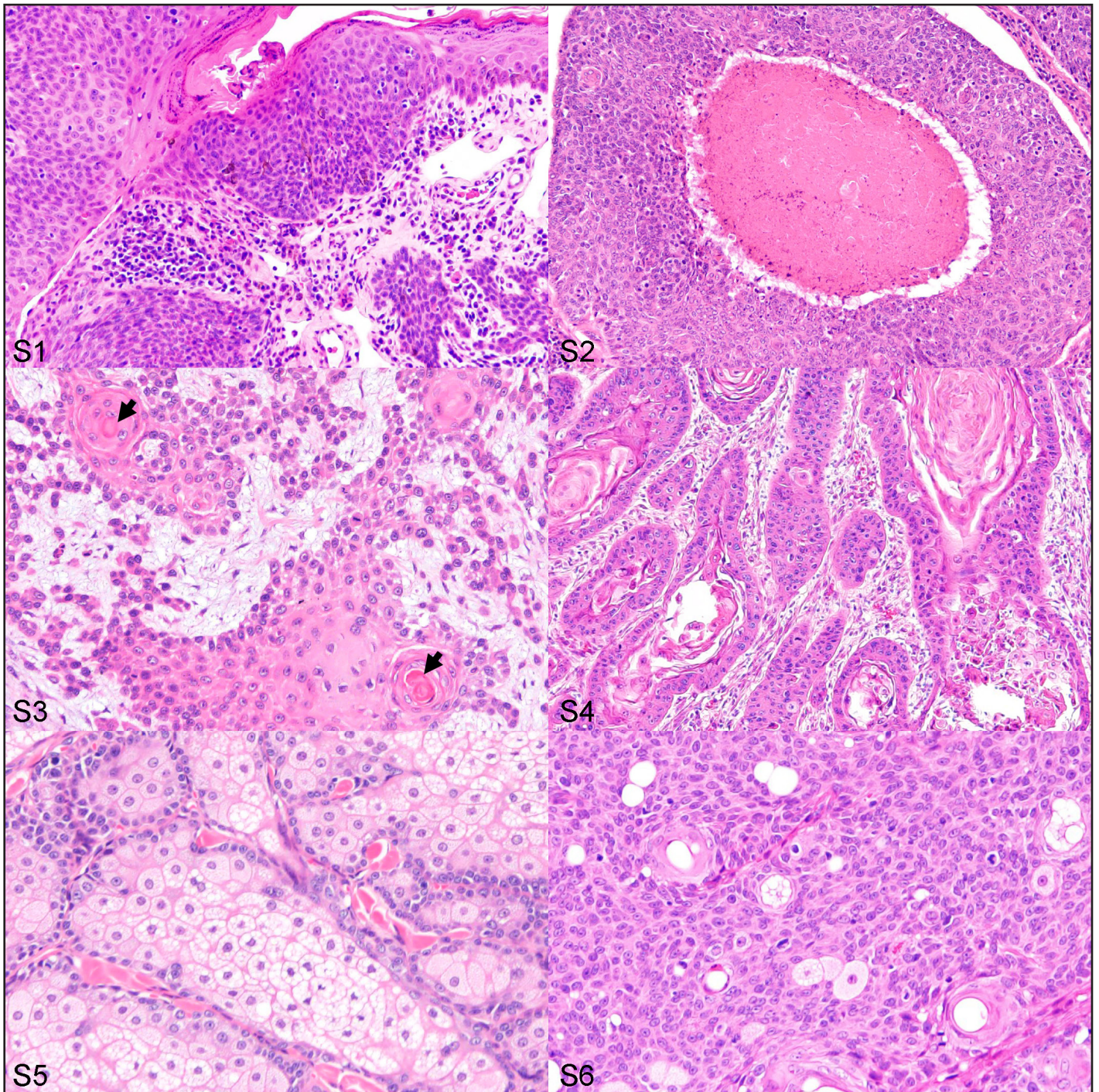


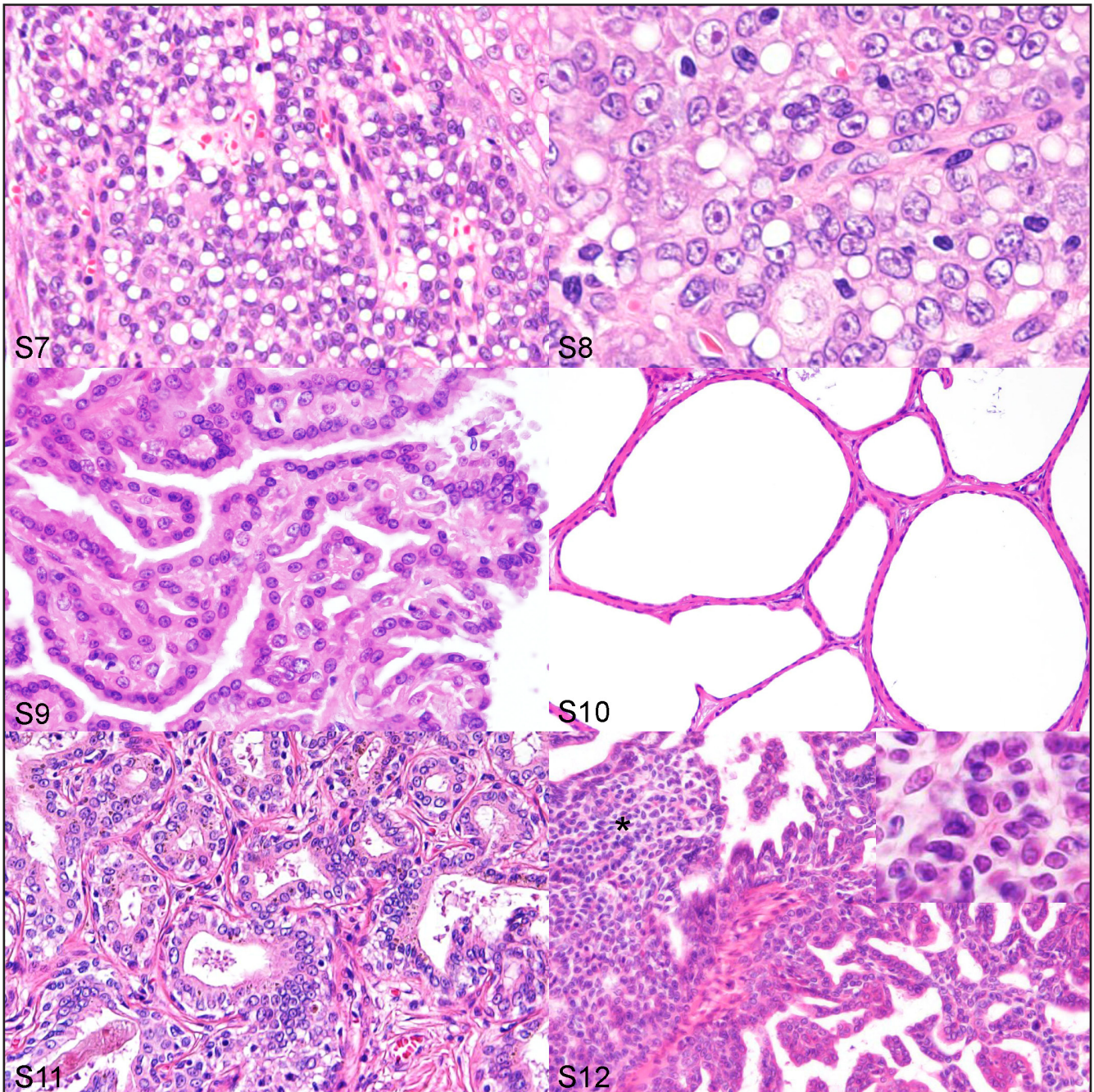
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**Figures S1–S6.** Cutaneous epithelial tumors, dog. Hematoxylin and eosin. **Figure S1.** Basal cell carcinoma. The neoplastic basaloid cells extended from the basal layer of the epidermis into the dermis. **Figure S2.** Basal cell carcinoma. Tumor cells proliferate in lobules with central necrosis. **Figure S3.** Squamous cell carcinoma. Tumor cells proliferate in nests with keratin pearl formation (arrows). **Figure S4.** Acantholytic squamous cell carcinoma. Tumor cells proliferate in cords and form pseudoglandular structures with acantholysis at the center. **Figure S5.** Sebaceous adenoma. Well-differentiated large, clear cells proliferate in lobules with peripheral basaloid reserve cells. **Figure S6.** Sebaceous epithelioma. Basal cells proliferate in sheets with an occasional differentiation into mature clear cells.



