

Stiftung Tierärztliche Hochschule Hannover  
University of Veterinary Medicine Hannover, Foundation



## Pathologie des Harntraktes

- Fall 34 bis 38 -

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### Primäre Nierentumoren

- Selten; ca. 1% (Hund) bzw. 1,5-2,5% (Katze) aller Neoplasien
- I.d.R. maligne bei Hund, Katze und Pferd; benigne beim Rind
- Karzinome sind die häufigsten Nierentumoren bei Hund, Rind und Pferd; ca. 15% der epithelialen Nierentumoren des Hundes sind Adenome
- Geschlechtsdisposition ♂ > ♀ (Ausnahme Rind)

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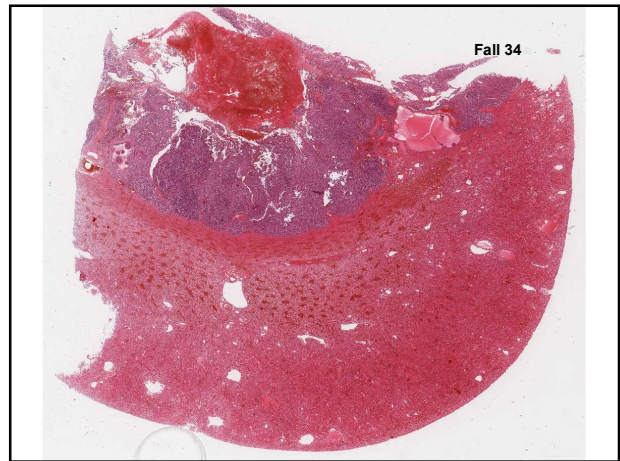
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### Häufigkeit von Nierentumoren bei Hunden und Katzen

	Primäre Neoplasien		Sekundäre Neoplasien
	Gesamt		Gesamt
<b>Hund</b>	32%	Epitheliale Tumoren 67% Mesenchymale Tumoren 26% Nephroblastom 6%	68%
		Benigne Tumoren 7% Maligne Tumoren 86%	
<b>Katze</b>	12%	Epitheliale Tumoren 61% Mesenchymale Tumoren 22% Nephroblastom 18%	88%
		Benigne Tumoren 5% Maligne Tumoren 78%	

Tumors of Domestic Animals, 5. Auflage, Donald J. Meuten

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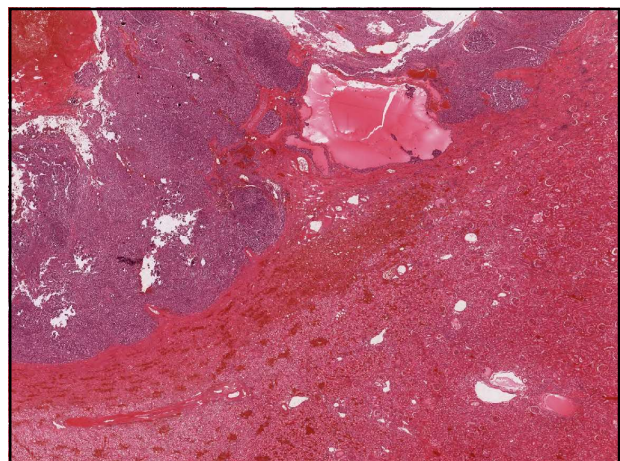
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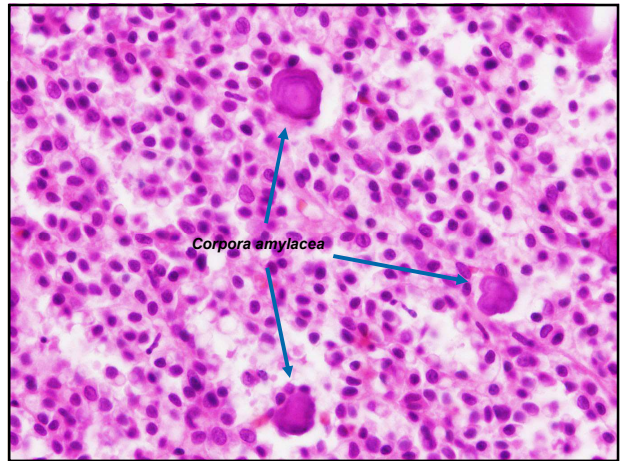
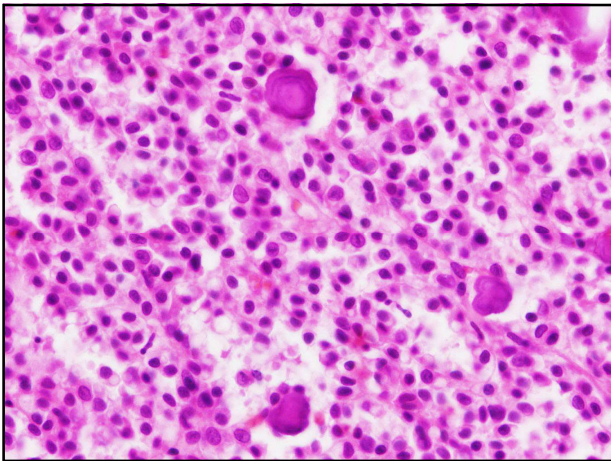
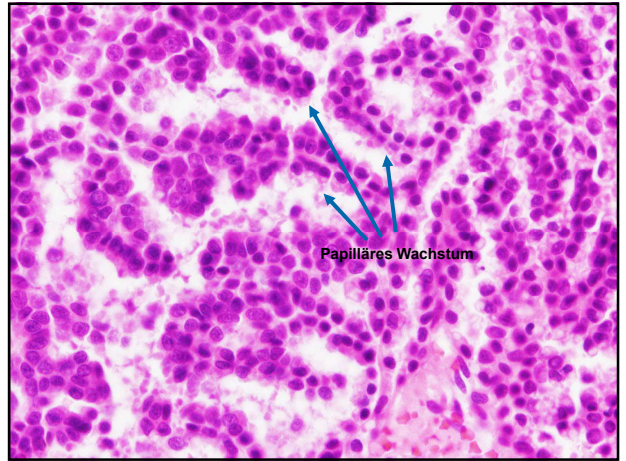
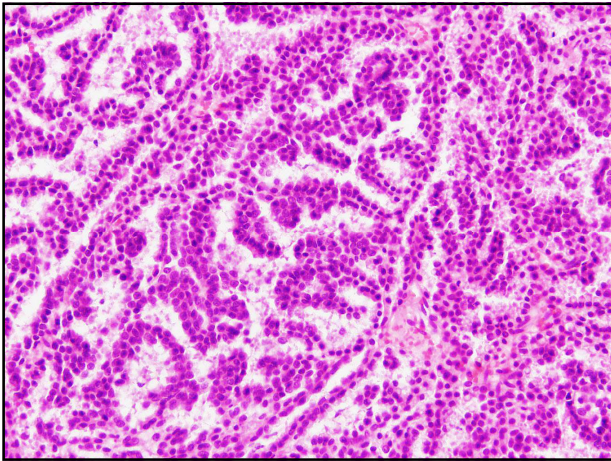
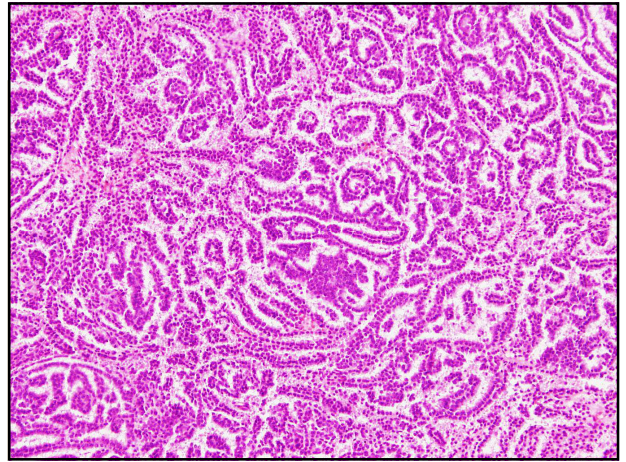
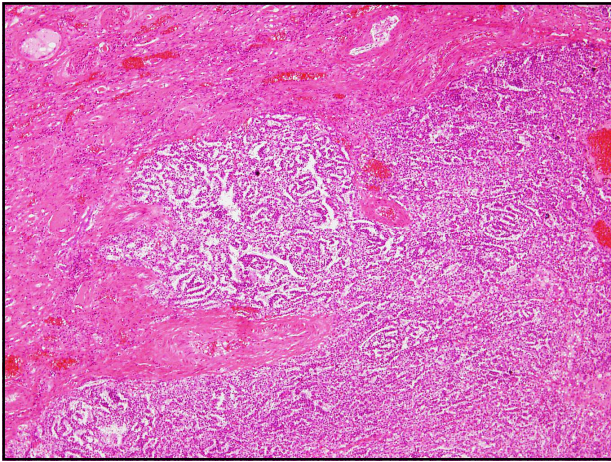
### Fall 34 – Hund

