

1. A biopsy from the tongue shows pseudoepitheliomatous hyperplasia with histiocyte like cells underneath, which contain a granular cytoplasm. A diagnosis is suspected and confirmed with S-100 positivity. Which of the following is true with regards to this tumor:

Answer: D. This question describes a granular cell tumor. They are neural crest in origin and contain numerous lysosomes on EM. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 724-725) *Test taking strategy.* S-100 positivity might suggest melanoma, but remember it is sensitive but not specific for it. No other features are present for melanoma, and a location of the tongue would be odd. The key to this question is the classic description of pseudoepitheliomatous hyperplasia (think granular cell tumor). The diagnosis is cinched with the S-100 stain.

2. EM of an undifferentiated tumor is noted to have long thin microvilli (height to width ~ 10:1). Which of the following tumors is this most consistent with:

Answer: C. The length of microvilli is the single best feature to differentiate pulmonary adenocarcinoma from mesothelioma. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 1340-51)

3. EM of an undifferentiated tumor shows microvilli with long filamentous core rootlets (electron dense). This finding suggests which diagnosis:

Answer: A. Colonic adenocarcinoma is characterized by long filamentous core rootlets. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 1148-49)

4. An undifferentiated tumor shows prominent profiles of rough endoplasmic reticulum. Which of the following markers would also be positive in this lesion?

Answer: B. This description is of a plasmacytoma, which is characterized by staining with CD 138. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 435)

5. A specimen being prepared for electron microscopy should be fixed in:

Answer: D. Gluteraldehyde is the correct fixative for EM.

6. EM of a CNS tumor showed intracellular lumens lined by microvilli with specialized junctions between cells and glial features. This is most consistent with which of the following tumors:

Answer: A. This is the classical description of an ependymoma.

7. EM of a CNS tumor shows prominent interdigitating processes without a basal lamina. There are well formed desmosome junctions and prominent cytoplasmic inclusions. These findings are most consistent with:

Answer: C. These findings are most consistent with a meningioma. (Sternberg's Diagnostic Surgical Pathology, 4<sup>th</sup> Edition, p. 462)

8. EM of a tumor shows rhomboid crystalline inclusions. Cytogenetics also showed a t(X;17). These findings are consistent with which of the following neoplasms?

Answer: C. Rhomboid crystalline inclusions are characteristic of alveolar soft part sarcoma. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 1038-39)

The following questions refer to the website with the appropriate images [www.pathmd.com/questions/vol1\\_no9](http://www.pathmd.com/questions/vol1_no9).

9. Based on the findings in the images for Case 1, which of the following is the best diagnosis?

Answer: E. This EM depicts an adenocarcinoma with short microvilli protruding from the cell surface. Mesothelioma would have longer microvilli. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 1240-1251)

10. Based on the findings in the images for Case 2, which of the following is the best diagnosis?

Answer: A. These EM photos illustrate the “granule in granule” appearance, which characterizes a granular cell tumor. These are also referred to as autophagosomes. Melanoma is a thought, but the dense bodies are not characteristic of a melanosome. Granular cell tumors are of nerve sheath origin (myoblastomas) and express S-100. They are notorious for overlying psuedoepitheliomatous hyperplasia. (Sternberg’s Diagnostic Surgical Pathology, 4<sup>th</sup> Edition, p. 1010-1011 and *Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 724-725)

11. Based on the findings in the images for Case #3, which of the following is the best diagnosis?

Answer: A. These EM photographs show tonofilaments (the black irregular fibril-like densities). Some of these can be seen arising from desmosomes, which anchor cells to cells. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 1182-1185)

12. Based on the findings in the images for Case #4, which of the following is the best diagnosis?

Answer: A. These images are best associated with a meningioma. The “interdigitating” cell membrane combined with the desmosomes are the most characteristic finding. Lymphoma would not have so much cytoplasm or desmosomes. Adenocarcinoma usually will have evidence of microvilli, and squamous cell carcinoma will have tonofilaments. (Sternberg’s Diagnostic Surgical Pathology, 4<sup>th</sup> Edition, p. 462)

13. Based on the findings in the images for Case #5, which of the following is the best diagnosis?

Answer: D. The features in these EM photos best illustrate an oncocytoma with numerous mitochondria in the cytoplasm. A chromophobe RCC will have 150-750nm vesicles in the cytoplasm. (*Ultrastructural Pathology of the Cell and Matrix*. FN Ghadially, Fourth Ed. 1997, p. 266-267)