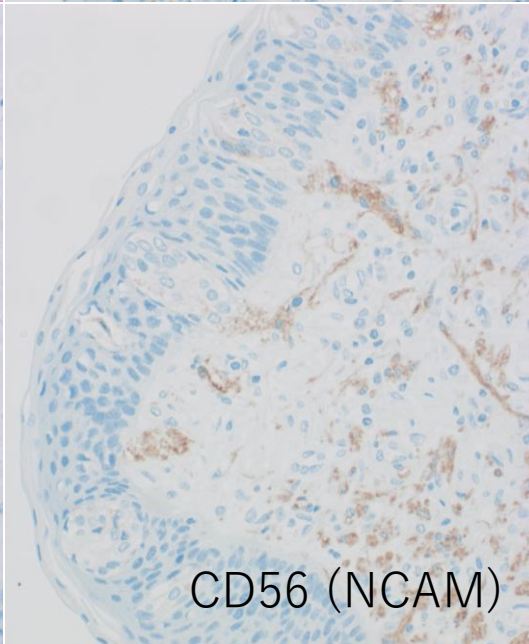
CK7



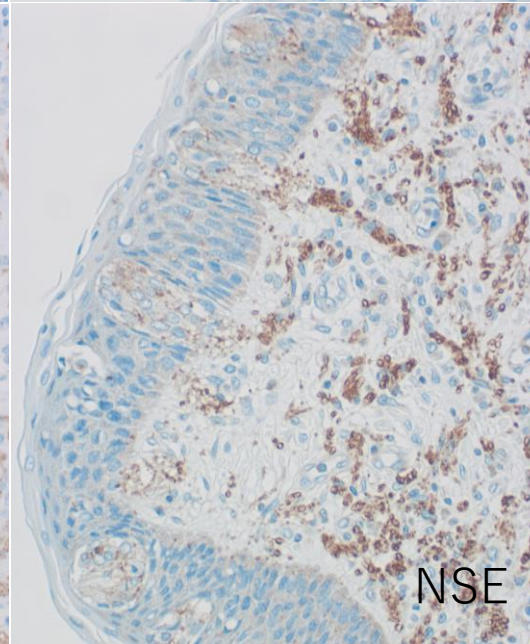
chromogranin A



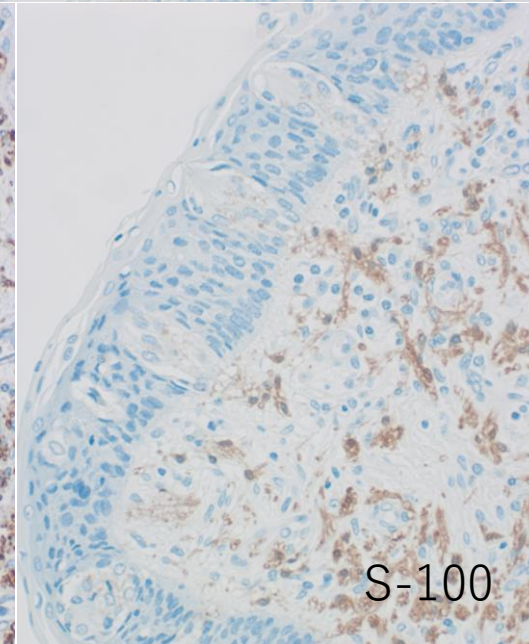
synaptophysin



CD56 (NCAM)