- Hund, 15 Jahre alt

**Vorbericht:** Inkontinenz, desorientiert

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Fall 34 – Hund

**Morphologische Diagnose:**  
Papilläres Nierenzelladenokarzinom

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Renales Karzinom beim Hund

**Vorkommen:** vorwiegend Rüden betroffen (2:1); Ø 8-9 Jahre; Inzidenz 0,3-1,5%

**Klinik:** abdominale Umfangsvermehrung, Hämaturie, Pyurie, Proteinurie; Anorexie, Gewichtsverlust, Erbrechen

**Metastasierung:** ca. 15-50%

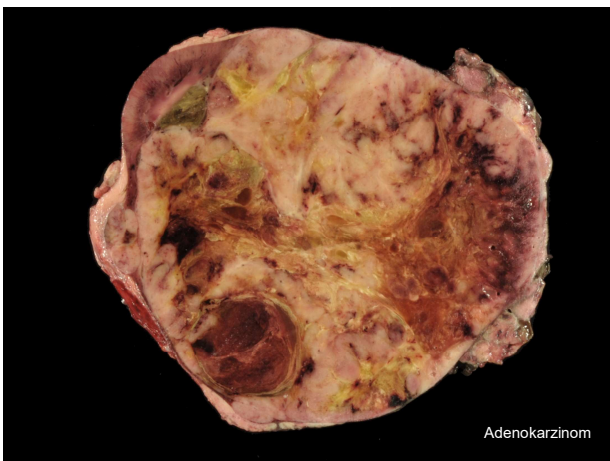
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Renales Karzinom beim Hund

**Paraneoplastische Syndrome:**  
Polyzythämie, paraneoplastische Leukozytose, hypertrophe Osteopathie, Hypoglykämie, Hyperkalzämie

**Makroskopie:** unilateral, seltener bilateral oder multiple; Durchmesser > 2cm, Nekrosen und Blutungen in größeren Karzinomen, Invasion des Nierenbeckens und der Gefäße

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Renales Karzinom beim Hund

Histologische Kriterien	Zytologische Kriterien	Malignitätskriterien
<ul style="list-style-type: none"> <li>Papillär</li> <li>Tubulär</li> <li>Multizystisch</li> <li>Solide</li> </ul>	<ul style="list-style-type: none"> <li>Chromophob</li> <li>Eosinophil</li> <li>Klarzell (!)</li> </ul>	<ul style="list-style-type: none"> <li>&gt;10 Mitosen/10 HPF</li> <li>Kernatypien</li> <li>Invasives Wachstum</li> <li>Metastasierung</li> </ul>

