Supplementary Data Description

file name: **Additional Table 1**
title of data: **Topics of the pathology lectures in the current project.** Details include the organ or anatomic region as wells as the tumor entity that were subject in the lectures where this study was conducted.

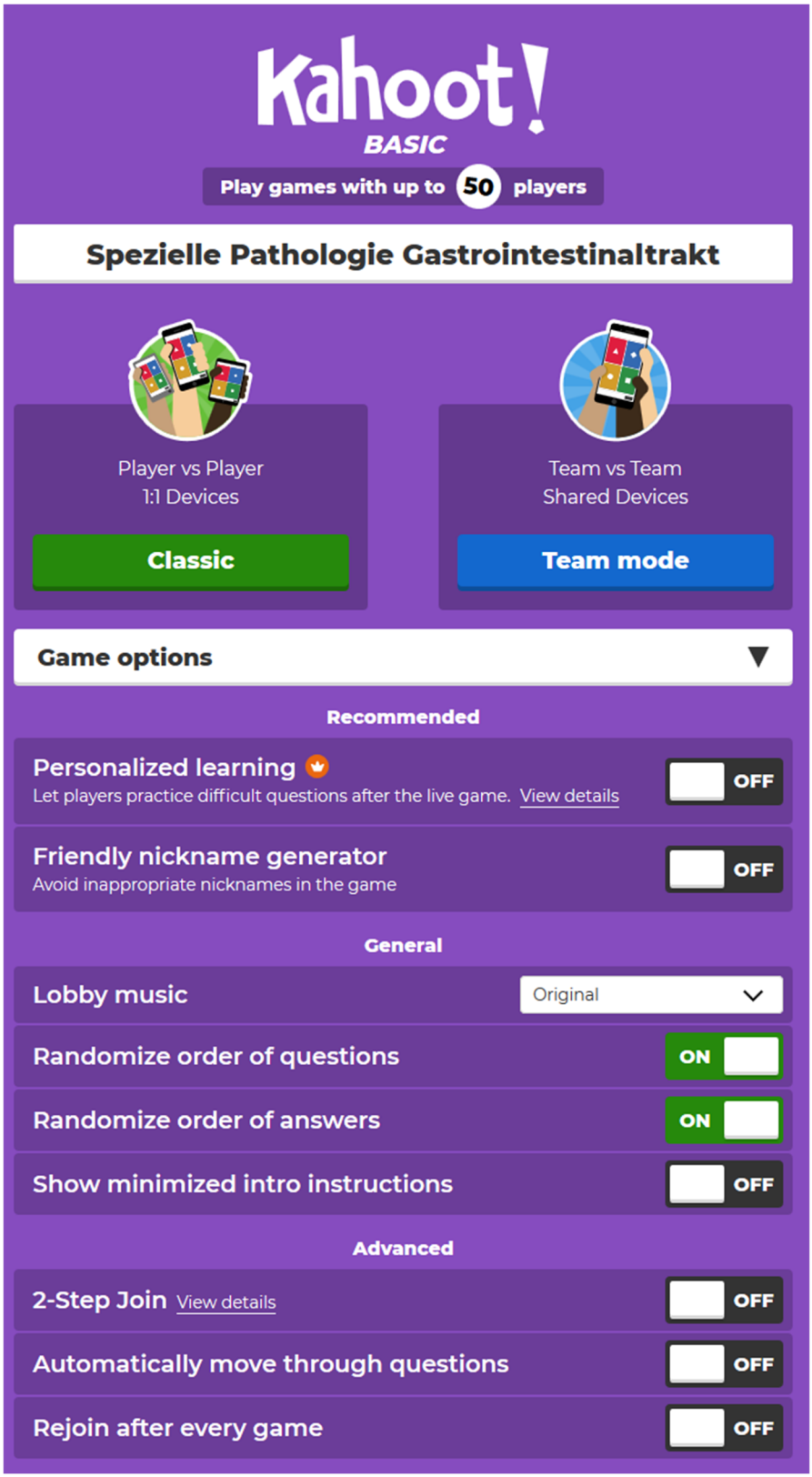
file name: **Additional Figure 1**
title of data: **Screenshot of Kahoot! settings.** For each lecture and round of questions, the “Player vs Player 1:1 Devices” has been chosen including randomization of questions and answers.

file name: **Additional Table 2**
title of data: **Kahoot! Questions.** Text- and histology-based questions for the different organ systems are listed including the correct answers (highlighted) which were accordingly set as “correct” in Kahoot!.