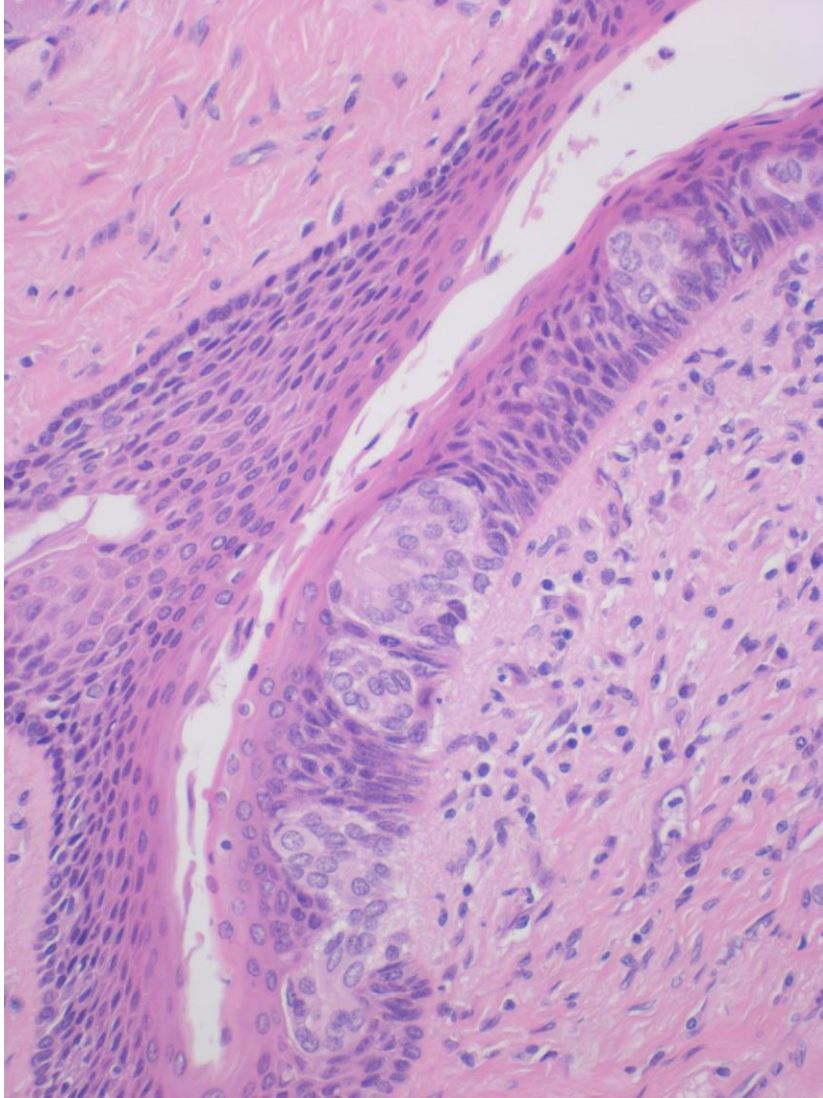
NSE



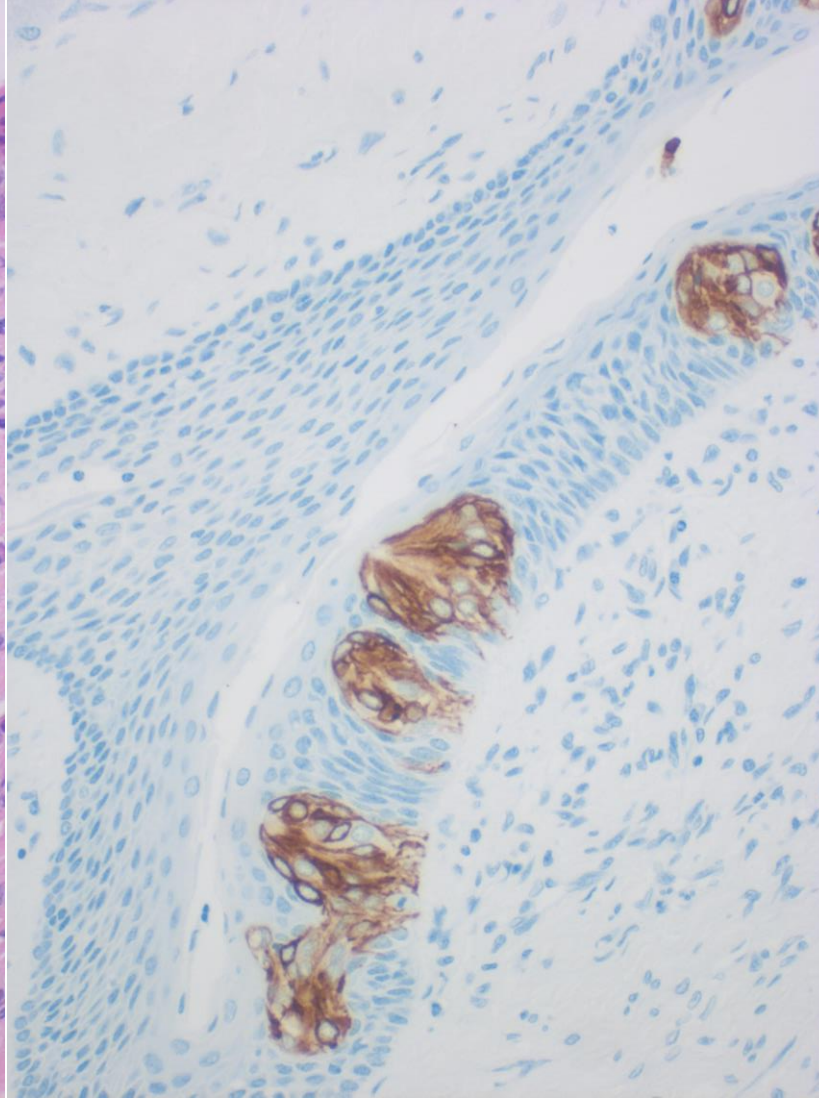
S-100

taste buds in vallate