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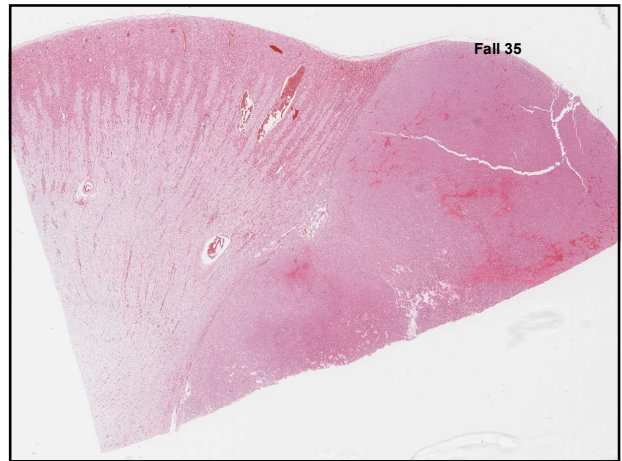
Renales Karzinom beim Hund

**Prognostic Significance of Histologic Features in Canine Renal Cell Carcinomas: 70 Nephrectomies**

E. F. Edmondson<sup>1</sup>, A. M. Hess<sup>2</sup>, and B. E. Powers<sup>1</sup>

**Abstract**  
 The prognostic significance of histologic and clinical features was evaluated in a retrospective study of 70 dogs treated with nephrectomy for renal cell carcinoma. Dogs presenting with hematuria and cachexia had significantly decreased overall and tumor-specific survival. Mitotic index (MI), nuclear size, nuclear pleomorphism, tumor differentiation, invasiveness, Fuhrman nuclear grade, and clear cell morphology were significantly associated with survival times (overall and tumor specific) in univariate analysis. A multivariate Cox proportional hazards model was constructed using stepwise selection to evaluate potential histologic predictor variables. This multivariate analysis revealed MI, defined as the number of mitotic figures in ten 400x fields, as the sole independent prognostic variable. Median survival for dogs with an MI >30 was 187 days compared with 1184 days for dogs with an MI <10. Dogs with an intermediate MI of 10 to 30 had a median survival of 452 days. Canine renal carcinomas were categorized into the following subtypes based on histologic features and histochemical and immunohistochemical staining: (1) clear cell, (2) chromophobe, (3) papillary, and (4) multilocular cystic renal cell carcinomas. Clear cell carcinoma was diagnosed in 6 of 70 (9%) canine tumors and was associated with a significantly decreased median survival time. Papillary carcinomas were identified in 15 of 70 tumors (21%), chromophobe in 6 of 70 (9%), and the multilocular cystic variant of canine renal cell carcinoma in 3 of 70 tumors (4%). These findings facilitate uniform categorization of canine renal cell carcinoma and provide veterinary pathologists with criteria to determine prognostic information.

09.03.2020 19

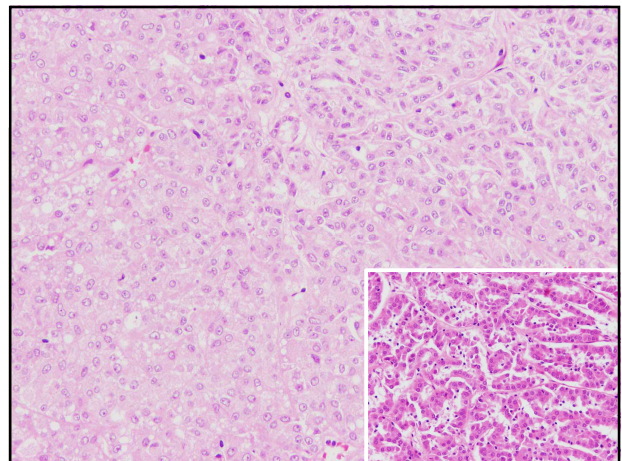
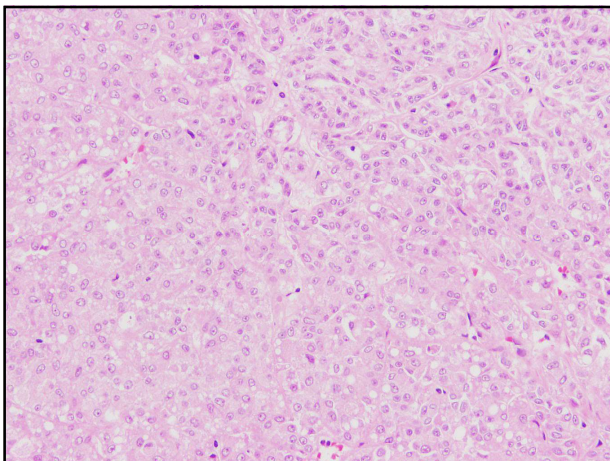
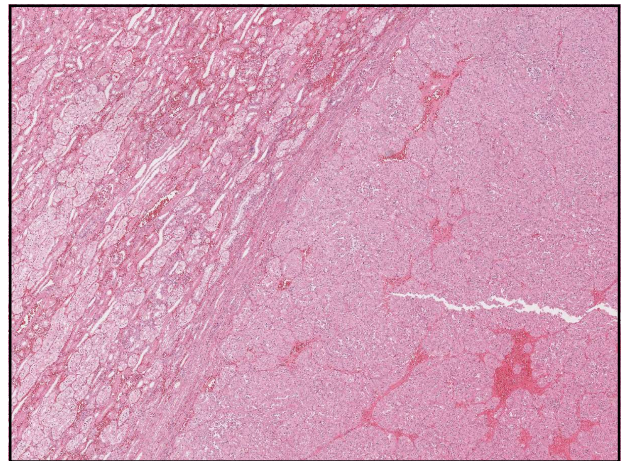


