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Chemotherapy induces phenotypic alterations of tumor cells that facilitate antitumor T cell responses in a mouse model of oral cancer

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Gemcitabine (GEM) is a pyrimidine nucleoside analogue that is a new chemotherapeutic agent used for treating various cancers. Because accumulating evidence indicates that GEM may activate host immune responses, its potential as an immune modulator in cancer chemotherapy has generated considerable interest. In the present study, we investigated the antitumor effects of GEM using a mouse oral cancer model using immunological analysis. We examined apoptotic cell death of tumor cells with GEM treatment both *in vitro* and *in vivo*. We also investigated whether *in vivo* administration of GEM affected the distributions of immune cells, tumor-cell surface expression levels of immune accessory molecules and T cell immune responses in tumor-bearing mice. GEM induced significant oral cancer-cell apoptosis *in vitro*, and *in vivo* GEM administration markedly attenuated established mouse tumor growth. *In vivo* GEM administration decreased the numbers of both myeloid-derived suppressor cells (MDSCs) and B cells in tumor-bearing mice and enhanced dendritic cell maturation. Moreover, GEM treatment upregulated tumor-cell surface expressions of several immune accessory molecules and adhesion molecules, including CD80, CD86, CD40, ICAM-1, VCAM-1, and P-selectin. Remarkably, these tumor cells augmented tumor specific T-cell responses. These results suggest that GEM can induce host antitumor immune responses, which would facilitate antitumor effects in the treatment of oral cancer.

Biography

Kei Tomihara received his PhD degree in 2006 from Sapporo Medical University, working on immune gene therapy by adenovirus vector. He then moved to Cancer Therapy and Research Center (CTRC) at The University of Texas Health Science Center at San Antonio (UTHSCSA) to work with Dr. Shin as a Post-doctoral fellow. He obtained an Assistant Professor position in 2013 in the Department of Oral and Maxillofacial Surgery Graduate School of Medicine and Pharmaceutical Sciences for Research, University of Toyama, where he started independent research on cancer immunology.

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