Optimization of Cancer Immunotherapy Based on Trafficking and Distribution Control of Immune Cells

○Naoki Okada and Shinsaku Nakagawa
(Dept. Biopharm., Grad. Sch. Pharm. Sci., Osaka Univ.)

The development of cancer immunotherapy is briskly pushed forward worldwide. However, excellent therapeutic efficacy, evidenced by marked tumor regression and complete response, has not been reported in a clinical setting to date. One potential cause of these disappointing results is insufficient investigation and understanding of methods that improve accumulation of immune effector cells in tumor tissue, because most conventional studies of cancer immunotherapy have focused on efficient induction and activation of immune effector cells. Even if effector cells exhibiting the ability to kill tumor cells were adequately induced in a patient, the efficacy of cancer immunotherapy would be considerably limited if these effector cells were unable to infiltrate tumor tissue and thereby come in contact with tumor cells. Therefore, by applying chemokine-chemokine receptor coupling, which regulates leukocytic migration and infiltration of local sites in the living body, into cancer immunotherapy, we are attempting to establish the innovative concept, "Cell Delivery System", capable of better controlling the trafficking and biodistribution of immune effector cells for overcoming the limitations of current therapies. In this paper, as an example of the Cell Delivery System, we will present approaches for improving the efficacy of cancer immunotherapy through the augmentation of tumor-infiltrating immune cells due to intratumoral transduction of chemokine gene using RGD fiber-mutant adenoviral vectors.