**Introduction**

- Transient receptor potential vanilloid subtype 4 (TRPV4) is a non-specific cation channel that is located in the epithelium of the urinary bladder, the ureter and the distal section of the kidney tubuli.
- Transgenic TRPV4 deficient mouse have a phenotype that displays bladder dysfunction.
- Therefore TRPV4 channels are being investigated as a mechanoreceptor in the bladder and as a potential pharmacological target for OAB.
- Previous research has demonstrated a molecular connection between TRPV4 and barrier forming adherence junctions (AJ's) in all above mentioned tissues and abnormal cell junction formation in the skin epithelium of TRPV4 deficient mice.

**Materials & Methods**

- Non cancerous tissue sections from human cystectomies (n=4), ureterectomies (n=1) and nephrectomies (n=2)
- Kidney and bladder tissues from wild type and TRPV4 deficient mice (TRPV4 -/-)
- The location of TRPV4, Adherence Junctions (AJs) and Tight junctions (TJs) was investigated with immunofluorescence assays, Western blotting and TEM imaging.

**Aim of this study**

To investigate cell junction formation in the urogenital tract of humans and in TRPV4 knockout mice.

**Results**

- TRPV4 co-localizes with adherence junctions throughout the urogenital tract (Fig 1, 3)
- Immunofluorescence assays demonstrated a qualitative and quantitative reduction of cell junction formation (both AJ and TJ) in TRPV4 -/- kidney and bladder epithelia (Fig 2)
- TEM evaluation confirmed this and showed a remarkable increase in intercellular space between adjacent urothelial cells of the TRPV4 -/- mouse bladder (Fig 4).

**Conclusions**

- TRPV4 channels are connected to epithelial adherence junctions throughout the urogenital tract and play a role in cell junction formation.
- These results suggest that TRPV4 channels, besides being important for sensory functions, is also involved in the formation of the epithelial barrier of the urogenital tract.