Additional Table 1: Topics of the pathology lectures in the current project. Details include the organ or anatomic region as wells as the tumor entity that were subject in the lectures where this study was conducted.

Topic	**Organ or anatomic region**	**Tumor entity**
Gastro-intestinal tract ('GAST')	Liver	1. Hemangioma
		2. Hepatocellular carcinoma
	Esophagogastric junction	3. Barrett esophagus
	Stomach	4. Intestinal adenocarcinoma
	Appendix	5. Neuroendocrine tumor
	Salivary gland	6. Pleomorphic adenoma
Skin ('DERM')	Skin	7. Verruca vulgaris
		8. Basal cell carcinoma
		9. Squamous cell carcinoma
		10. Malignant melanoma
Urogenital tract ('UROG')	Urinary bladder	11. Papillary urothelial lesions
		12. Invasive urothelial carcinoma
	Kidney	13. Papillary renal cell carcinoma
	Prostate gland	14. Prostate cancer
Hematology ('HEMA')	Lymph node	15. Chronic lymphatic leukemia
		16. Diffuse large B-cell lymphoma
	Bone marrow	17. Plasmocytoma/Plasma cell myeloma
	Lymph node	18. Hodgkin´s lymphoma

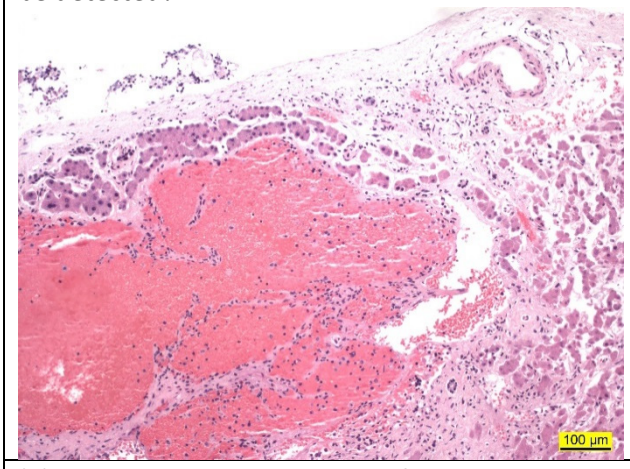
Additional Figure 1: Screenshot of Kahoot! settings. For each lecture and round of questions, the "Player vs Player 1:1 Devices" has been chosen including randomization of questions and answers. The title of the Kahoot! quiz ("Spezielle Pathologie Gastrointestinaltrakt") refers to the German title of the corresponding lecture and means "special pathology of the gastrointestinal tract".



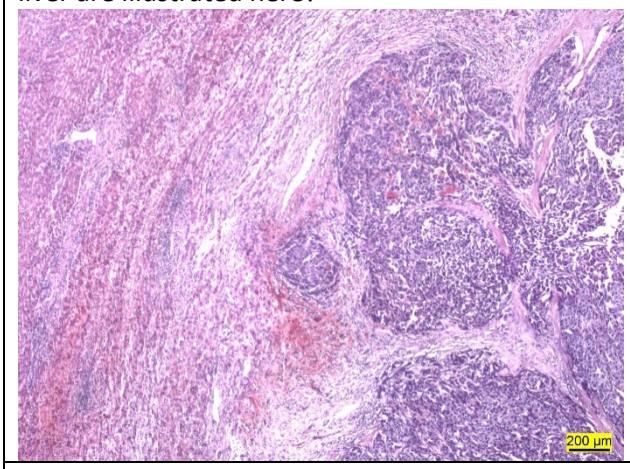
Additional Table 2: Kahoot! Questions. Text- and histology-based questions for the different organ systems are listed including the correct answers (highlighted) which were accordingly set as "correct" in Kahoot!.

