

No.1403

カニクイザルの卵巣腫瘍

Ovarian mass in a cynomolgus monkey

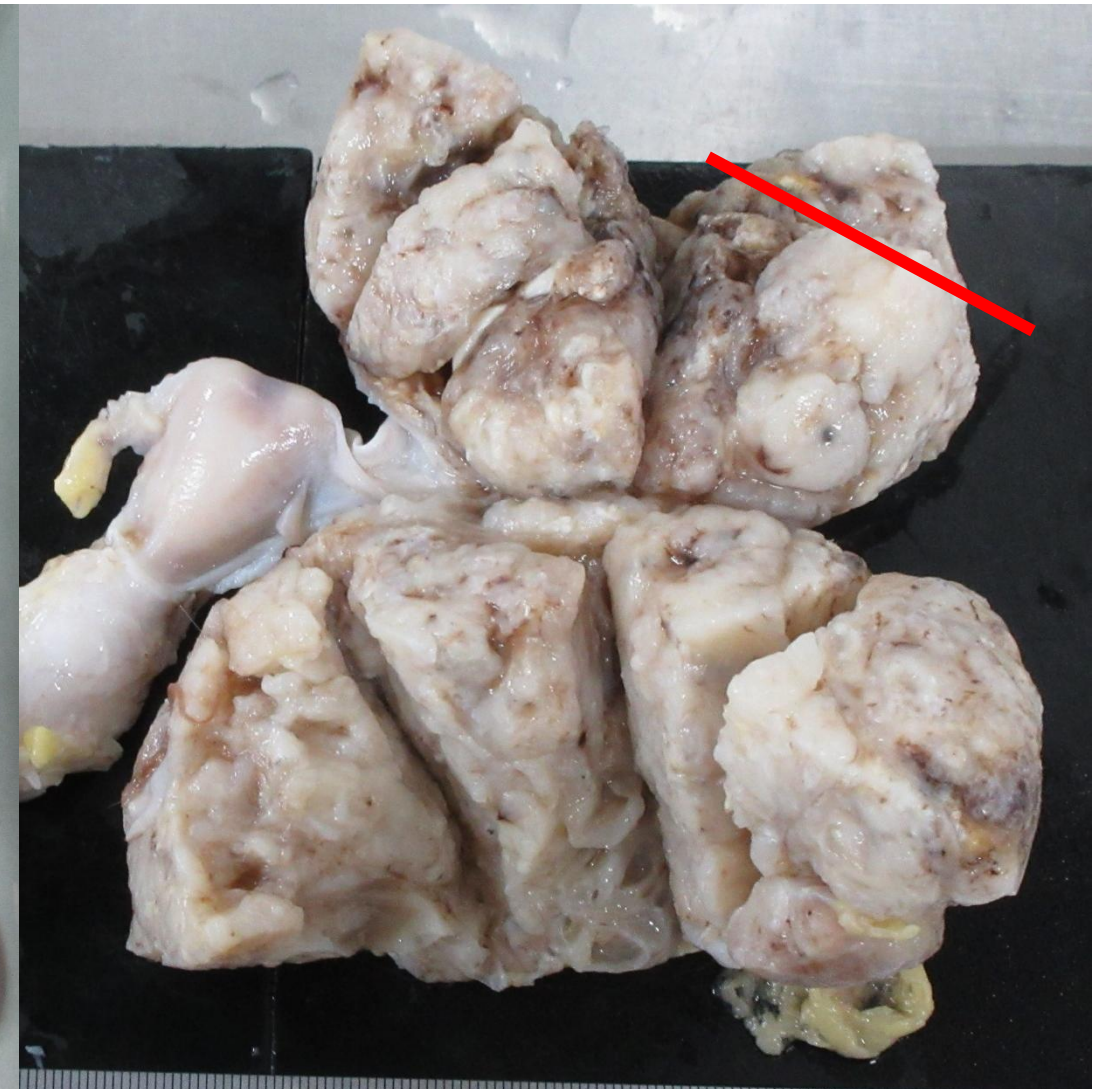
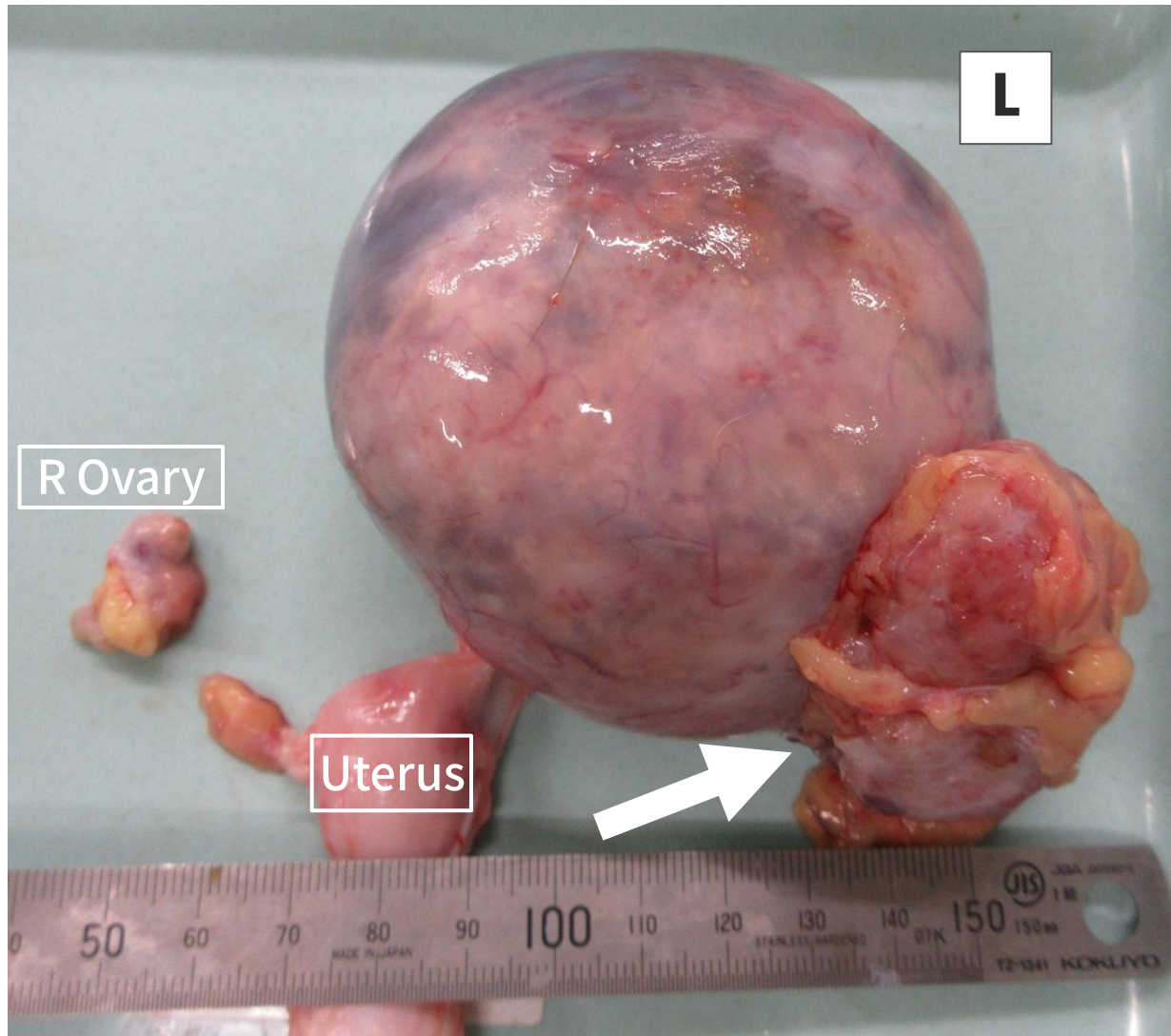


mediford
A Member of PHC Group

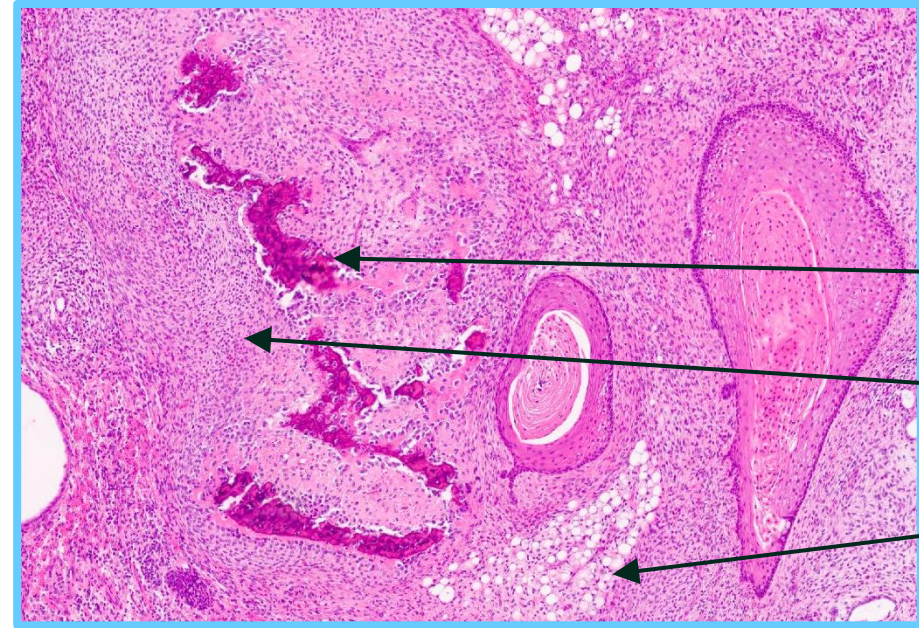
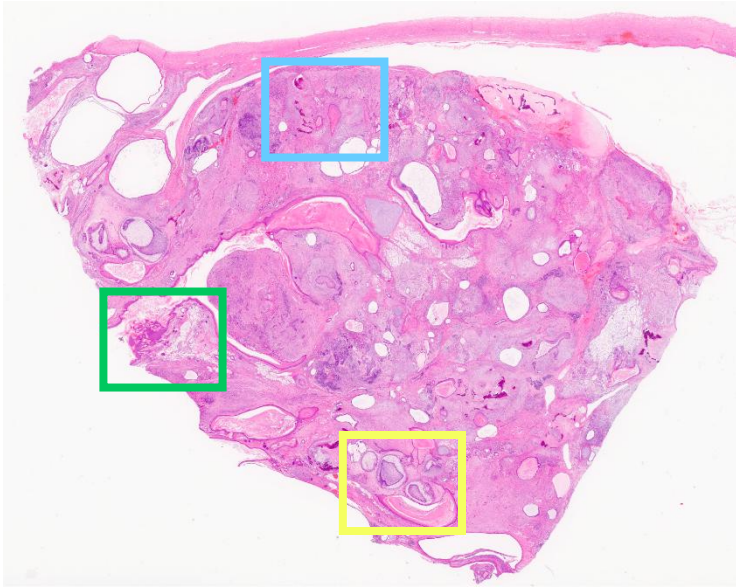
MATSUMOTO Kana