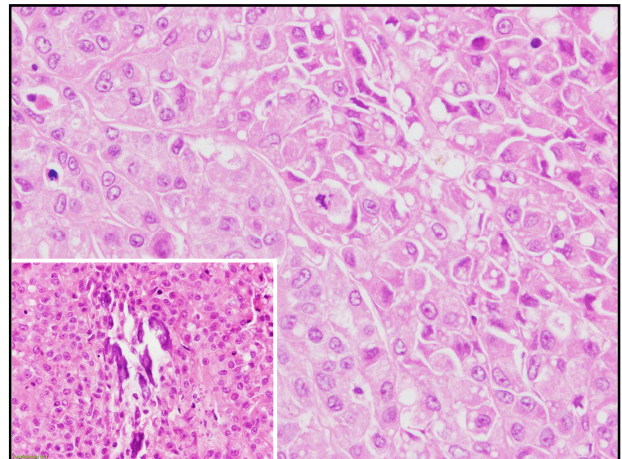
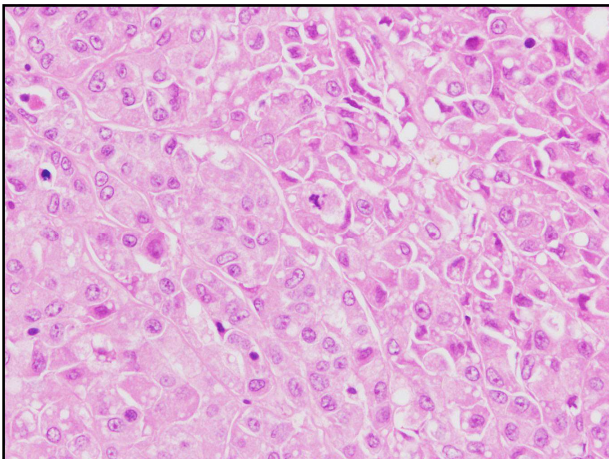
Fall 35 – Hund

- Hund, 10 Jahre alt


**Vorbericht: Umfangsvermehrung linke Niere**

09.03.2020 21





Fall 36 – Hund



**Morphologische Diagnose:  
Solides Nierenzelladenokarzinom**


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Welche immunhistologische Marker würden Sie zur Unterscheidung von Metastasen wählen?

- 1 - Pan-Zytokeratin und Vimentin
- 2 - Pax8 und Napsin A
- 3 - Uroplakin III und p63
- 4 - Wilms tumor gene WT1 und Zytokeratin 19

09.03.2020 28

Fall 34 – Hund



**Pax8, Napsin A, and CD10 as Immunohistochemical Markers of Canine Renal Cell Carcinoma**

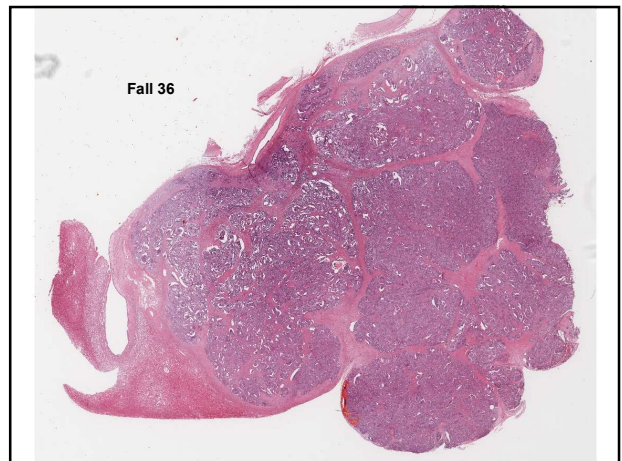
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www.blackwell-synergy.com

Tyler J. Peat<sup>1</sup>, Elijah F. Edmondson<sup>2,3</sup>, Margaret A. Miller<sup>1</sup>, Dee M. DuSold<sup>1</sup>, and José A. Ramos-Vara<sup>1</sup>

**Abstract**  
Pax8, napsin A, and CD10 are useful immunohistochemical markers of human renal cell carcinoma (RCC); however, their diagnostic utility in canine RCC is unclear. Forty formalin-fixed paraffin-embedded renal cell carcinomas from dogs (15 papillary, 12 solid, and 13 tubular) and 10 metastases were evaluated for expression of Pax8, napsin A, and CD10. Thirty-nine (98%), 24 (60%), and 19 (50%) tumors expressed Pax8 (nuclear labeling), napsin A (cytoplasmic labeling), and CD10 (cytoplasmic and membranous labeling), respectively. Pax8 was expressed in 72% of solid, 100% of papillary, and 100% of tubular tumors. Napsin A was expressed in 58% of solid, 60% of papillary, and 62% of tubular RCC. CD10 was expressed in 33% of solid, 47% of papillary, and 62% of tubular RCC. Pax8 was expressed in 80% of the metastatic tumors, napsin A in 60%, and CD10 in 50%. Additionally, Pax8 immunoreactivity was stronger overall than that of napsin A or CD10. In summary, Pax8 is a more sensitive marker than napsin A or CD10 for primary and metastatic canine RCC; its nuclear and more intense reactivity also makes it easier to interpret. Tubular and papillary RCCs were more likely than solid RCC to express all 3 markers. These findings highlight the utility of Pax8 as an immunohistochemical marker in diagnosing all major subtypes of canine primary and metastatic renal cell carcinoma.