(I) Gastrointestinal tract (GAST)

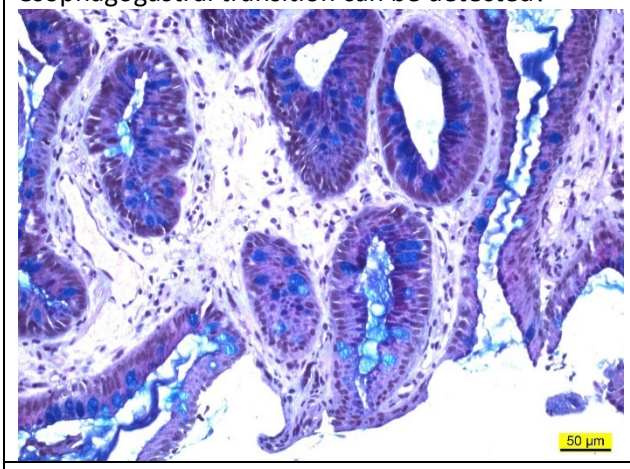
Hemangioma - liver

(1) Which kind of histomorphological changes can be detected?  	- Blood Vessels *(correct answer)* - Granulomas - Abscess - Necroses
(2) What is the best description for a hemangioma of the liver?	- Benign blood vessel tumor of the liver *(correct answer)* - Malignant blood vessel tumor of the liver - Epithelial tumor of the liver - Lymphatic tumor of the liver

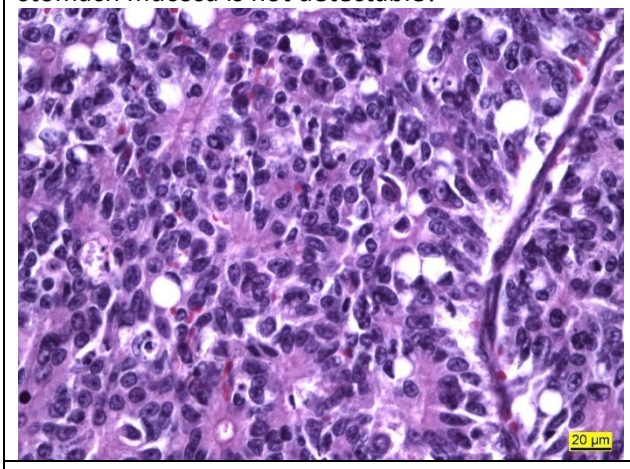
Hepatocellular carcinoma

1) What kind of histomorphological change in the liver are illustrated here?  	- Chronic inflammatory reaction - Connective tissue reconstruction - Increased iron deposition - Disordered cell growth *(correct answer)*
(2) Which description regarding the dignity of a hepatocellular carcinoma is correct?	- Benign tumor of the liver - Malignant tumor of the liver *(correct answer)* - Semi-malignant tumor of the liver - Borderline tumor of the liver

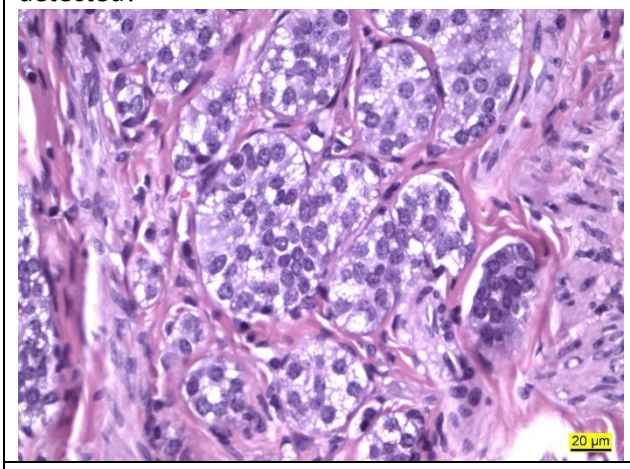
Barrett's oesophagus

1) Which histomorphological changes of the esophagogastral transition can be detected? 	- Mast cells - Goblet cells *(correct answer)* - Endocrine cells - Chief cells
(2) What is the correct description for the term Barrett's mucosa?	- Independence to reflux disease - Irreversible reactive process - Malignant metaplasia - Precursor to Barrett's carcinoma *(correct answer)*