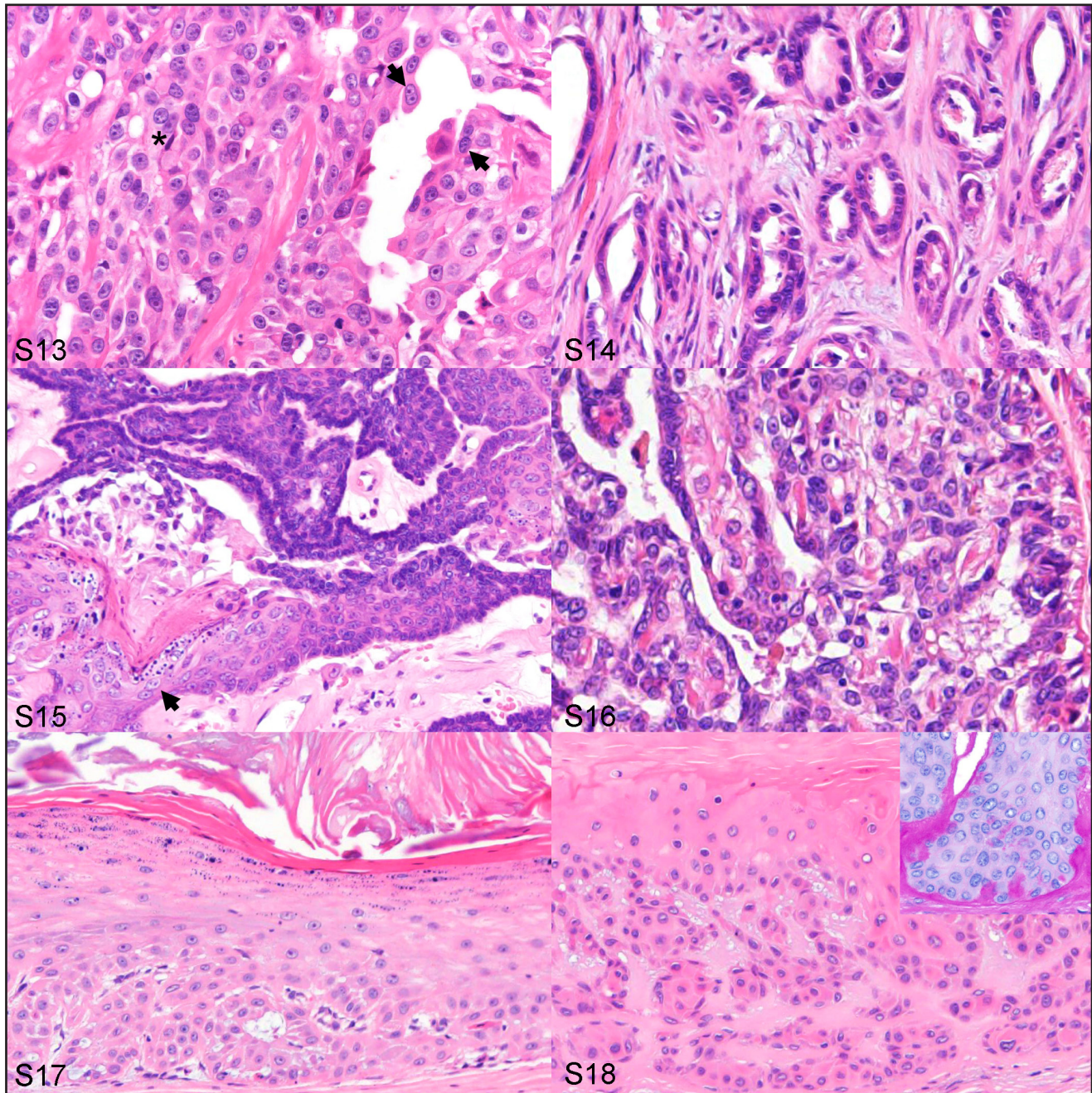
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**Figure S7–S12.** Cutaneous epithelial tumors, dog. Hematoxylin and eosin. **Figure S7.** Sebaceous carcinoma. Tumor cells exhibit intermediate stage of sebaceous differentiation and have small intracytoplasmic vacuoles. **Figure S8.** Sebaceous carcinoma. Higher magnification showing tumor cells with variable sized intracytoplasmic vacuoles and a high degree of anisokaryosis with prominent nucleoli. **Figure S9.** Apocrine adenoma. Cuboidal- to columnar-shaped tumor cells proliferated in a single layered papillary structure. **Figure S10.** Apocrine adenoma. Cystic dilatation of neoplastic glands which is lined by single layer of flattened epithelial cells. **Figure S11.** Complex apocrine adenoma. Secretory cells proliferate in glandular structure and are surrounded by spindle-shaped myoepithelial cells. **Figure S12.** Complex apocrine carcinoma. The pleomorphic epithelial cells are arranged in irregular glandular structures accompanied by the focal proliferation of polygonal-shaped myoepithelial cells that exhibit clear cytoplasm (asterisk; inset).

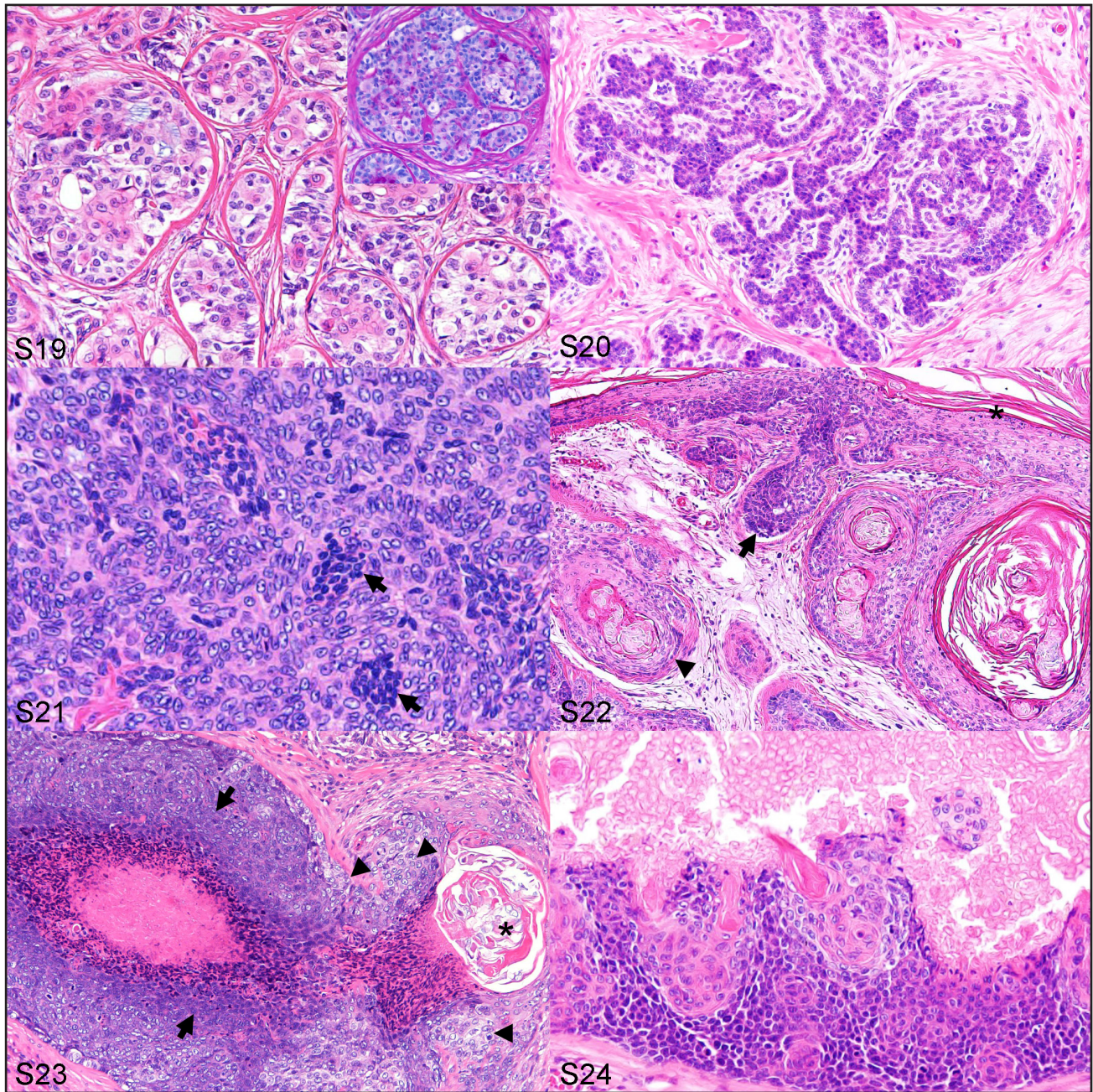