メディフォード株式会社

Gross



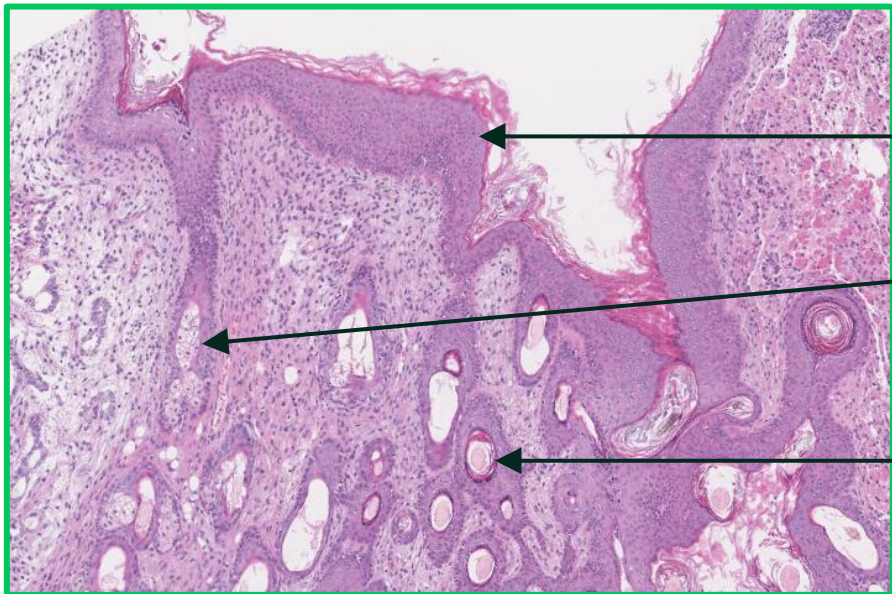
Histopathology – Mature component



Bone

Cartilage

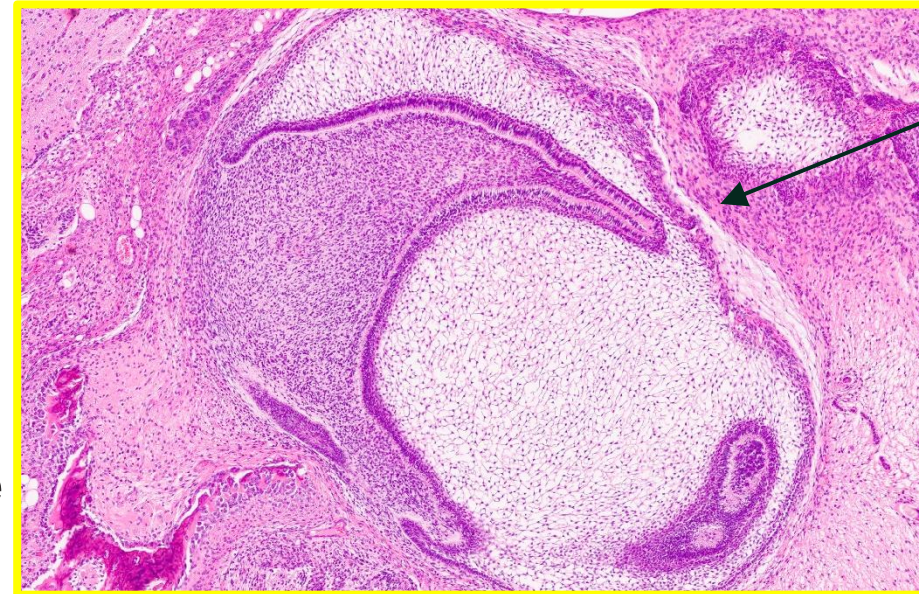
Lipids



Skin

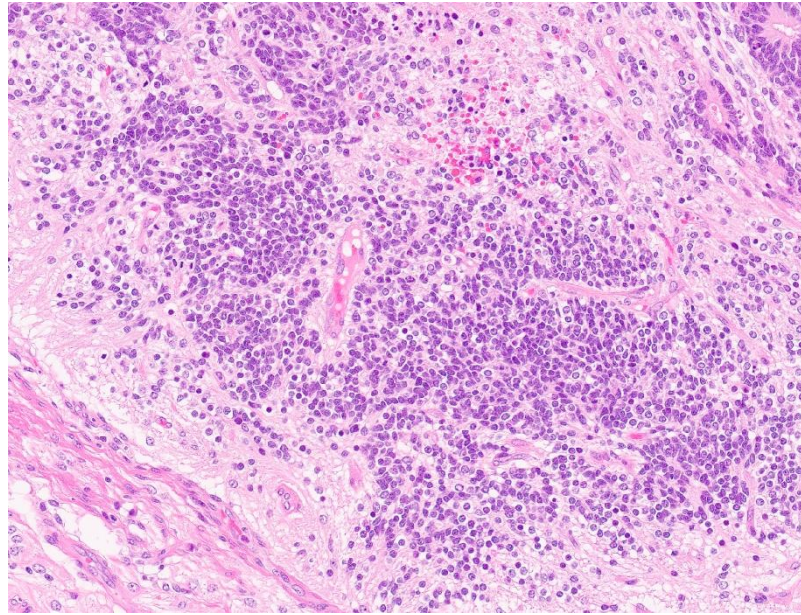
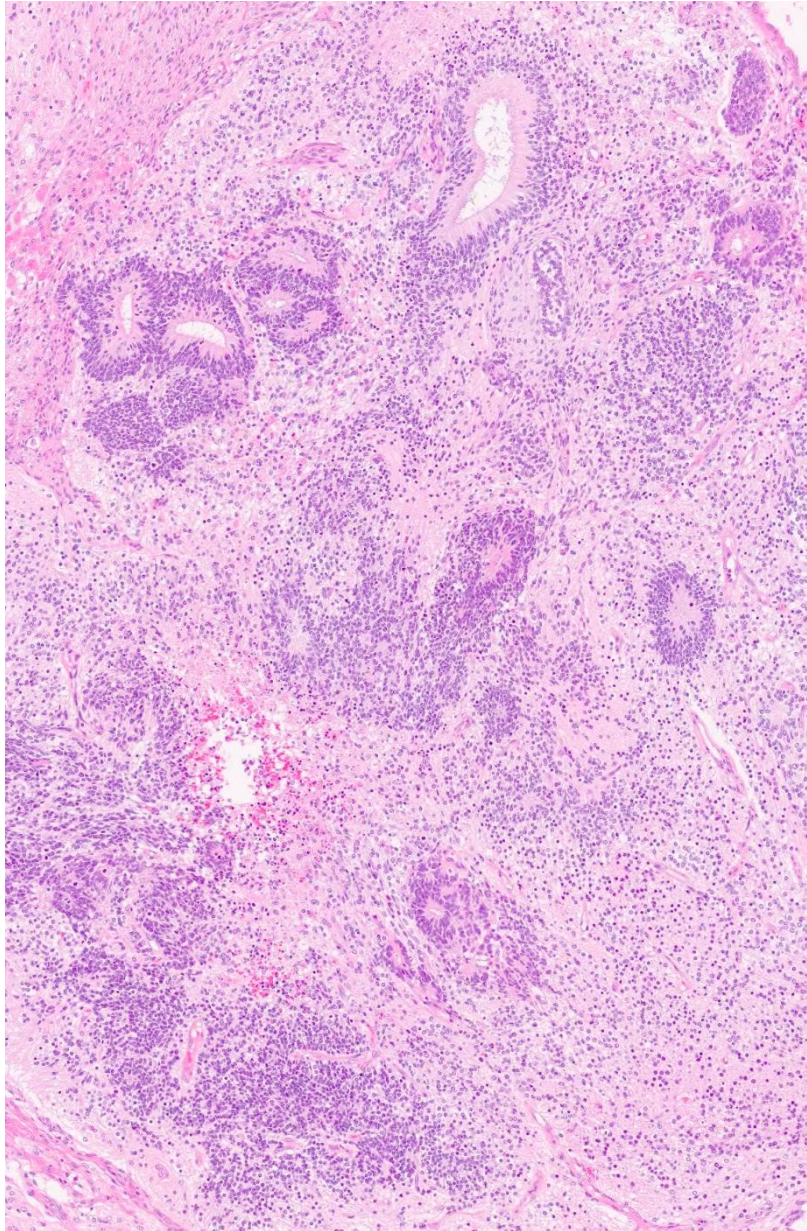
Sebaceous glands

