Establishment of a culture method of dog bladder cancer organoids

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【Introduction】 Bladder cancer (BC) is the most common neoplasm affecting the urinary tract of dogs. Stem cell-derived 3D organoid culture could recapitulate organ structure and physiology. In our previous study, urine sample-derived dog prostate cancer organoids have been established. However, urine-derived dog BC organoids have never been developed. We therefore generated dog BC organoids using the urine samples.

【Methods and Results】 After dogs were clinically diagnosed with bladder tumor, urine samples were collected by catheterization and used for the organoid culture. Organoids from each BC dog were successfully generated. Expression of an epithelial cell marker (E-cadherin) and a myofibroblast marker (α -smooth muscle actin, (SMA)) was confirmed in the organoids. The organoids also expressed a stem cell marker (CD44). Injection of the BC organoids into immunodeficiency mice successfully generated tumor. While treatment with cisplatin and vinblastine decreased cell viability of organoids in a dose-dependent manner, treatment with gemcitabine and piroxicam had little effect on the cell viability of the organoids.

【Conclusions】 These findings revealed that BC organoids derived from urine stem cells might become a useful tool to investigate the mechanisms of pathogenesis and treatment of dog BC