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**Figure S13–S18.** Cutaneous epithelial tumors, dog. Hematoxylin and eosin. **Figure S13.** Apocrine carcinoma and malignant myoepithelioma. Both luminal (arrows) and myoepithelial (asterisk) components exhibit prominent cellular atypia. **Figure S14.** Apocrine carcinoma. Atypical epithelial cells proliferate in single-layered, irregular glandular structures embedded in a mucinous, fibrous stroma. **Figure S15.** Apocrine ductal adenoma. Basaloid cells proliferate in bilayered arrangement resembling the ductal differentiation with occasional squamous metaplasia (arrow). **Figure S16.** Apocrine ductal carcinoma. Neoplastic ductal structures lined by multilayered basaloid cells with prominent nuclear and cellular pleomorphism. **Figure S17.** Infundibular keratinizing acanthoma. Proliferation of basal cells which differentiate into the squamous epithelium, forming a keratin-filled cyst. **Figure S18.** Isthmic tricholemmoma. Basal cells rest on a thick PAS-positive basement membrane (inset) and show abrupt keratinization.





**Figure S19–S24.** Hair follicle tumors, dog. Hematoxylin and eosin. **Figure S19.** Inferior tricholemmoma. Basal cells have clear cytoplasm and are arranged in lobules which are surrounded by the PAS-positive basement membrane (inset). **Figure S20.** Trichoblastoma. Basaloid tumor cells proliferate in a medusoid pattern and are surrounded by dense collagenous stroma. **Figure S21.** Trichoblastoma. Basaloid tumor cells proliferate in a solid pattern and are surrounded by papillary mesenchymal bodies (arrows). **Figure S22.** Trichoepithelioma. The tumor lesion shows differentiations into the hair bulb (arrow), isthmus (arrowhead) and infundibulum (asterisk) of the hair follicle. **Figure S23.** Malignant trichoepithelioma. Basaloid cells with scant eosinophilic cytoplasm (matrical-like cells) (arrows) proliferate in lobule with central necrosis and gradually differentiate into nest of clear cells (arrowheads) with abrupt keratinization (asterisk). **Figure S24.** Pilomatricoma. Matrical cells proliferate and form a cystic structure which consists of ghost cells and keratin materials.



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## Kok et al. Hierarchical Cluster Analysis of Cytokeratins and Stem Cell Expression Profiles of Canine Cutaneous Epithelial Tumors.