Hair & Hair follicle

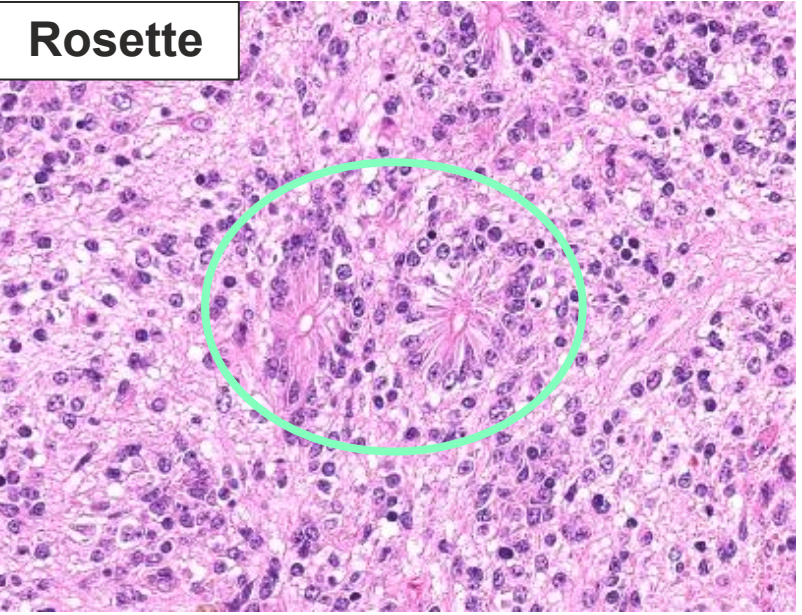
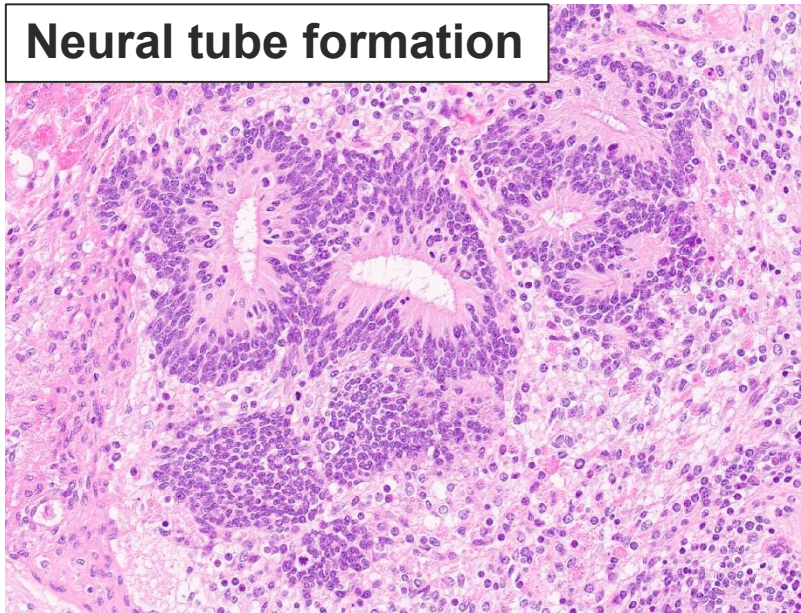


Tooth germ (bell stage)

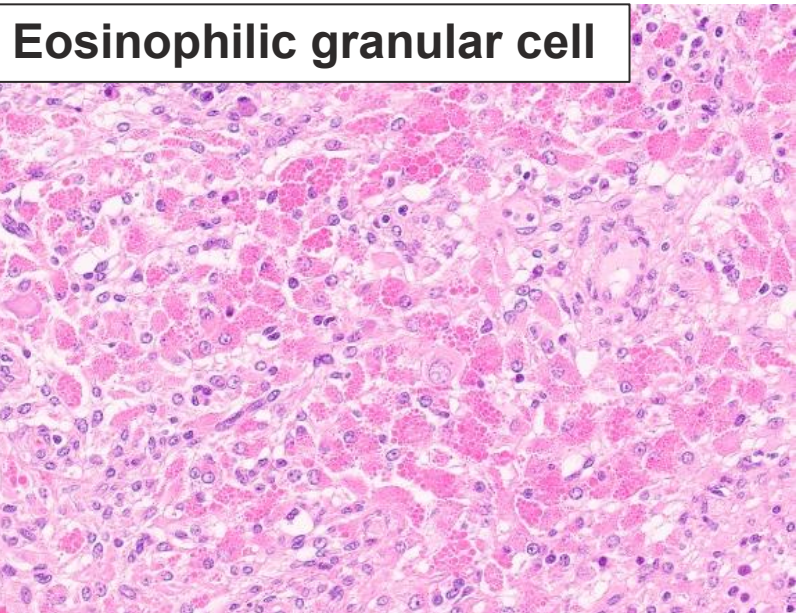
Histopathology – Immature component



Neural tube formation

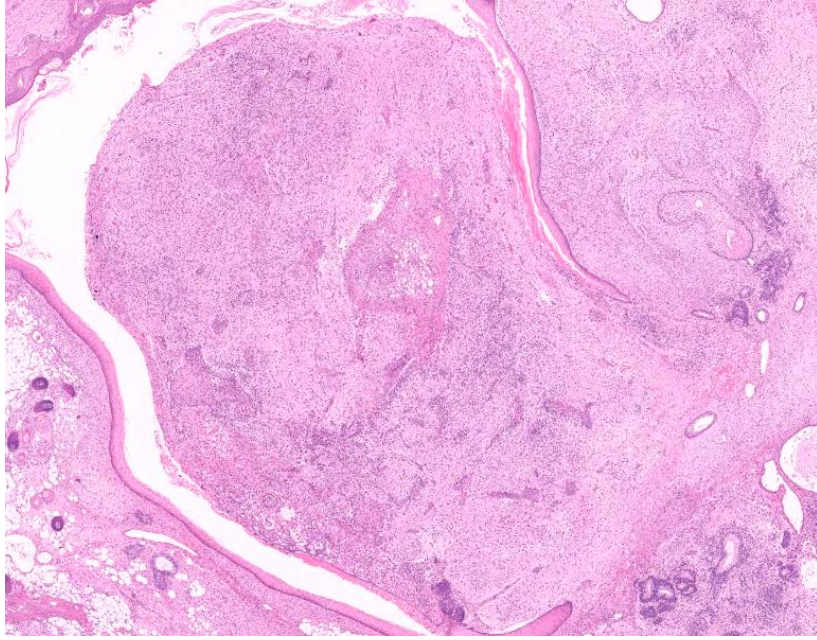


Rosette

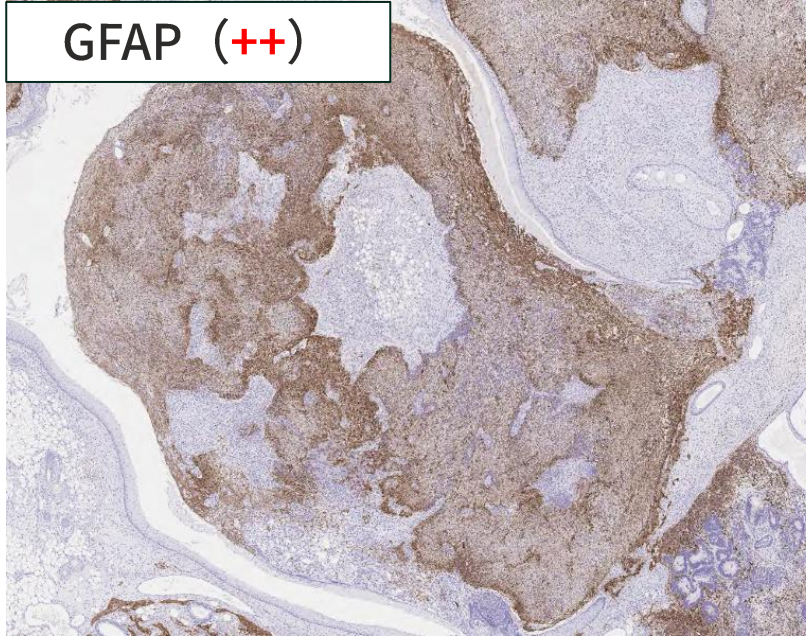


Eosinophilic granular cell

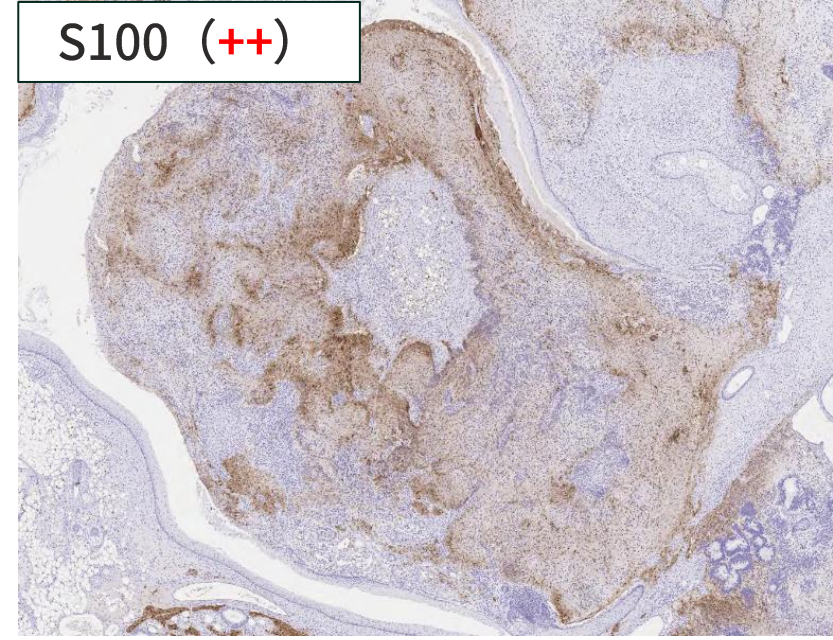
Immunohistochemistry – Neurological markers



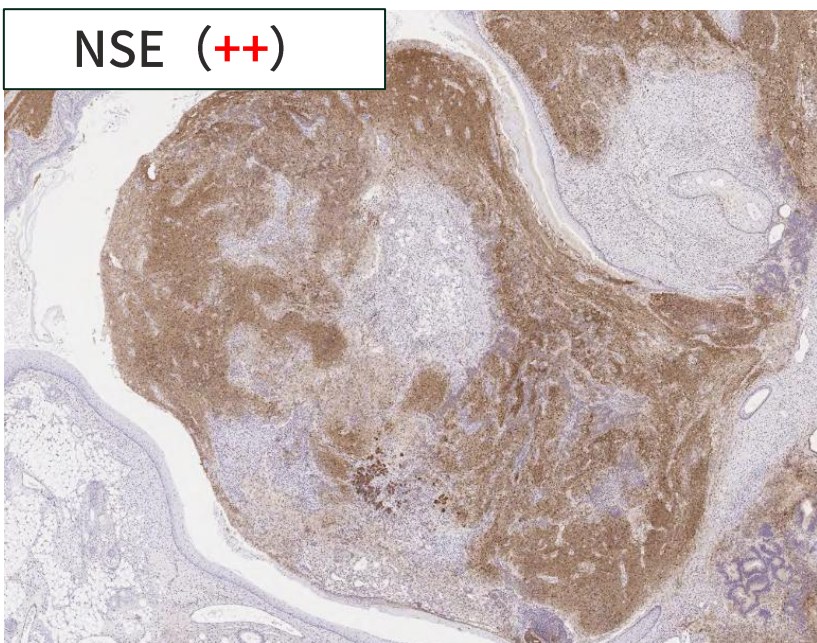
GFAP (++)