papilla of the tongue

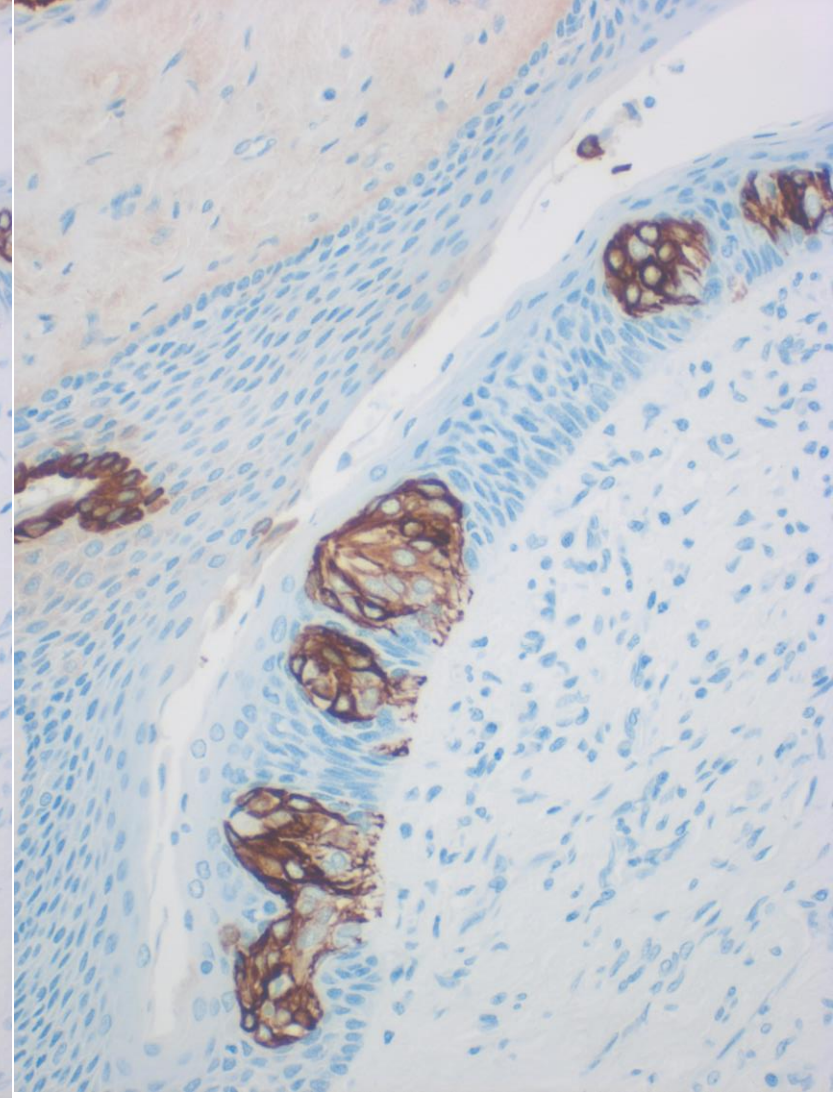
# Taste buds in vallate papilla of the tongue



