Study of Anti-proliferative Effects of Traditional Chinese Medicine and Crude Drug Extract on Dog Bladder Cancer Stem Cells

Yuta Shinohara[1,2], Elbadawy Mohamed[1,3], Megumi Yamanaka[1], Yuta Goto[1], Kimika Hayashi[1], Abugomaa Amira[1], Tatsuya Usui[1], Kazuaki Sasaki[1]

[1]Dept. Vet Med., Fac. agr., Tokyo Univ of Agr and Tech., [2]Division. Pet Health and Food., Iskara Industry CO., LTD., [3]Dept. Pharm., Fac. Vet med., Benha Univ.

【Background】

Since the malignancy of dog bladder cancer (BC) is higher than human BC, most BC bearing dogs die early. In our laboratory, we established the method of bladder cancer organoid culture using the cancer stem cells in their urine samples and demonstrated the organoids can be used for an anti-cancer drug sensitivity test. On the one hand, the usage of traditional Chinese medicine has been increasing in veterinary medicine. Although not a few veterinarians use traditional Chinese medicine for cancer, little is known about direct effects and detailed mechanisms of traditional Chinese medicine on dog cancer cells and cancer stem cells.

【Object】

The purpose of this study is to clarify the effects of traditional Chinese medicines on BC bearing dogs by examining the effects of several traditional Chinese medicines, traditional Chinese medical supplements and crude drug extracts using a dog BC organoid culture system.

【Methods and Results】

Dog BC organoids were treated with 39 kinds of traditional Chinese medicines, traditional Chinese medical supplements and crude drug extracts (10- 100 mg/ml) for 72 hours, respectively. The cell viability of the organoids was assessed by Alamarblue assay. Among these drugs and supplements, treatment of shibe-ria and ro-ka suppressed cell viability of dog BC organoids in a concentration-dependent manner.

【Discussion】

We for the first time demonstrated that traditional Chinese medical supplements, shibe-ria and ro-ka had suppressive effects of dog BC stem cells.