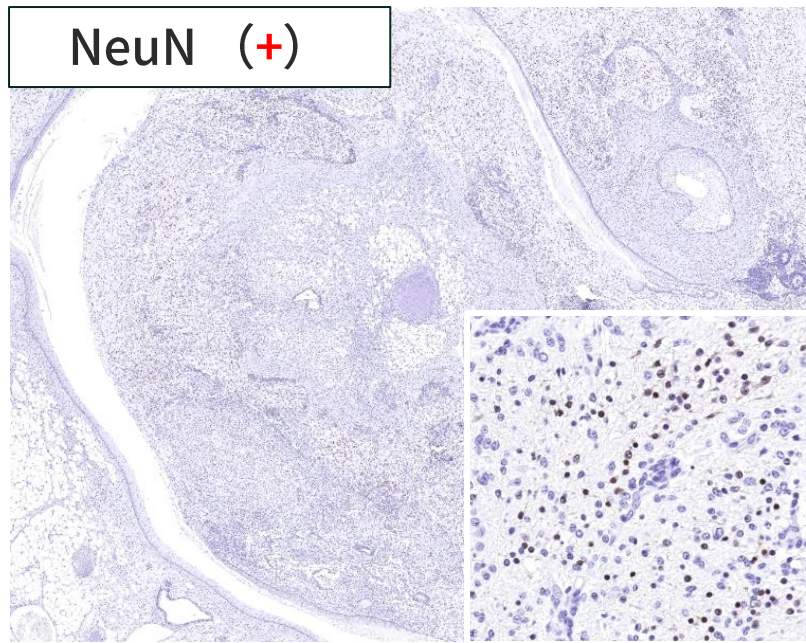
S100 (++)



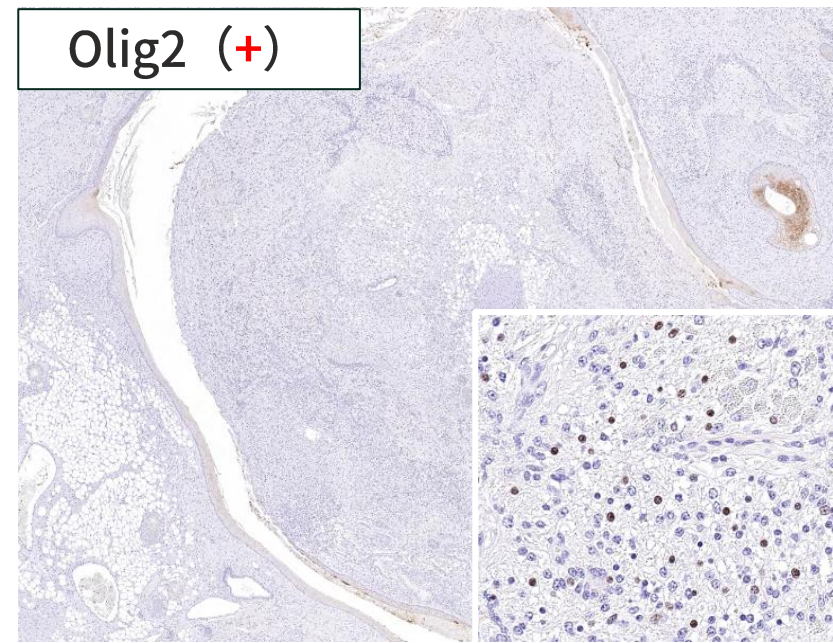
NSE (++)



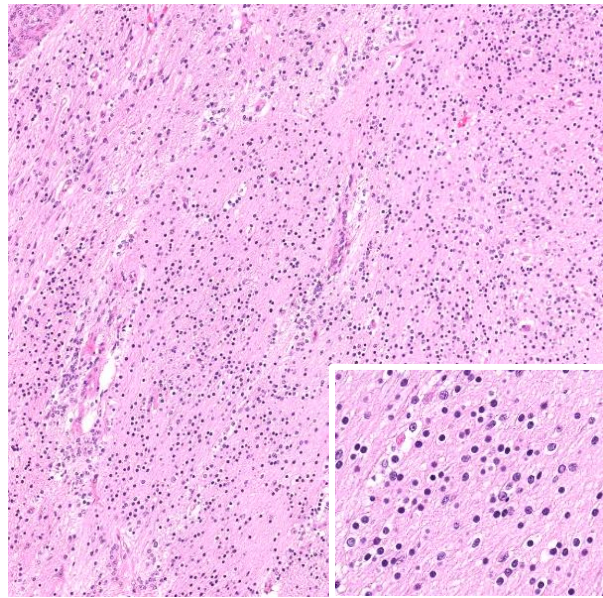
NeuN (+)



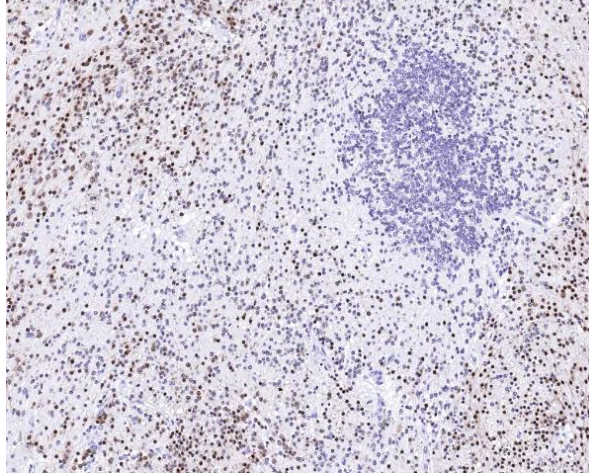
Olig2 (+)



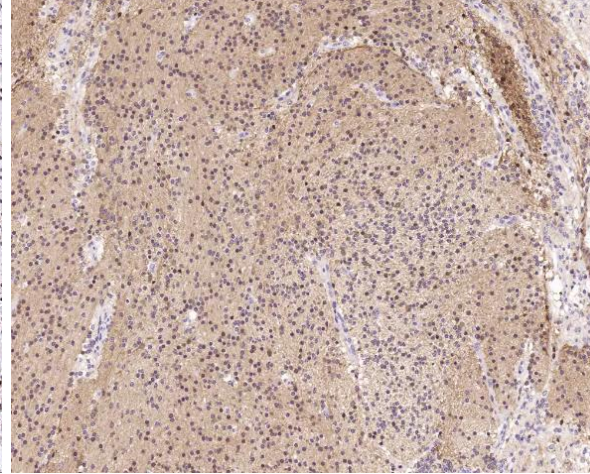
Immunohistochemistry – Mature neuron region



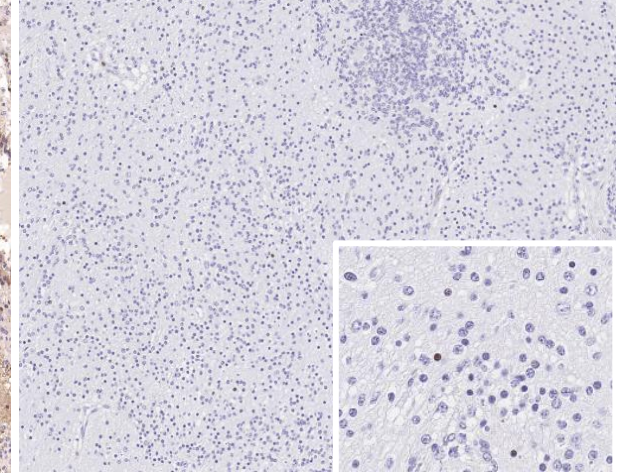
NeuN
(++)



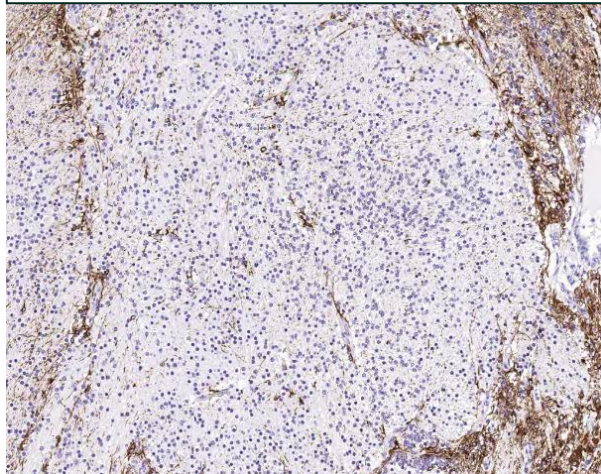
NSE
(++)



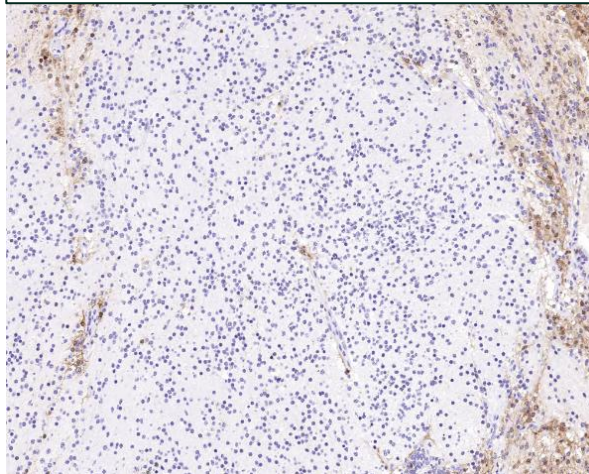
Olig2
(+)



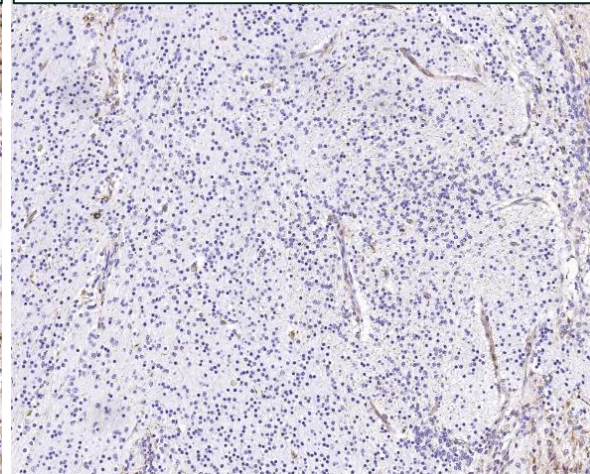
GFAP
(-)