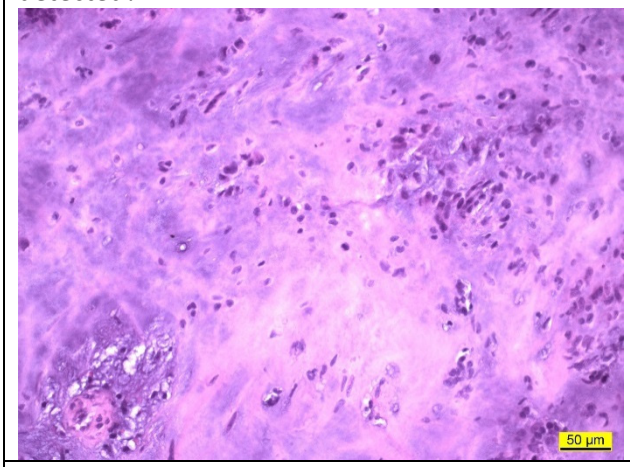
Gastric carcinoma - intestinal

1) Which histomorphological change of the stomach mucosa is not detectable? 	- Displaced nuclear-plasma relation - Regular gastric mucosa *(correct answer)* - Disorderly growth pattern - Enhanced nuclear pleomorphism
(2) Which statement regarding the intestinal adenocarcinoma of the stomach is correct?	- Epidemiological increase - Association with HP gastritis *(correct answer)* - The only type of gastric carcinoma - Lack of therapeutic options

Appendix carcinoid - Neuroendocrine tumor

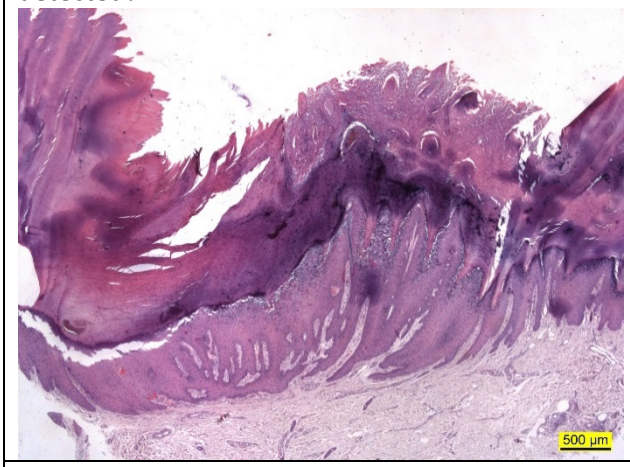
1) What histomorphological changes can be detected? 	- Neuroendocrine cells *(correct answer)* - Colon epithelial cells - Small intestine epithelial cells - Gastric epithelial cells
(2) Which statement regarding neuroendocrine tumors (NET) is correct?	- NETs have a malignant potential *(correct answer)* - NETs show specific symptomatology - NETS are predominantly localized in the appendix - The occurrence of NETs is equally distributed in all age groups