**Keywords**  
dogs, neoplasia, immunohistochemistry, renal cell carcinoma, Pax8, napsin A, CD10

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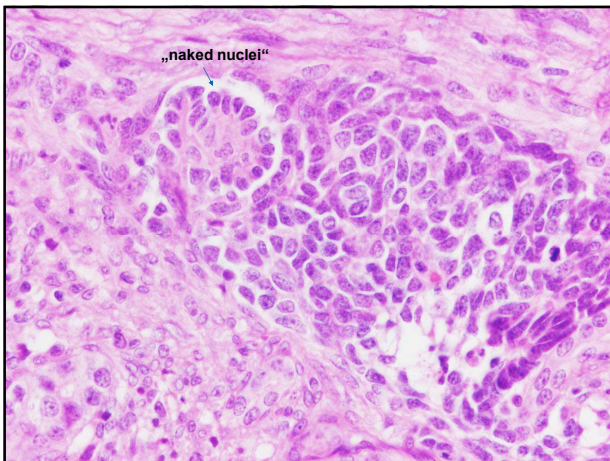
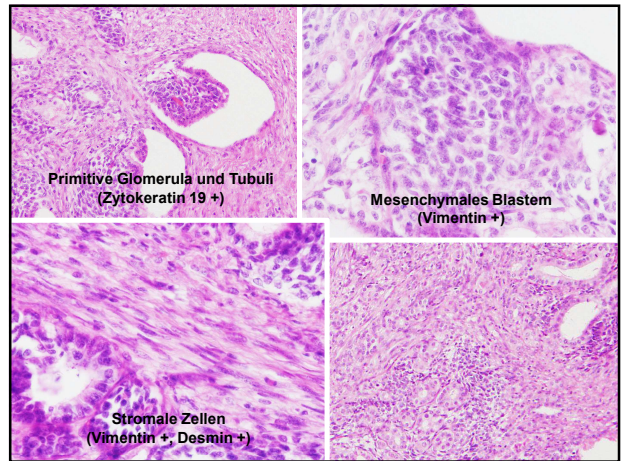
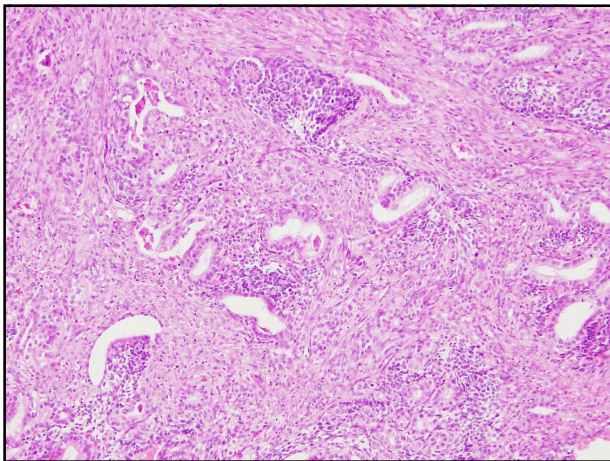
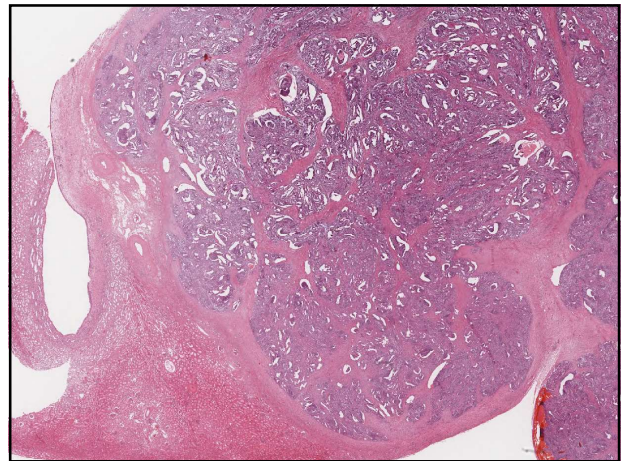


Fall 36 – Schwein

- Mastschwein

**Vorbericht:** Zufallsbefund bei Schlachtung

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Fall 36 – Schwein

**Morphologische Diagnose:**  
Renales Nephroblastom

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## Nephroblastom



**Vorkommen:** häufigste Nierentumor bei Schweinen, Hühnern und Fischen; zweithäufigste Nierentumor bei Katzen

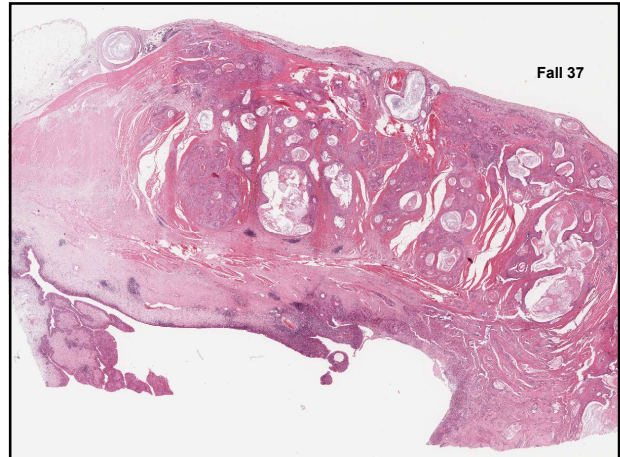
**Metastasierung:** selten bei Schwein und Geflügel; < 50% bei Hund und Katze