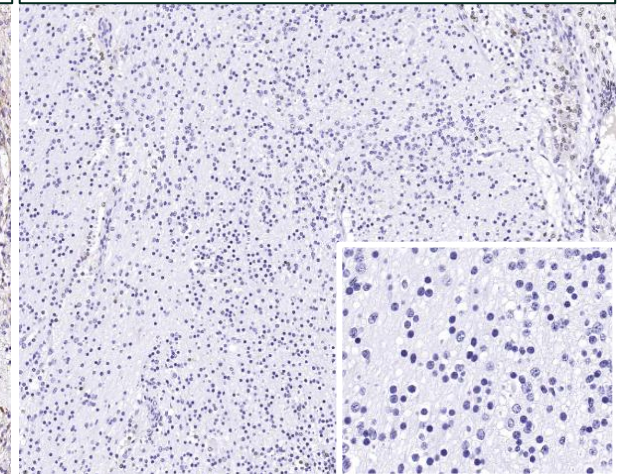
S100
(-)



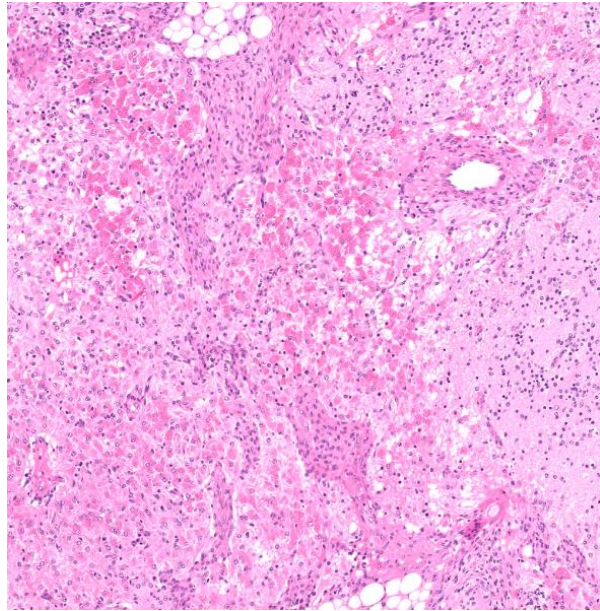
Vimentin
(-)



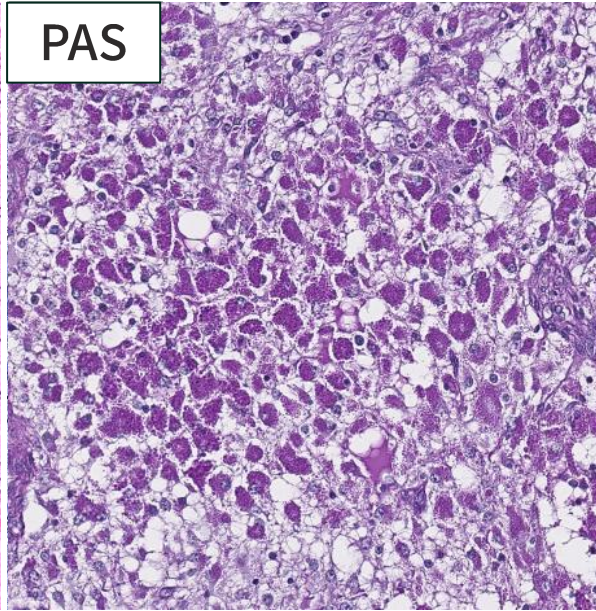
Sox2 : Neuroepithelial
(-)



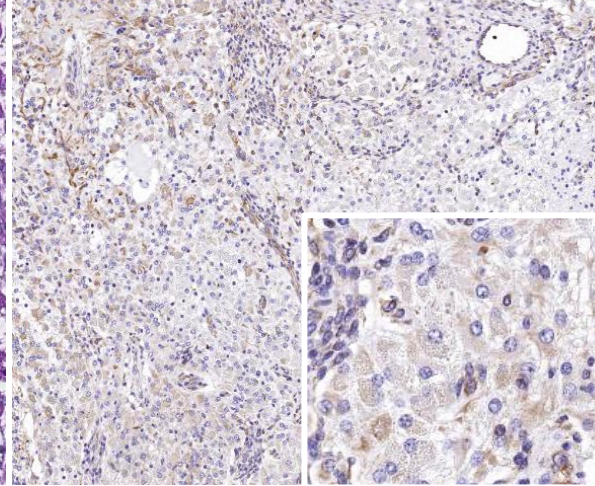
Immunohistochemistry – Eosinophilic granular cell



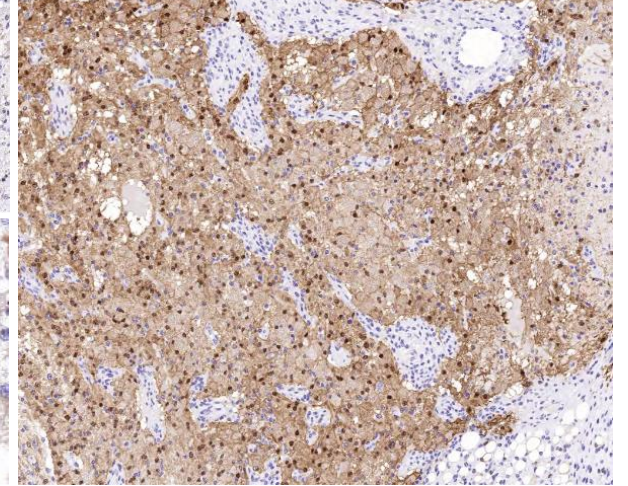
PAS



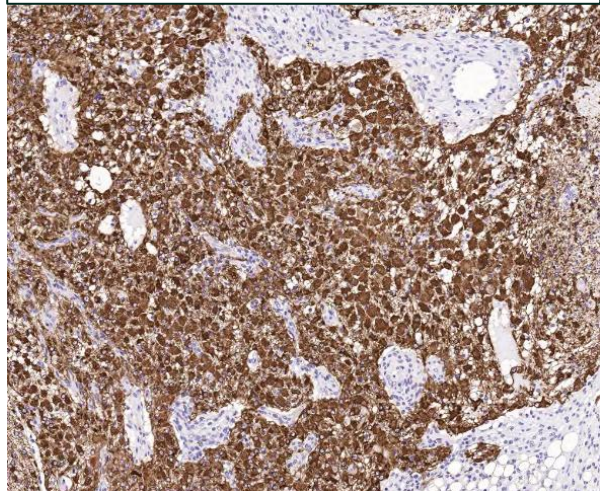
Vimentin : Radial glial
(++)



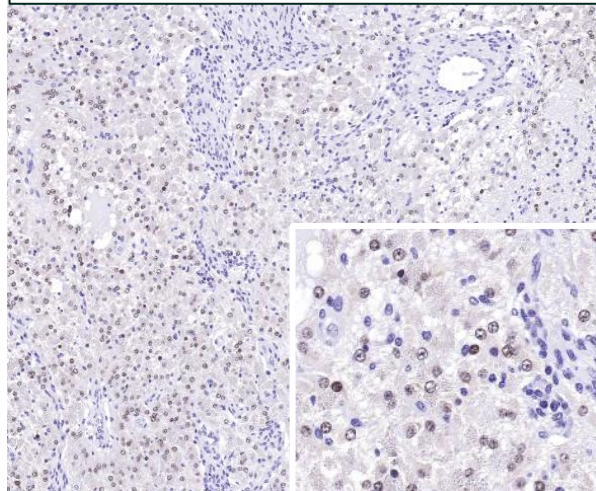
S100
(++)



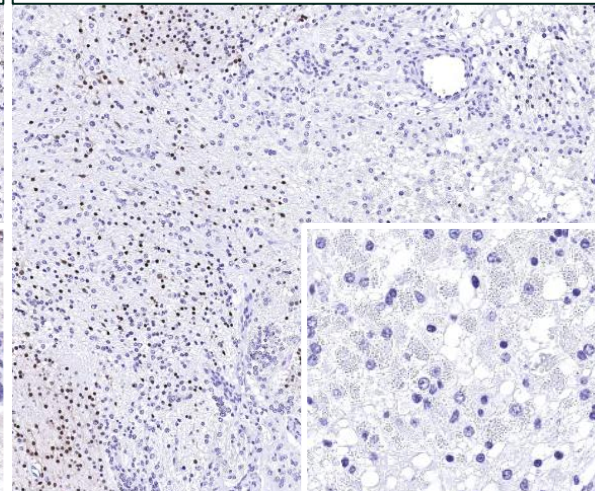
GFAP
(++)



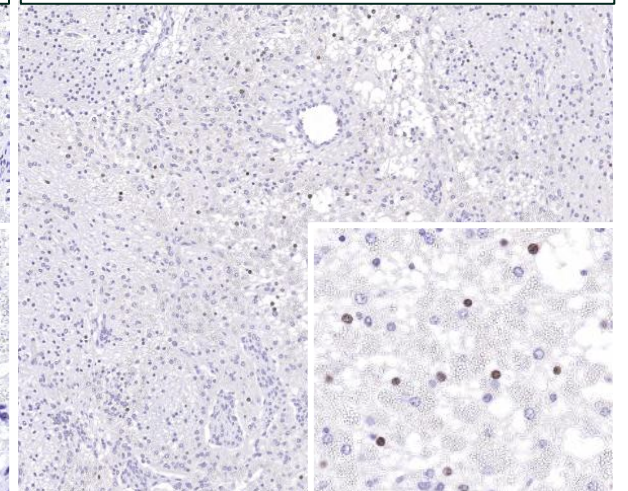
Sox2 : Neuroepithelial
(++)