Pleomorphic adenoma

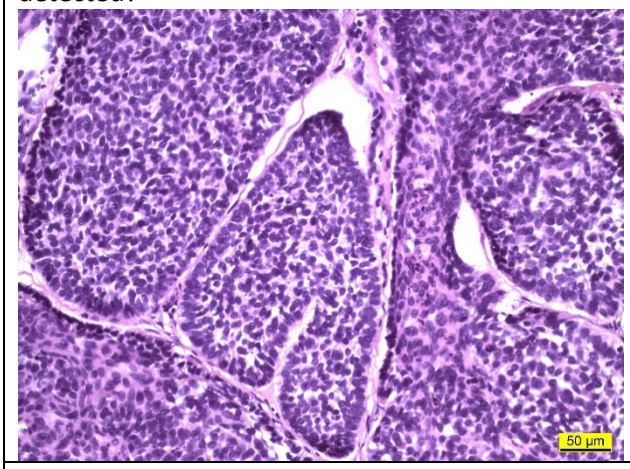
1) What histomorphological changes can be detected? 	- Acinar glands - Ductal glands - Hyaline cartilage *(correct answer)* - Mucus accumulations
(2) Which of the following statements regarding pleomorphic adenoma is correct?	- Malignant tumor of the salivary gland - Recurrence after incomplete ablation *(correct answer)* - Predominantly epithelial tumor component - Predominantly mesenchymal tumor component

(II) Skin (DERM)

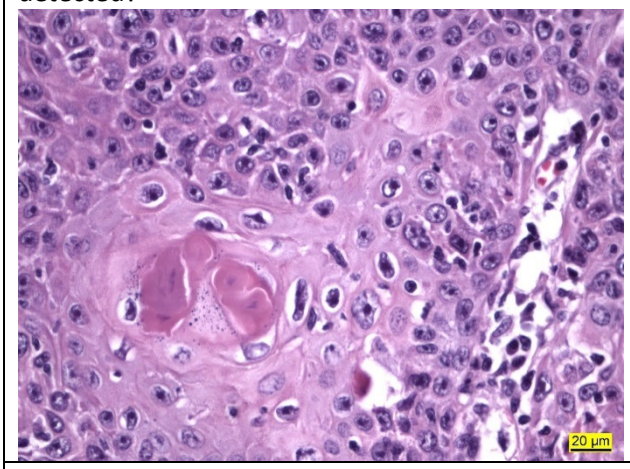
verruca vulgaris

(1) What histomorphological change can be detected? 	- Papillomatosis*(correct answer)* - Atrophy - Dysplasia - Metaplasia
(2) What is the correct description for verruca vulgaris?	- Benign skin alteration with virus association *(correct answer)* - Malignant skin change with virus association - Benign skin alteration without virus association - Malignant skin change without virus association

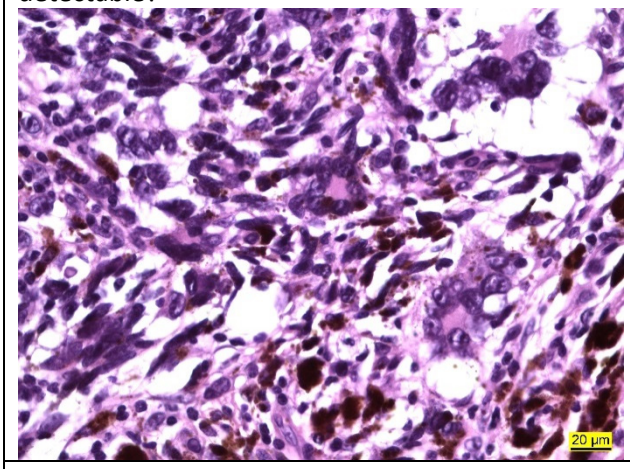
Basal cell carcioma

1) What histomorphological change can be detected? 	- Palisade-like position *(correct answer)* - Virus inclusions - Acanthosis - Infiltrative growth pattern
(2) Which of the following statements regarding basal cell carcinoma is correct?	- High UV association *(correct answer)* - Predominantly stem localization - High risk of metastasis - Rare tumor entity