H&E

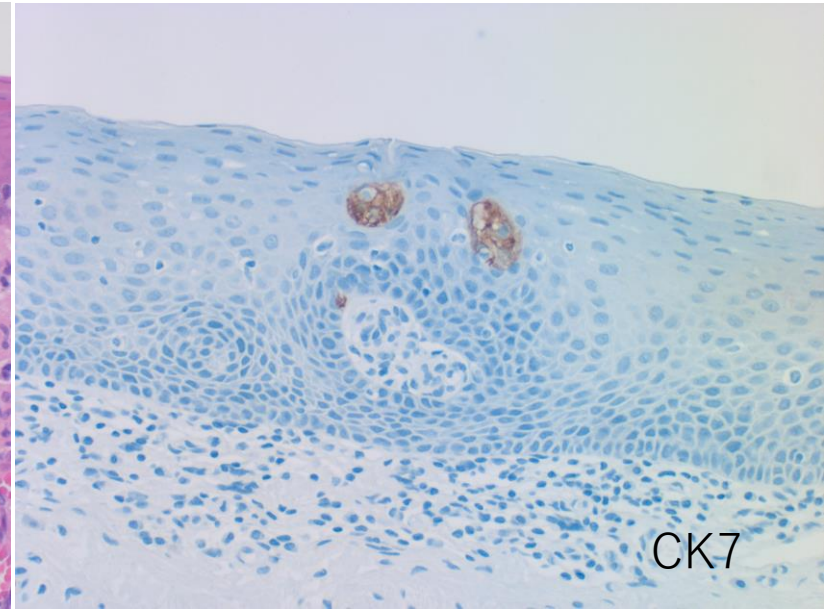
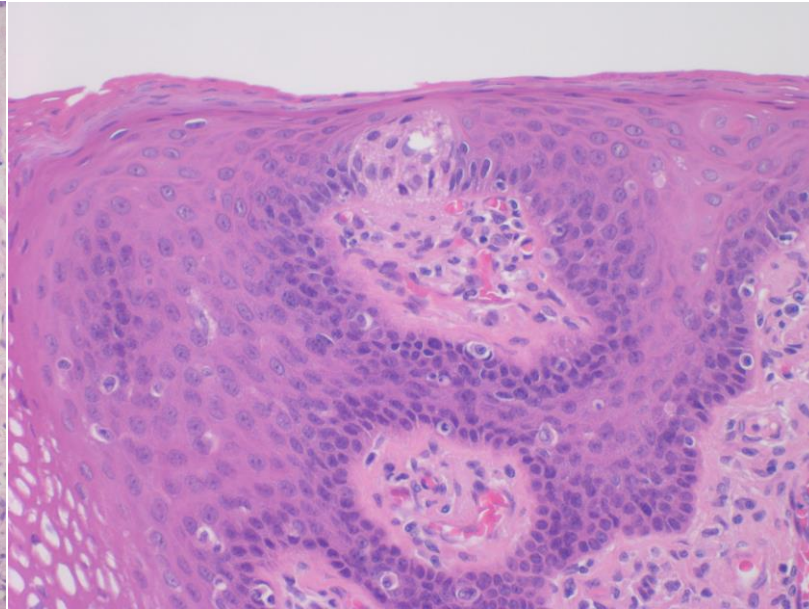
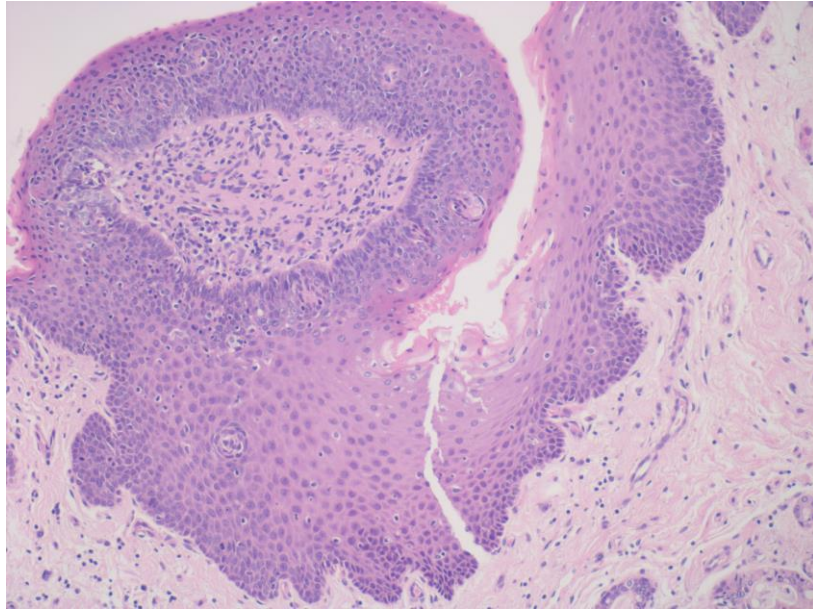