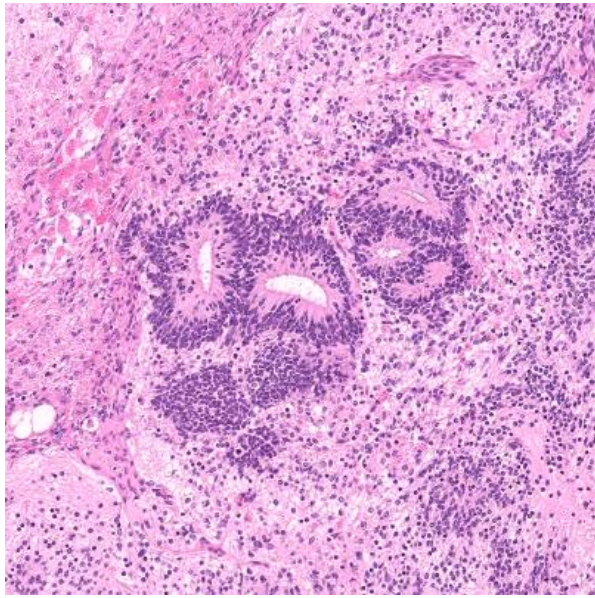
NeuN
(-)



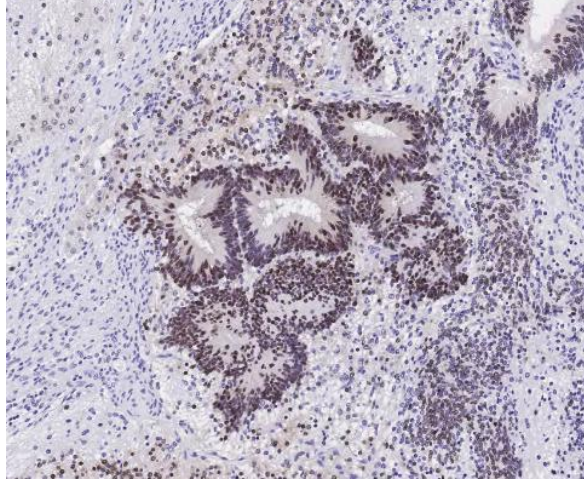
Olig2
(-)



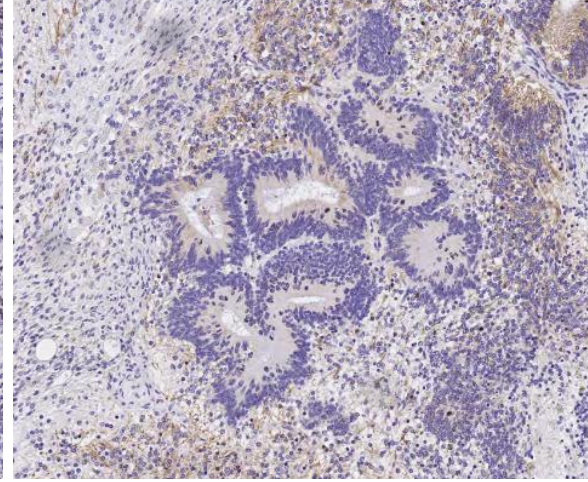
Immunohistochemistry – Neural tube formation



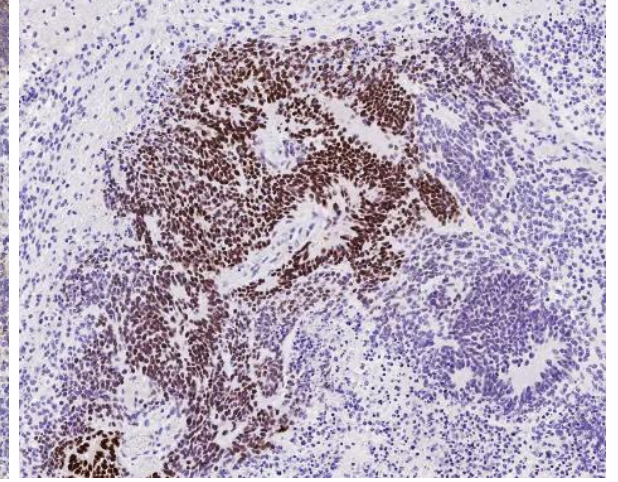
Sox2 : Neuroepithelial
(++)



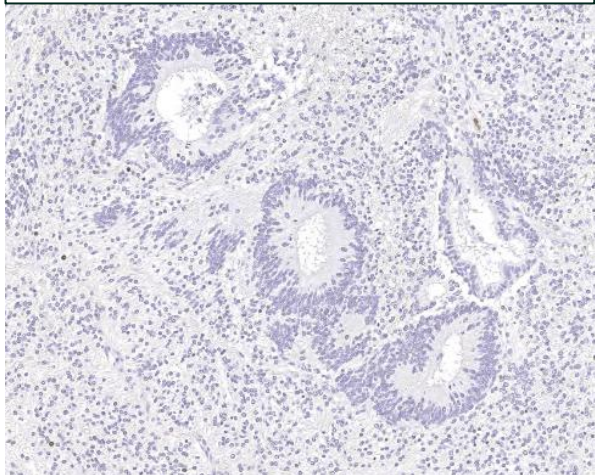
Vimentin : Radial glial
(+)



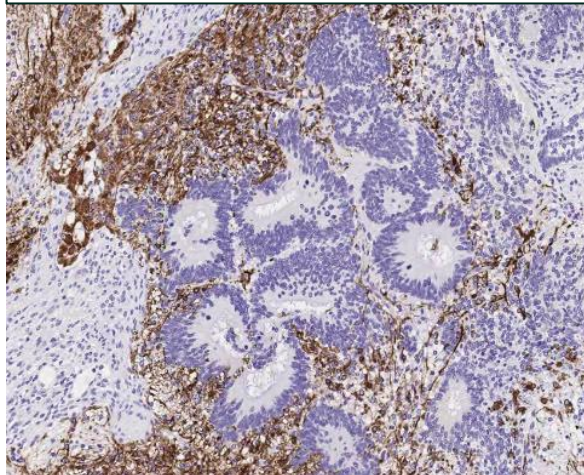
SALL4 :
Embryonic stem cells (+)



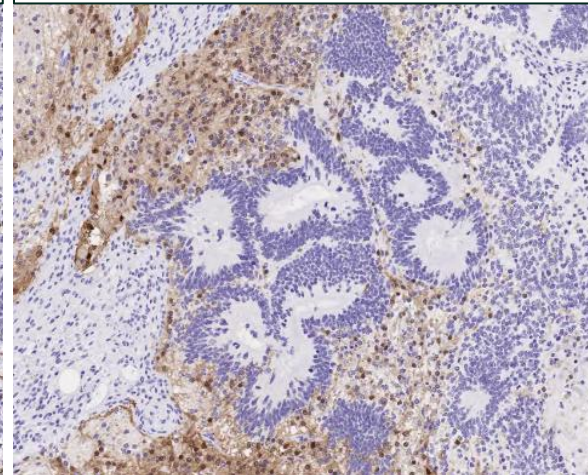
Olig2
(-)



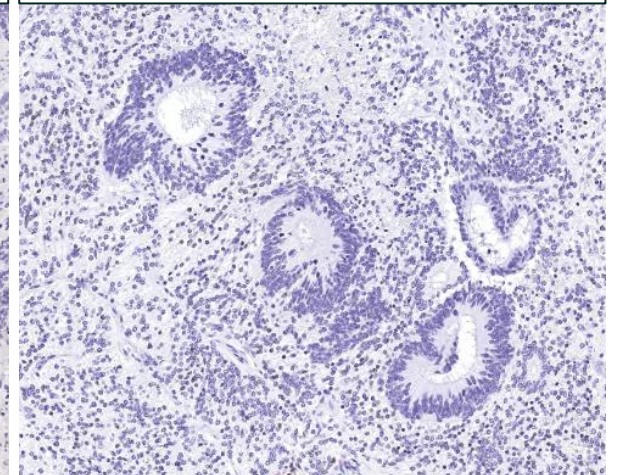
GFAP
(-)



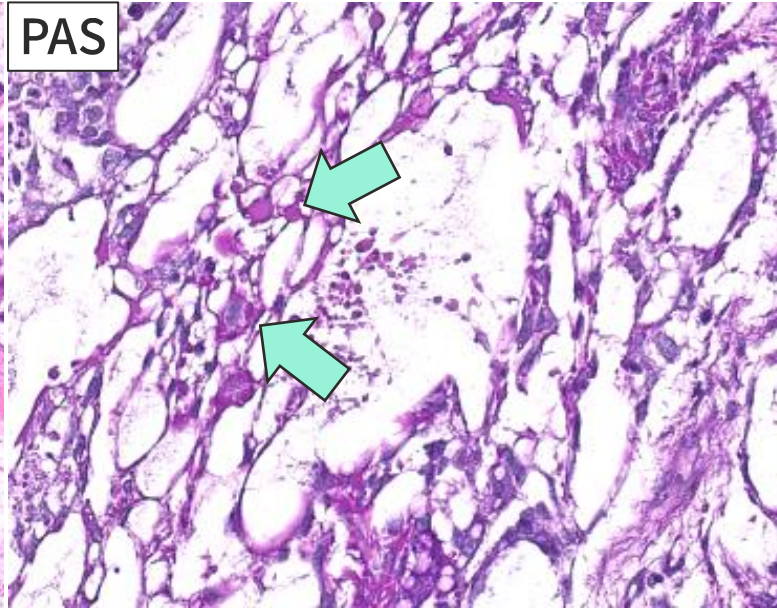
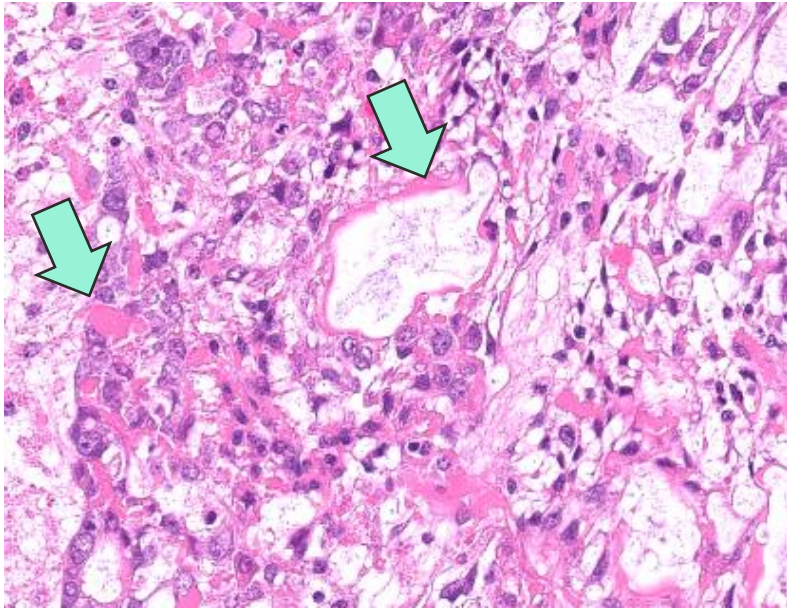
S100
(-)