Squamous cell carcinoma

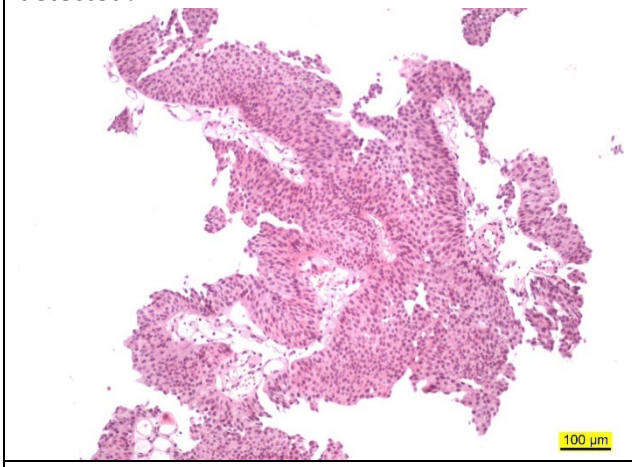
1) What histomorphological change can be detected? 	- Normal squamous differentiation - Regular cornification tendency - Abnormal plate-epithelial formations *(correct answer)* - Obtained basal membrane
(2) Which of the following statements regarding squamous cell carcinoma is correct?	- Good prognosis in advanced stages - Poor prognosis in early stages - Good prognosis for perineural invasion - Poor prognosis for lymph node metastases *(correct answer)*

Malignant melanoma

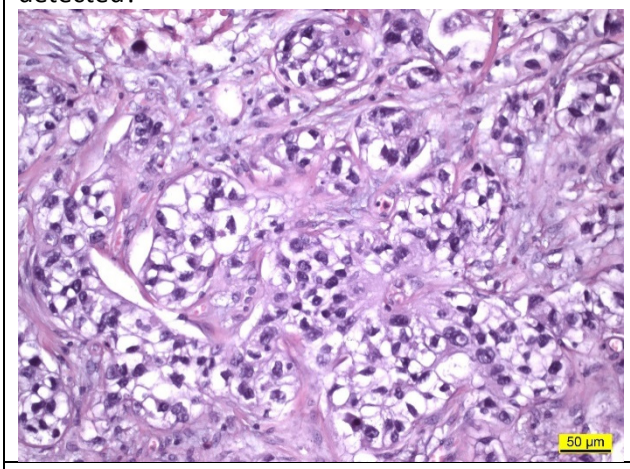
1) Which histomorphological change is not detectable? 	- Abnormal keratinocytes - Abnormal melanocytes *(correct answer)* - Abnormal lymphocytes - Abnormal endothelial cells
(2) Which of the following statements regarding malignant melanoma is wrong?	- Show different molecular subgroups - Clark-Level: Minimum penetration depth in millimeters *(correct answer)* - Breslow: Maximum penetration depth in millimeters - Metastasis risk depending on the depth of penetration

(III) Urogenital tract (UROG)

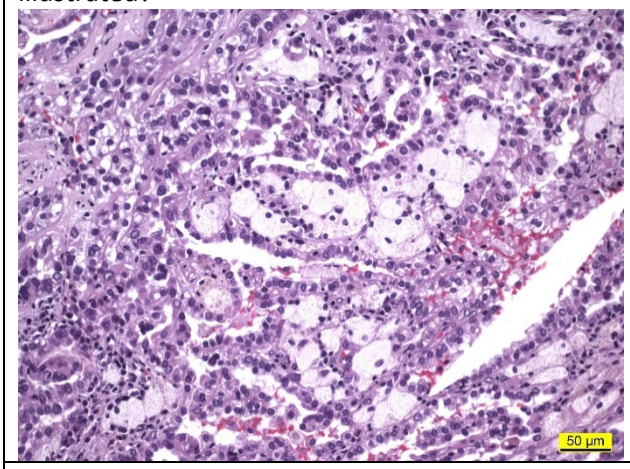
Papillary urothelial tumors

(1) What histomorphological change can be detected? 	- Papillary growth *(correct answer)* - Solid growth - Discohesive growth - Trabecular growth
(2) Which of the following statements regarding papillary urothelial tumors is correct?	- Possible invasive growth pattern *(correct answer)* - Mainly low-grade tumors - Mainly high-grade tumors - Flat growth pattern