**Makroskopie:** unilateral, Kortex; lobuliert, weiß-braun, zystische Areale, feste Konsistenz, Nekrosen/Blutungen

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37



## Fall 37 – Hund



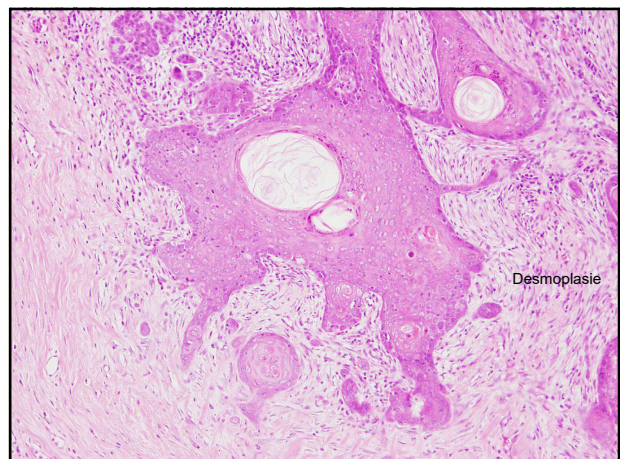
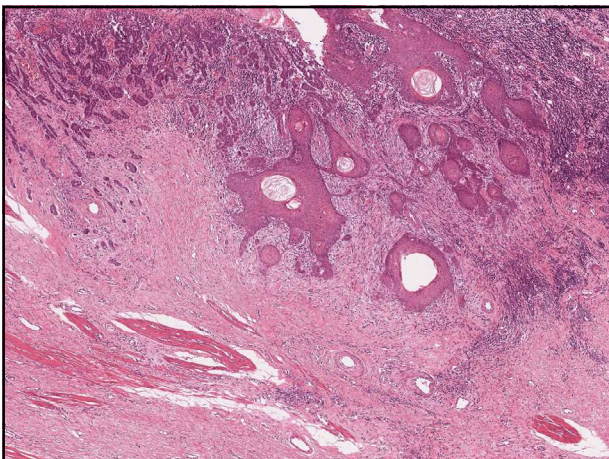
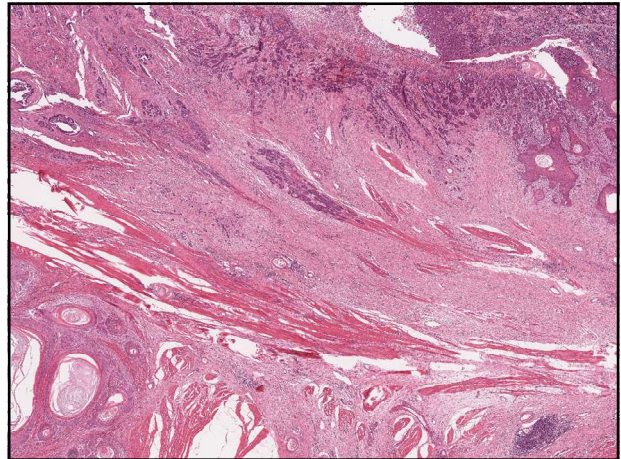
- Hund, 11 Jahre alt

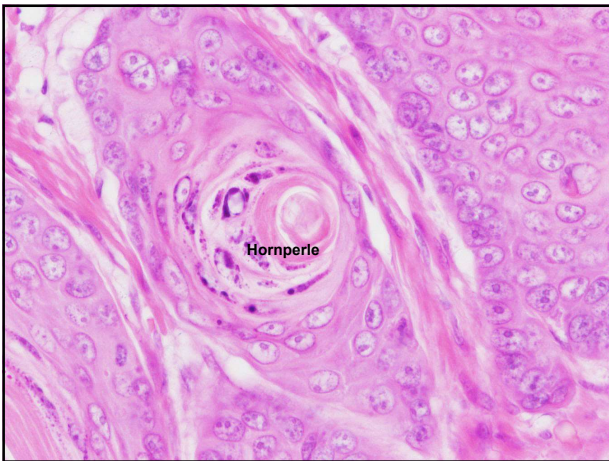
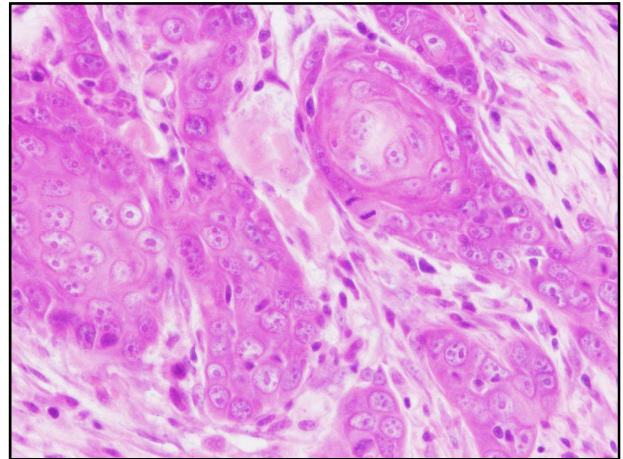
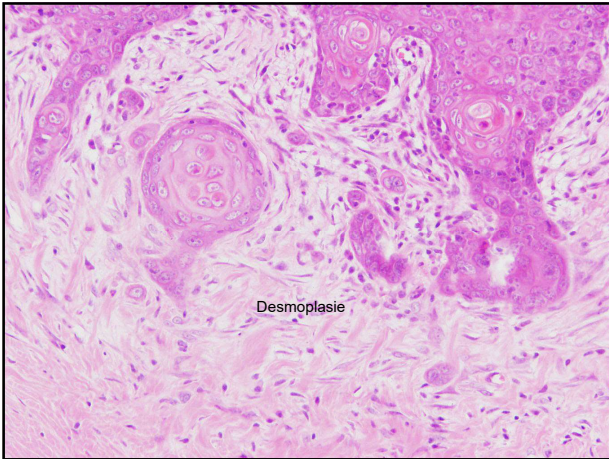
**Vorbericht:** Biopsie Harnblase, ohne weitere Angaben