NeuN
(-)

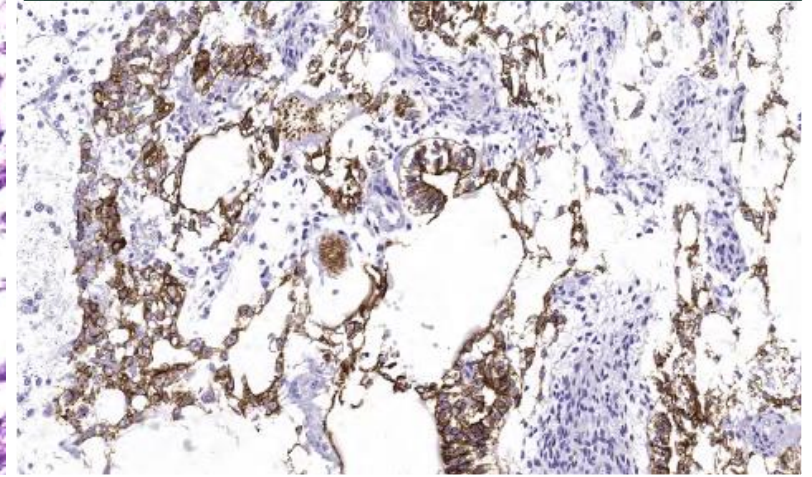


Immunohistochemistry – Yolk sac tumor component



PAS

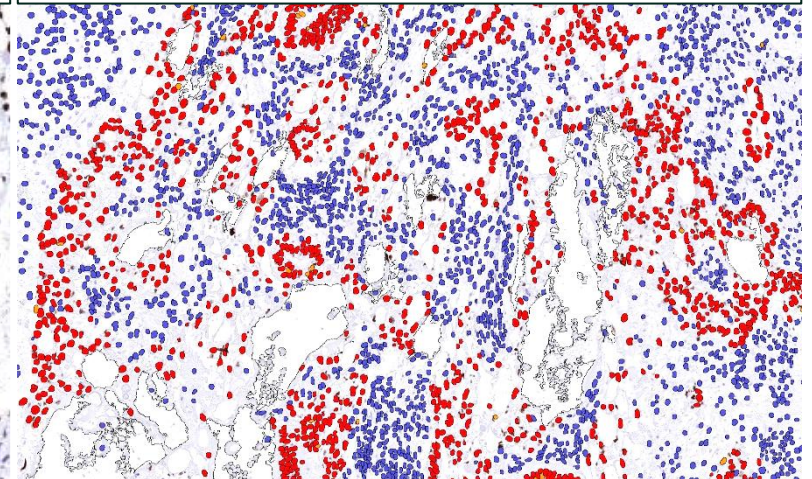
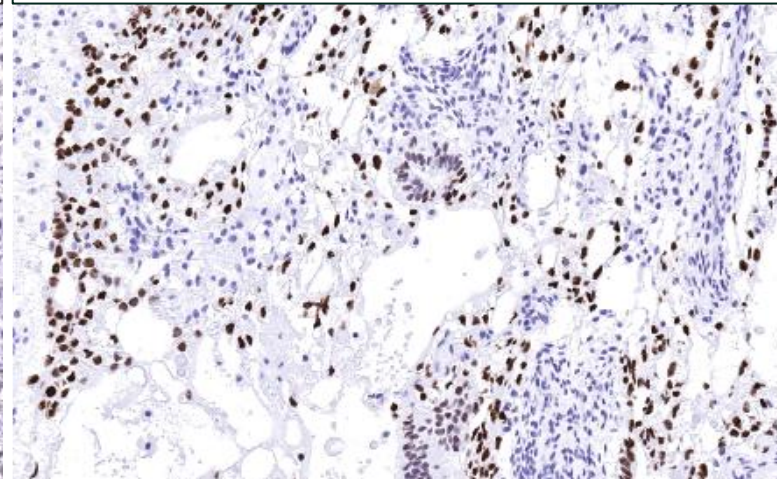
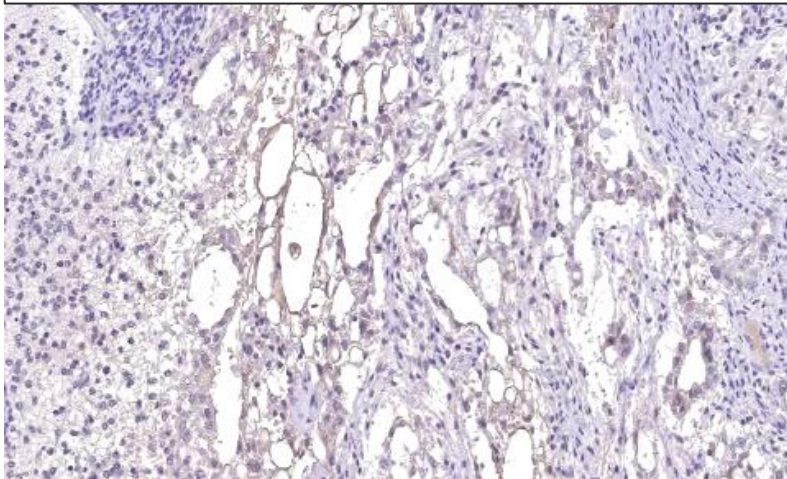
CK (AE1/AE3) : Epithelial cells
(++)



AFP : Yolk sac tumor
(++)

SALL4 : Embryonic stem cells
(Yolk sac tumor) (++)

SALL4 (HALO)
: Red (++)



Immunohistochemistry – Proliferative activity

<Ki67>

Immature neuroectoderma (++)

Yolk sac (++)

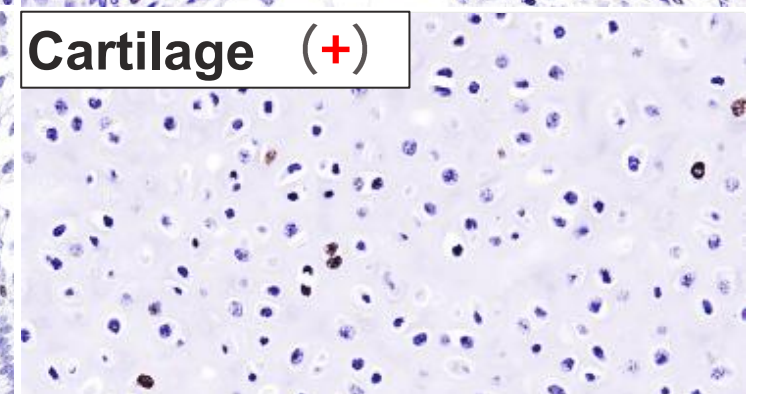
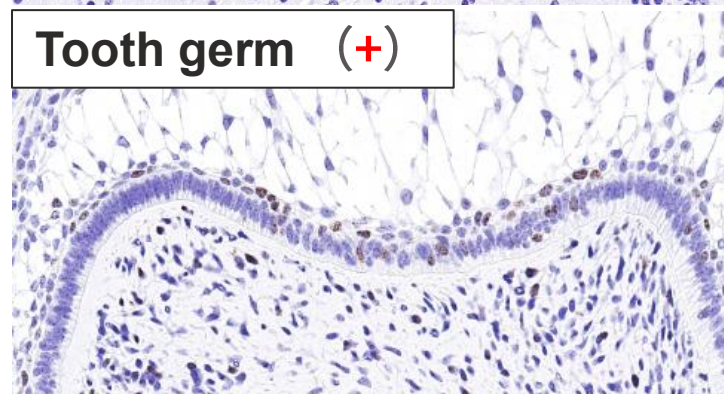
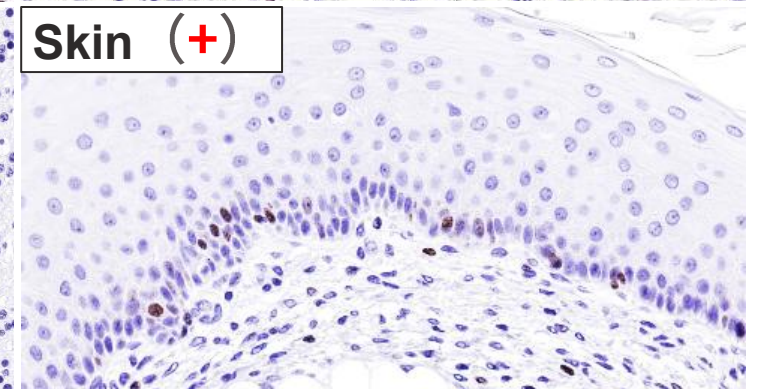
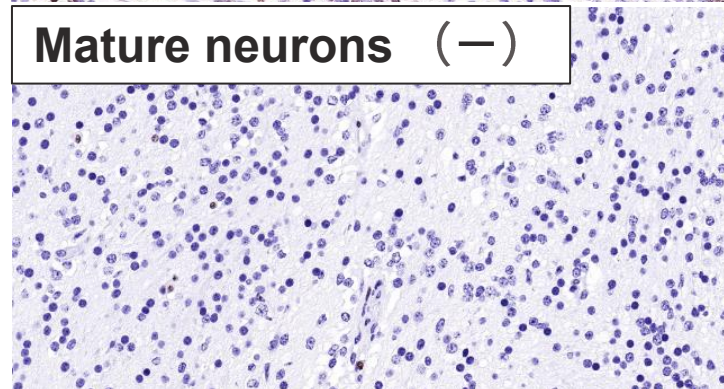
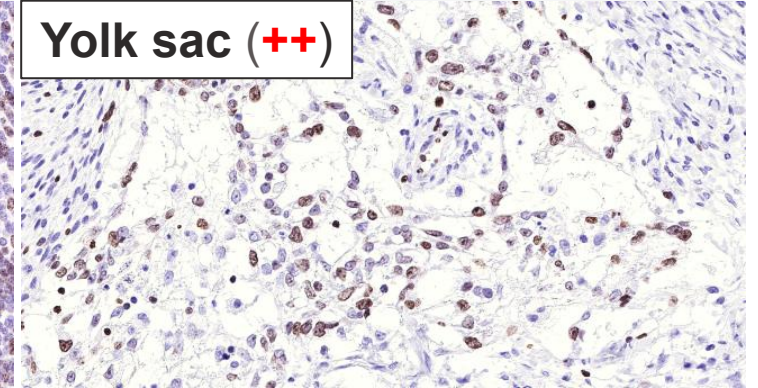
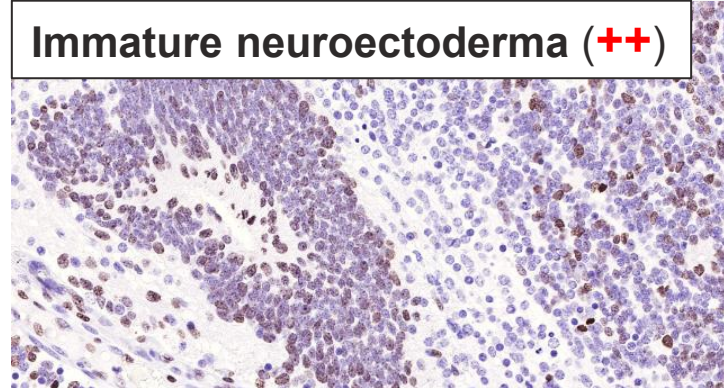
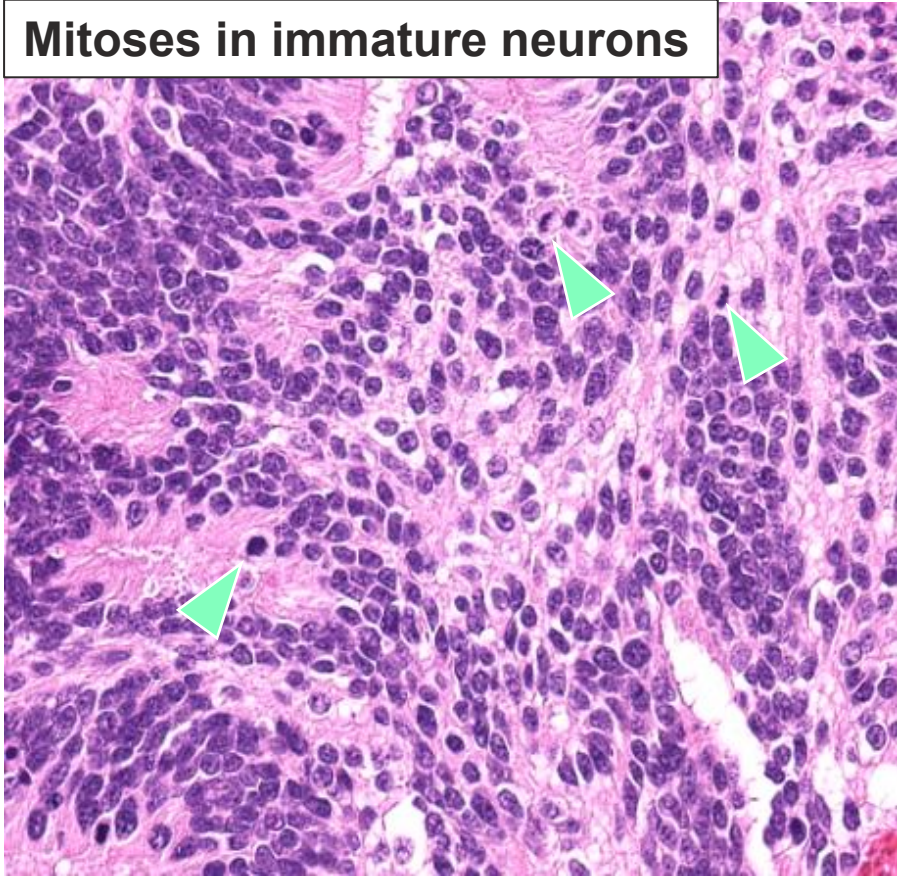
Mature neurons (—)