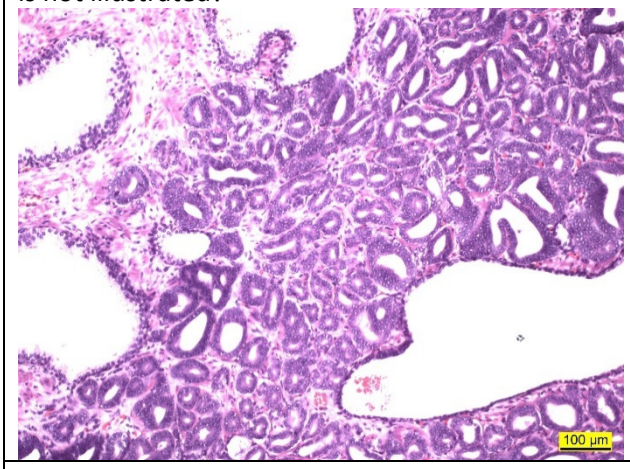
Invasive urothelial carcinoma

1) What histomorphological change can be detected? 	- Papillary tumor formations - Squamous epithelial differentiation - Urothelial differentiation *(correct answer)* - Cribriform tumor formations
(2) Which of the following statements regarding invasive urothelial carcinoma is correct?	- Relatively rare malignant tumor of the urinary bladder - Monomorphic malignant tumor entity - Association with chemicals *(correct answer)* - Overall extremely excellent prognosis

Renal cell carcinoma

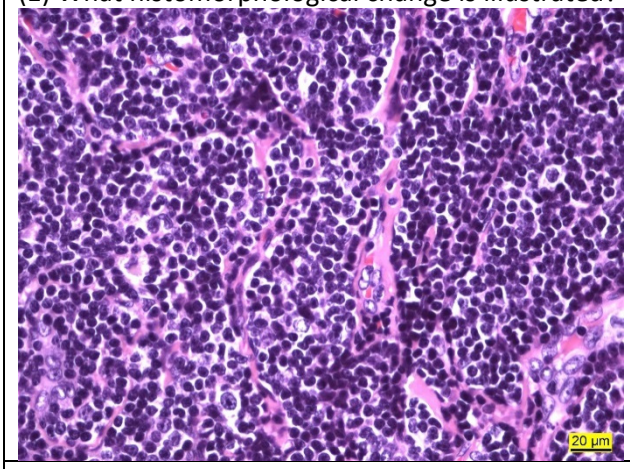
1) What histomorphological change is not illustrated? 	- Foam cell aggregates - Flat to cubic tumor cells - Fibrovascular axis - Glomerular structures *(correct answer)*
(2) Which of the following statements regarding renal cell carcinoma is correct?	- High association to blood vessels *(correct answer)* - High association with lymph vessels - High association with perineural sheaths - High association with renal tubules

Prostate carcinoma

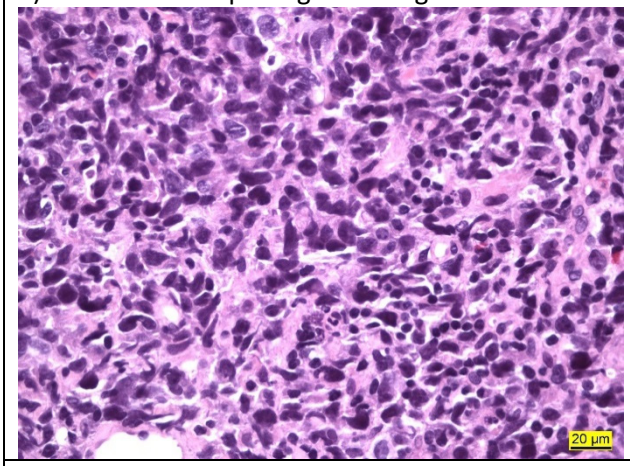
1) What histomorphological change in the prostate is not illustrated? 	- Abnormal acinar glands - Prominent Nucleoli - Increased mucus production *(correct answer)* - Enhanced nuclear pleomorphism
(2) Which of the following statements regarding prostate cancer is correct?	- Application of the so-called Gleason Grading *(correct answer)* - Predominant inner zone of the prostate - Typical lymph node metastasis - Cancer entity of young patients