CK20

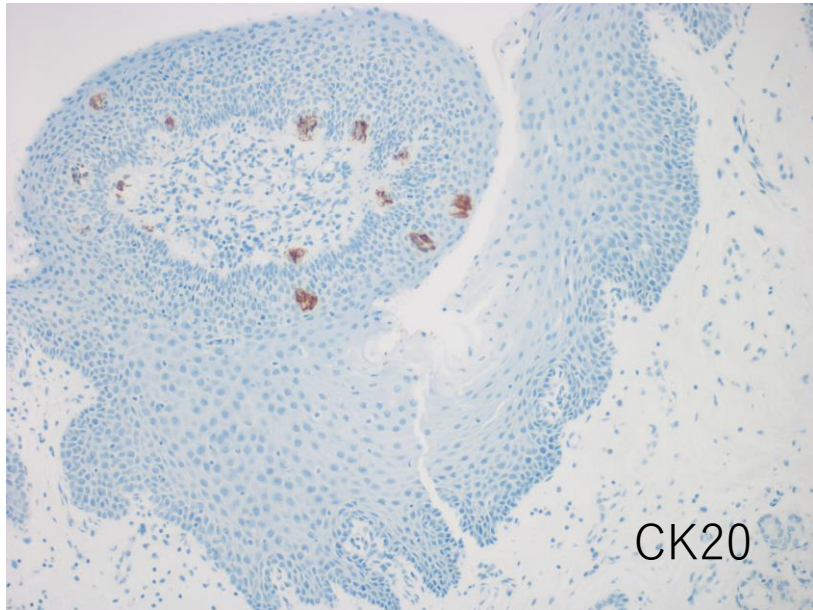


CK7

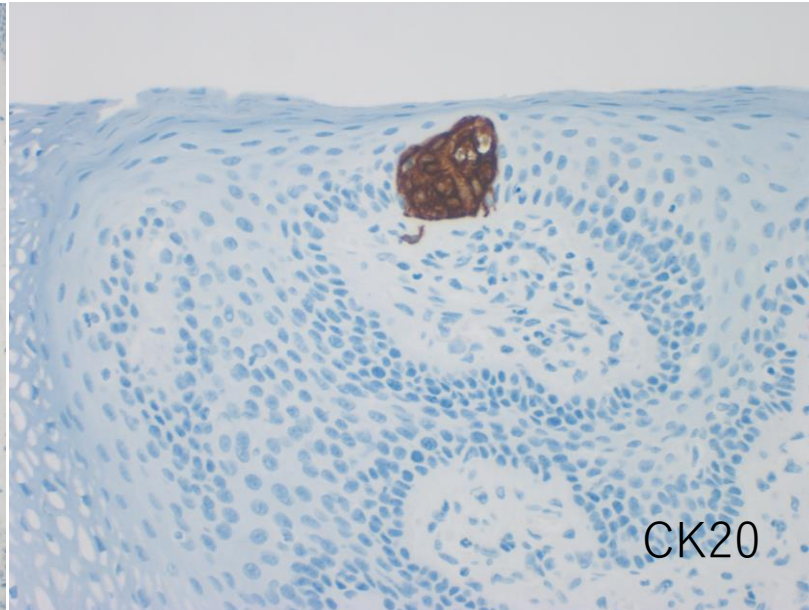
# Taste buds in other oral mucosa



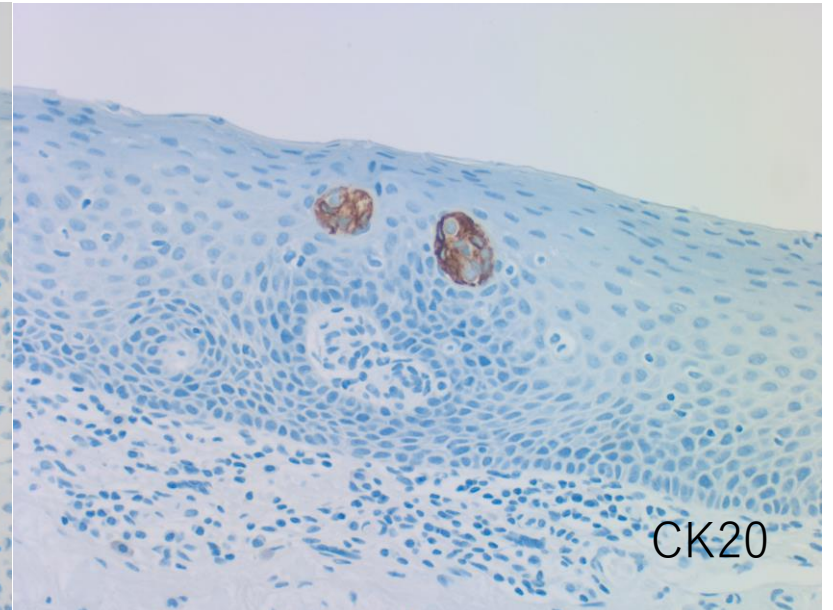
CK7



CK20



CK20



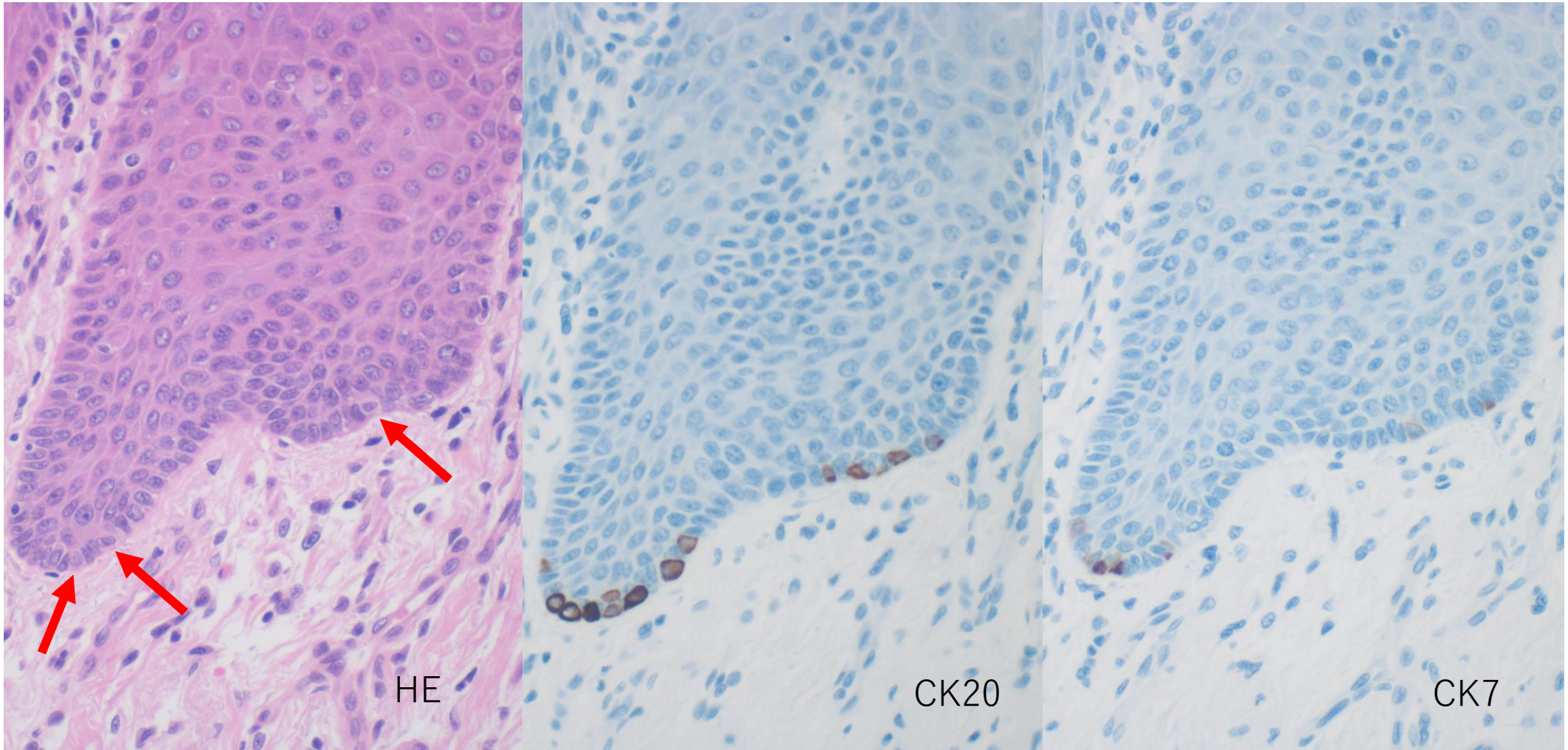
CK20