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39



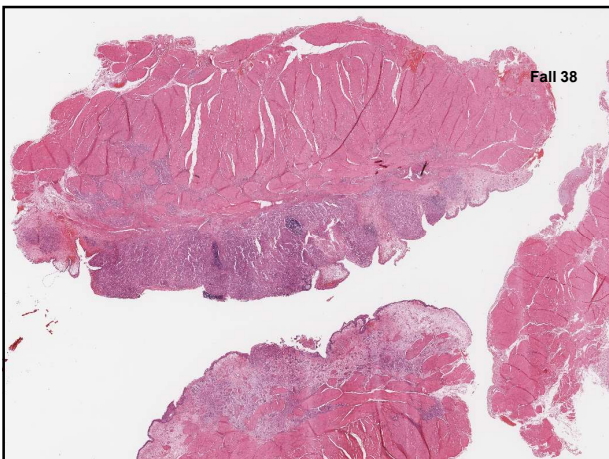


Fall 37 – Hund




**Morphologische Diagnose:**  
Plattenepithelkarzinom der Harnblase

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Fall 37 – Hund

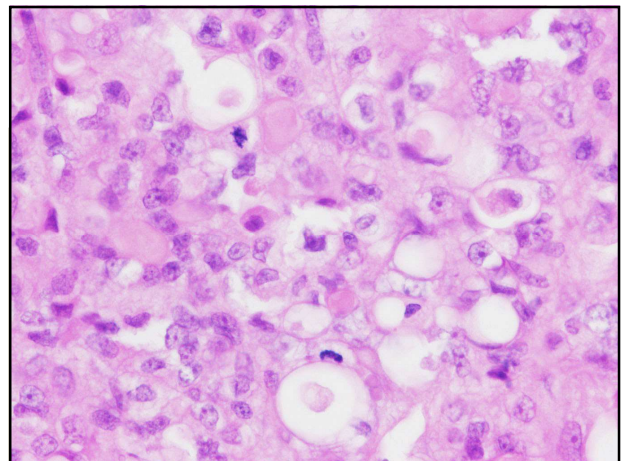
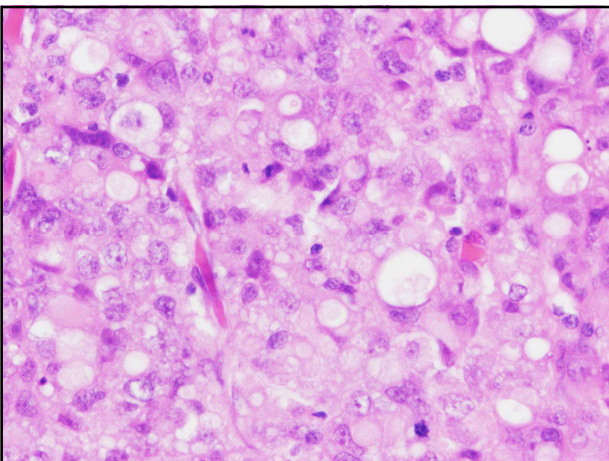
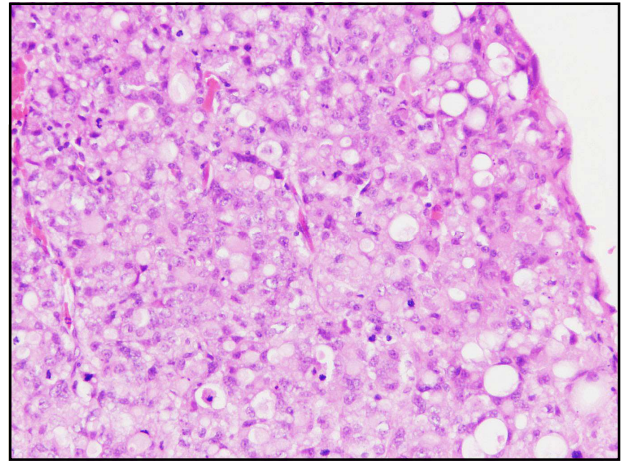
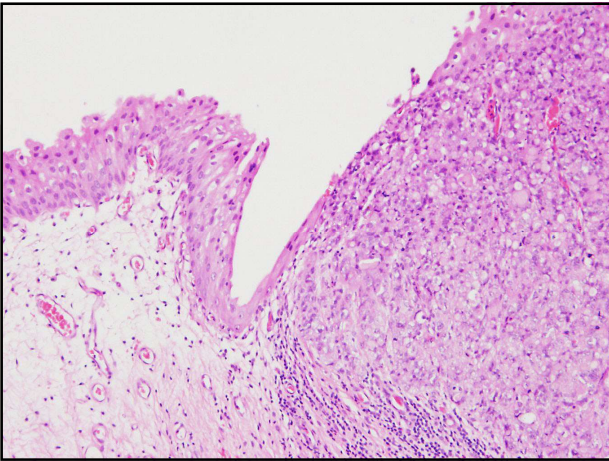
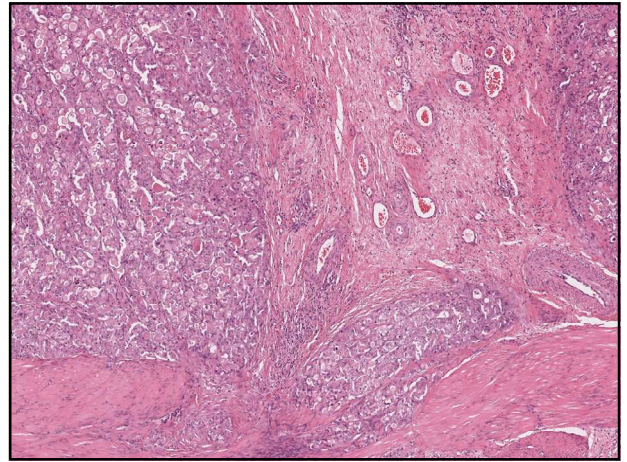
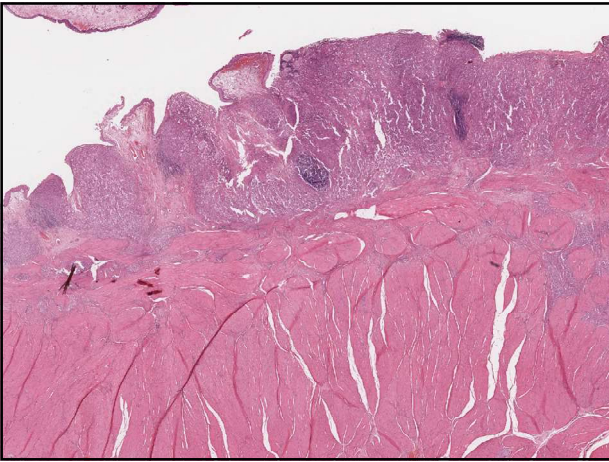