(IV) Hematology (HEMA)

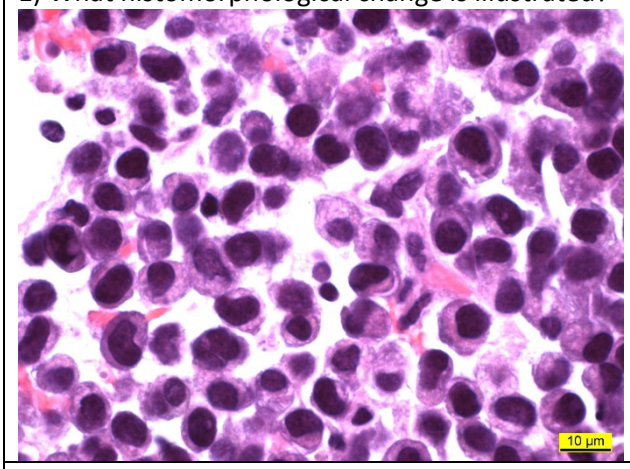
B-CLL

(1) What histomorphological change is illustrated? 	- Small cell monomorphic lymphatic cell population *(correct answer)* - Small cell pleomorphic lymphatic cell population - Large cell monomorphic lymphatic cell population - Large cell pleomorphic lymphatic cell population
(2) Which of the following statements regarding B-CLL is correct?	- Often symptomatic - Often aggressive - Often detectable in blood *(correct answer)* - Often detectable in mucous membranes

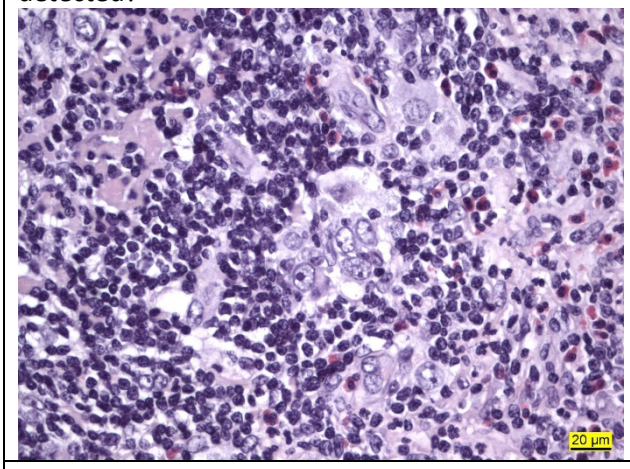
DLBCL

1) What histomorphological change is illustrated? 	- Small cell monomorphic lymphatic cell population - Small cell pleomorphic lymphatic cell population - Large cell monomorphic lymphatic cell population - Large cell pleomorphic lymphatic cell population *(correct answer)*
(2) Which of the following statements regarding diffuse large-cell B-cell lymphoma is correct?	- Monomorphic tumor entity - Predominantly nodal manifestation - Transformation of a low-aggressive lymphoma *(correct answer)* - Lack of therapeutic options

Plasmocytoma

1) What histomorphological change is illustrated? 	- Abnormal plasma cells *(correct answer)* - Abnormal epithelial cells - Abnormal mast cells - Abnormal lymphocytes
(2) Which of the following statements regarding plasmacytoma/plasma cell myeloma is wrong?	- Predominant bone association - Unknown precursor changes *(correct answer)* - Monoclonal bands in serum protein electrophoresis - Damage to terminal organs

Nodular sclerosing Hodgkin lymphoma

1) Which pathognomonic cell type can be detected? 	- Hodgkin cell *(correct answer)* - Langerhans cell - Epithelial cell - Carcinoma cell
(2) Which of the following statements regarding nodular sclerosing Hodgkin lymphoma is correct?	- T-cell of origin - Possible EBV infection/association *(correct answer)* - Extremely poor clinical prognosis - Primary bone manifestation