Foliate papilla of tongue

Filiform papilla of tongue

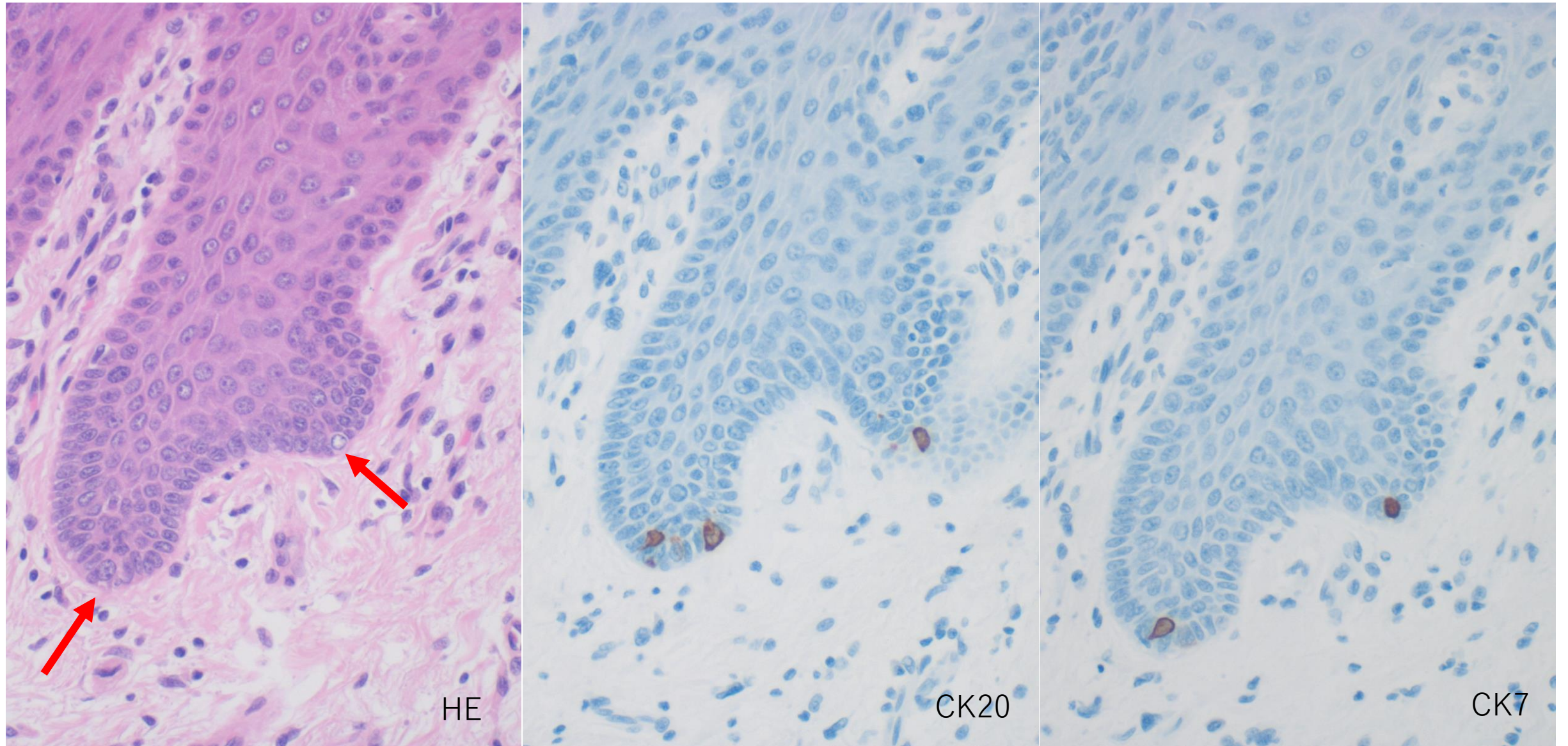
Tip of epiglottis

## Merkel cells in tongue mucosa (1)



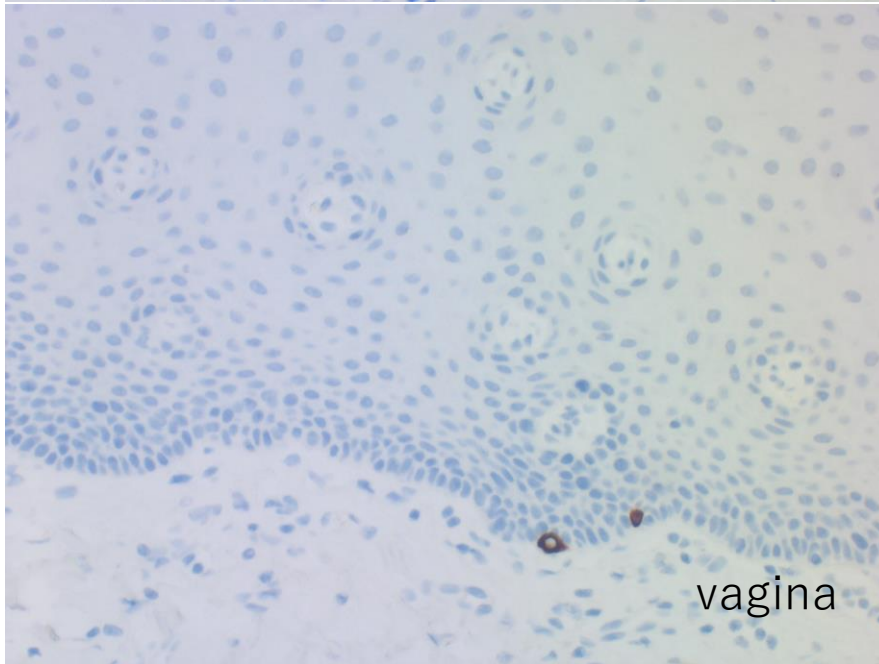
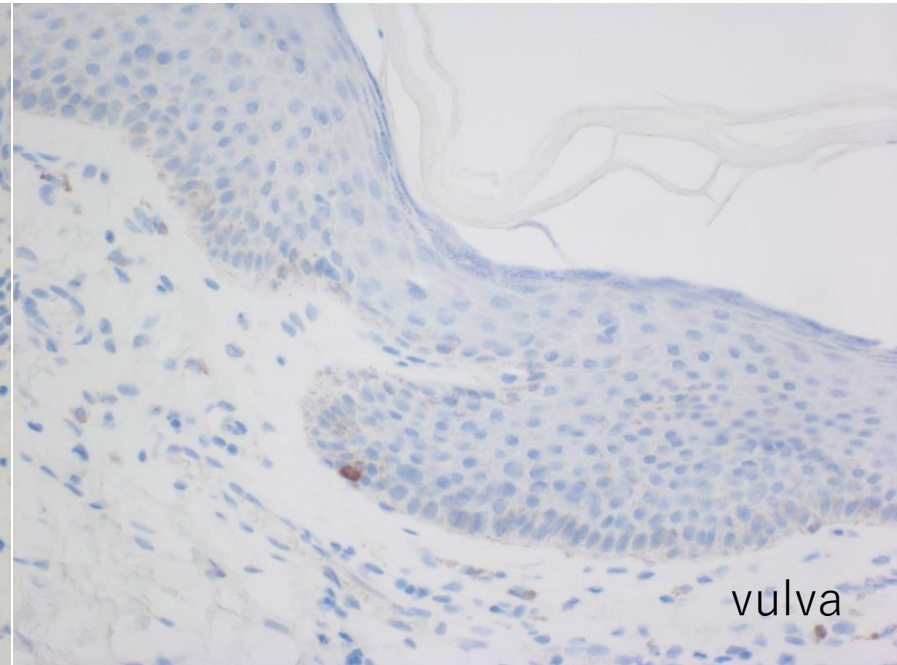