Skin (+)

Tooth germ (+)

Cartilage (+)

Mitoses in immature neurons

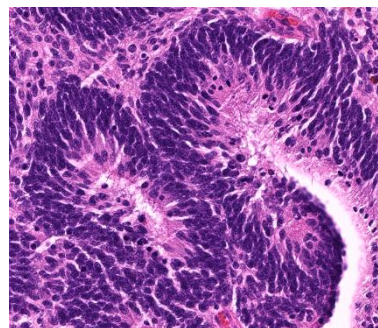
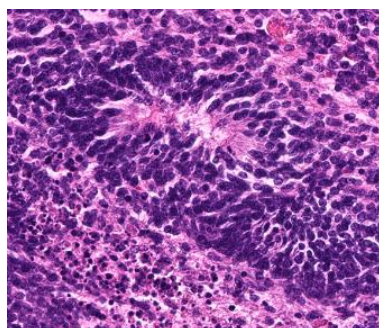
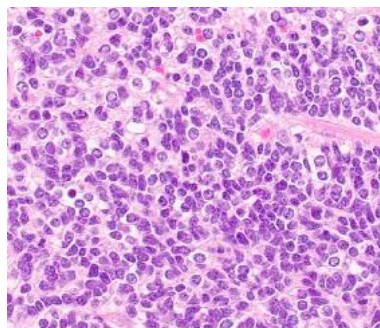


Results

Histologic components

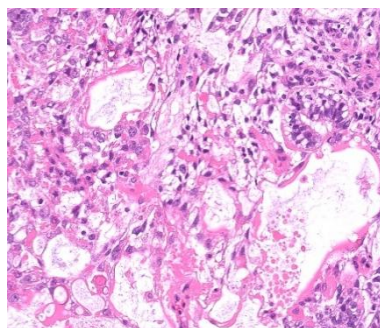
Immature components

- Neuroepithelium
- Rosette, Neural tube formation



→ Neuroectodermal (Ectoderm)

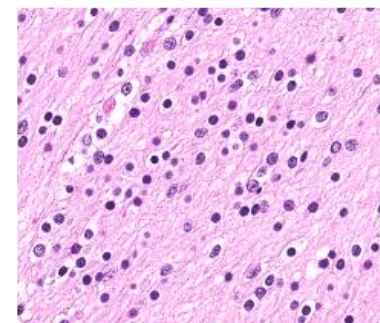
- + Yolk sac tumor component (Endoderm)



Mature components

- Skin
- Sebaceous glands
- Hair & Hair follicle
- Tooth germ(bell stage)
- Mature neurons

} Ectoderm



- Bone, Cartilage
- Lipids
- Collagen fibers

} Mesoderm

Diagnosis: Immature teratoma with yolk sac tumor components

診断：卵黄囊腫瘍成分を含む未熟奇形腫

Discussion – Immature teratoma

Human

× Fetal cartilage, Tooth germ

<Definition>

- Containing variable amounts of **immature tissue** (typically primitive neuroectodermal)
- Constitutes about a 3rd of malignant germ cell tumors

<Histologic description>

- Mixture of mature tissue and immature components
- Immature neuroepithelium
 - • Spindled (sarcomatoid) or with rosette, pseudorosette and primitive tubule formation
 - Primitive with scant cytoplasm, hyperchromatic nuclei and frequent mitoses
 - Only immature neuroepithelium is used for grading

<Grading>

Grade	Immature tissue	Mitoses	immature neuroepithelium	Clinicopathological classification
1 (Low)	Low dose	Infrequent	≤ 1 LPF (40x) in any slide	Borderline malignant tumor
2 (High)	Moderate amount	High frequency	>1 to ≤ 3 LPF in any slide	
3 (High)	Extensive	High frequency	> 4 LPF in any slide	Malignant tumor

LPF - Low power field



Discussion – Diagnosis in animal

<Animal>

- **Malignant Teratoma** (12)

Dog (4), Mouse (2), Cat (1), Rat (1), Otter (1),
Hedgehog (1), Iguana (1), Turtle (1)

- **Teratocarcinoma** (5)

Horse (2), Emu (2), Duck (1)

→ Possessing characteristics of malignant tumors such as **metastasis** and **invasiveness**
+ Some contain immature components

- **Immature teratoma** (8)

Dog (6), Rat (1), Cow (1)

Small yolk sac carcinoma-like component

→ Possessing **Immature tissue**

Tsubota et al. 2004



Total 25 case

<Human>

Germ cell tumours

- **Immature teratoma**

→ Embryonoid (Immature) tissue present
(neuroepithelial rosettes, neural tube-like formation)

- **Mixed germ cell tumor**

→ Composed of 2 or more primitive germ cell components

- **Teratoma with malignant transformation**

→ Secondary carcinoma (somatic malignant tumors) arises from the tumor components of a mature teratoma

Discussion – Diagnosis in animal

<Animal>

- **Malignant Teratoma** (12)
Dog (4), Mouse(2), Cat(1), Rat(1), Otter(1), Hedgehog(1), Iguana(1), Turtle(1)
- **Teratocarcinoma** (5)
Horse(2), Emu(2), Duck(1)
→ Possessing characteristics of malignant tumors such as **metastasis** and **invasiveness**
+ Some contain immature components
- **Immature teratoma** (8)
Dog(6), Rat(1), Cow(1)

Small yolk sac carcinoma-like component

→ Possessing **Immature tissue** Tsubota et al. 2004

<Human>

Germ cell tumours

- **Immature teratoma**
→ embryonoid (Immature) tissue present
(neuroepithelial rosettes, neural tube-like formation)
- **Mixed germ cell tumor**
→ Composed of 2 or more primitive germ cell components
- Immature teratomas containing one or more YST lesions of **<3 mm** are classified as **mixed germ cell tumors**.
→ **>3mm = Immature teratoma**

(WHO Classification of Tumours, 5th ed)

**Immature teratoma
with yolk sac tumor components**

卵黄囊腫瘍成分を含む未熟奇形腫

We gratefully acknowledge the cooperation of the following members of

Nippon Veterinary and Life Science University

Veterinary Nursing and Technology, Physiological Pathology

Masami Yamamoto

Hisashi Yoshimura

Veterinary Science, Veterinary Pathology

Masaki Michishita

Yukino Machida