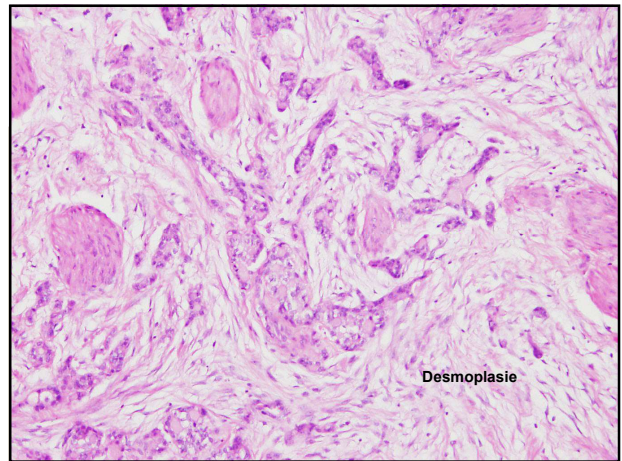
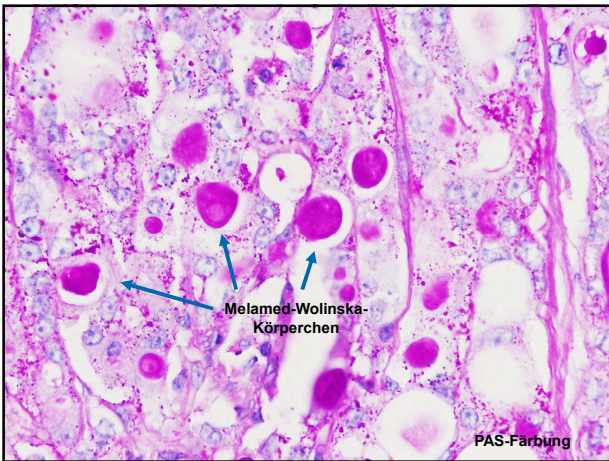
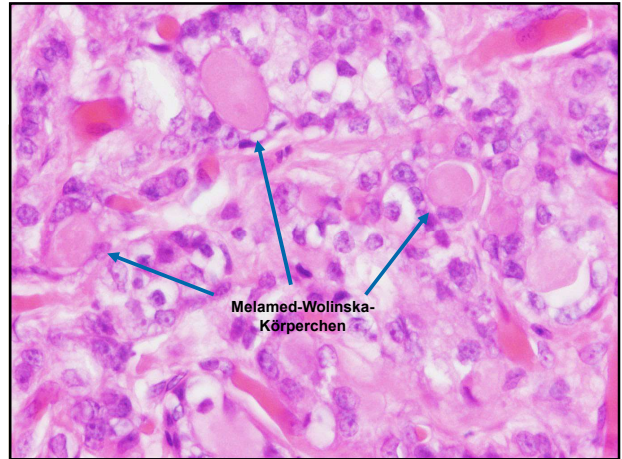
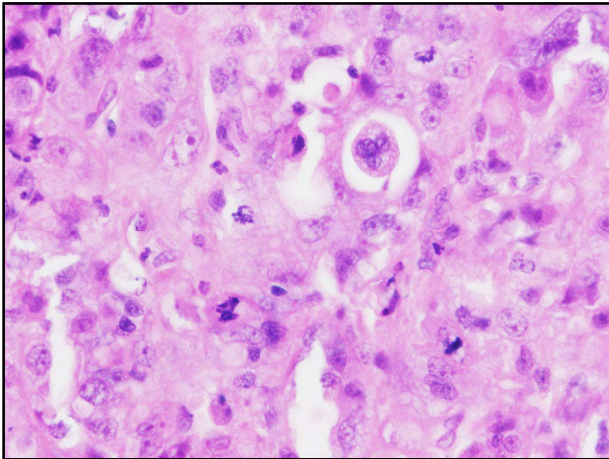
- Hund, 11 Jahre alt

**Vorbericht:** Biopsie Harnblase, ohne weitere Angaben


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Fall 38 – Hund



**Morphologische Diagnose:**  
**Übergangszellkarzinom**  
**(Urothelkarzinom) der Harnblase**

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Harnblasentumoren beim Hund



- ca. 90% der Harnblasentumoren sind epithelial und maligne
- Übergangszellkarzinome:
  - 9-10 Jahre alte Hunde betroffen
  - Harnblase > Nierenbecken, Prostata, distale Urethra
  - *Trigonum vesicae* => Obstruktion der Harnblase; bilaterale Hydronephrose
  - Metastasierung: ca. 20% bei Diagnosestellung; Lunge (50-90%), Lymphknoten (25-40%), Knochen (10%), Haut (10%); Überlebenszeit 100 Tage (Chirurgie)
  - Risikofaktoren: topische Insektizide, Adipositas, Hunderasse (Scottish Terrier), Cyclophosphamid

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## Übergangszellkarzinom (Urothelkarzinom) beim Hund



	Papillom	Gut-differentes Karzinom	Wenig-differenziertes Karzinom
Zelllagen	≤ 7	> 7	> 7
Wachstum	Papillär; regulär	Papillär oder flach; regulär	Papillär oder flach, Verlust der Polarität
Atypien (zellulär, nukleär)	keine	Gering - mittelgradig	Deutlich; ausgeprägter Kernpolymorphismus
Mitosen	keine	Keine oder wenige	zahlreiche
Invasives Wachstum	nein	nein	Ja; Infiltration von Blut oder Lymphgefäßen

Tumors of Domestic Animals, 5. Auflage, Donald J. Meuten