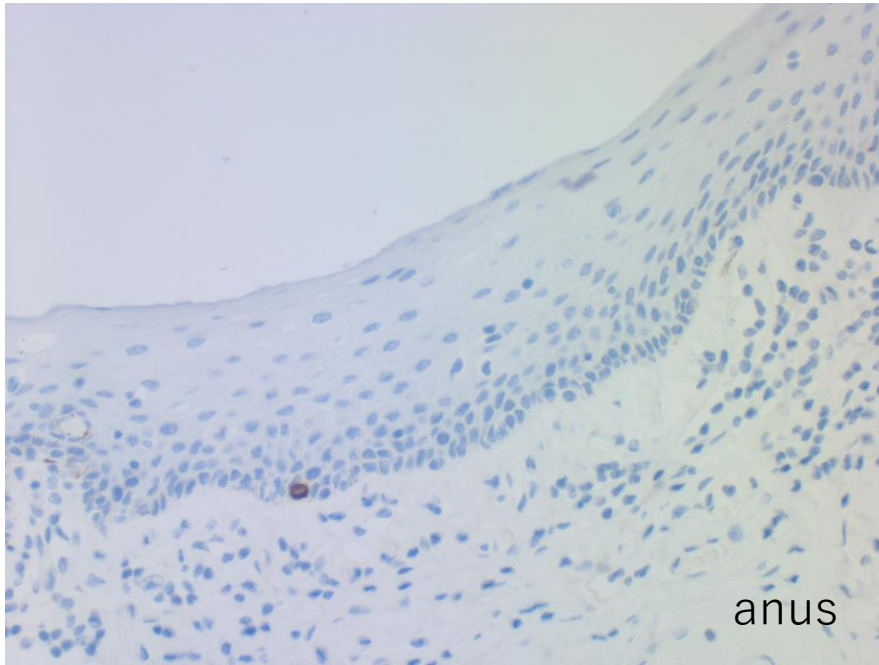
Merkel cells are located in the basal layer of the squamous mucosa of the tongue, particularly at the mucosal process, as isolated cells. They possess clear cytoplasm in H&E sections (arrows).

## Merkel cells in tongue mucosa (2)



Merkel cells at the basal layer of the squamous mucosa possess clear cytoplasm in H&E sections.

**CD20-  
positive  
Merkel  
cells in  
squamous  
mucosa  
(1)**



**CK20/CK7-  
positive  
Merkel  
cells in  
squamous  
mucosa(2)**

