

**Supplementary Table S1.** A checklist for generating cell patches in order to include various histologic features of urinary tract cancer in the developmental cohort

<b>Tissue condition</b>
1. Fixation
Well-fixed
Poorly-fixed
2. Cauterization effect
Present
Absent
3. Focusing
Well-focused
Partially focused out
4. Tissue section thickness
Thick
Thin
5. Tearing
Present
Absent
6. Background
Clear
Hemorrhagic
Degenerative
Necrotic
7. Location
In tissue
Floating in the background
8. Cellularity
High
Low
<b>Cancer cells</b>
1. Cell shape
Round to ovoid
Polygonal
Spindle
2. Cohesiveness
Cohesive
Overlapping
Poorly cohesive
3. Cell membrane
Distinct
Indistinct
4. Mitosis
Present
Absent
5. Nucleoli
Prominent
Inconspicuous
6. Chromatin
Fine
Coarse
Vesicular

7. Cytoplasmic hue
Eosinophilic
Amphophilic
Basophilic
Clear
8. Cytoplasm amount
Abundant
Moderate
Scant
<b>Mesenchyme</b>
1. Location
Intra-tumoral
Peri-tumoral
Extra-tumoral
2. Structure
Adipose tissue
Muscularis propria
Muscularis mucosae
Large vessel
Small vessel
Papillary core
Nerve
Granulation tissue
3. Reaction
Desmoplastic
Hyalinized
Myxoid
Edematous
<b>Immune cells</b>
1. Location
Intra-tumoral
Peri-tumoral
Extra-tumoral
2. Structure
Aggregated
Follicle
3. Cell type
Neutrophil
Eosinophil
Mature lymphocyte
Histiocyte