**Supplemental Table S1.** Histopathological Features of Cutaneous Epithelial Tumors.

Tumor	Histological Features	Stromal Changes (n/Total)	LV Invasion (n/Total)
<b>Epidermal tumor</b>			
Basal cell carcinoma (n = 2)	Basaloid cells extended from the basal layer of the epidermis and proliferated in lobules with central necrosis which infiltrated the deeper dermis	ND	ND
Squamous cell carcinoma (n = 3)	Infiltrative squamous epithelial cells proliferated in cords or nests with occasional keratin pearl formation	DS (1/3)	ND
Acantholytic squamous cell carcinoma (n = 4)	Acantholysis of tumor cells in the center of tumor cord, forming a pseudoglandular structure	4/4	1/4
<b>Sebaceous tumor</b>			
Sebaceous adenoma (n = 10)	Well-differentiated clear cells proliferate in lobules with peripheral basaloid reserve cells	ND	ND
Sebaceous epithelioma (n = 11)	Basal cells proliferated in sheets with occasional differentiation into clear cells	ND	ND
Sebaceous carcinoma (n = 4)	Infiltrative growth of pleomorphic basaloid cells with intracytoplasmic vacuolation	ND	ND
<b>Apocrine tumor</b>			
Apocrine adenoma (n = 6)	Flattened to columnar-shaped epithelial cells arranged in a single layered branching papillary or tubular structure, and cystic dilatation of the tubules were occasionally observed	ND	ND
Complex apocrine adenoma (n = 7)	Cuboidal- to columnar-shaped epithelial cells proliferated in glandular pattern and were surrounded by myoepithelial cells, which occasionally aggregated in a mucinous matrix	ND	ND
Complex apocrine carcinoma (n = 6)	Pleomorphic epithelial cells were arranged in irregular glandular structures and showed infiltrative growth; benign myoepithelial proliferation was observed in some parts of the tumor lesion	ND	ND
Apocrine carcinoma and malignant myoepithelioma (n = 1)	Both luminal and myoepithelial cells exhibited prominent cellular atypia and infiltrated the surrounding stroma	ND	ND
Apocrine carcinoma (n = 3)	Atypical epithelial cells were arranged in single-layered, irregular glandular structures and infiltrated the subcutaneous tissue	DS (2/3)	LV invasion (1/3)
Apocrine ductal adenoma (n = 1)	Bilayered ductal differentiation with occasional squamous metaplasia	ND	ND
Apocrine ductal carcinoma (n = 2)	Pleomorphic cells arranged in bilayered structure with occasional invasion of inner cells through the basement membrane	ND	ND
<b>Hair follicle tumor</b>			
Infundibular keratinizing acanthoma (n = 11)	Proliferation of basal cells which differentiated into squamous cells and formed keratin-filled cyst	ND	ND
Isthmic tricholemmoma (n = 2)	Basal cells rested on a thick PAS-positive basement membrane and showed upper isthmic differentiation with abrupt (tricholemmomal) keratinization	ND	ND
Inferior tricholemmoma (n = 1)	Basal cells had clear cytoplasm (resembled inferior ORS cells) and arranged in lobules with PAS-positive basement membrane with occasional tricholemmomal keratinization	ND	ND
Trichoblastoma (n = 12)	Basaloid cells proliferated in a mixture of ribbon, medusoid, solid, or granular pattern	MCA (6/12); PMBs (1/12)	ND
Trichoepithelioma (n = 10)	The tumor exhibited differentiation into two or more hair follicle segments	MCA (10/10)	ND
Malignant trichoepithelioma (n = 5)	Tumor cells exhibited infiltrative growth, proliferated in lobules with central necrosis and histomorphologically resembled the hair bulb and suprabulbar region of the hair follicle	DS (2/5); MCA (4/5)	ND
Pilomatricoma (n = 9)	Matrical cells proliferated and formed cystic structure which composed of ghost cells and keratin materials	ND	ND

Abbreviations: DS, desmoplasia; LV, lymph vessels; MCA, mesenchymal cells aggregation; ND, not detected; ORS, outer root sheath; PAS, periodic acid–Schiff.