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Dendritic cell-based cancer immunotherapy

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Despite the significant recent advances in the therapeutics for cancer, it still remains extremely difficult to treat advanced cancers with organ involvement and distant metastasis. A manufacturing technology for antigen-presenting cell (APC)-based immunotherapy is being developed, with active dendritic cell (DC), the most potent APCs of the immune system, being under investigation for therapeutic vaccination against cancer for strong induction of the T-cells against tumor antigens. The ex vivo technique is being developed for DC-based cancer vaccination, most of which is the preparation of autologous mature monocyte-derived DCs derived from apheresis of patients' blood. Cancer vaccine therapies are principally attributed to the presence of tumor-associated antigens. Wilms tumor 1 (WT1), an attractive target antigen widely expressed in every cancer, sarcoma and leukemia has been shown to the most potent cancer-associated antigens for immunotherapy. DC vaccine loaded with HLA class I/II-restricted WT1 peptides may be potentially strong therapeutic activity against cancers. DC-based immunotherapy targeting WT1 was indicated to be safe and feasible for the management of advanced cancers including pancreas, lung and ovary, exhibiting 'delayed separation' curve in some patients. The vaccination would be feasible option even for patients with malignant brain tumor and acute leukemia after hematopoietic stem cell transplantation to control minimum residual disease. In future, the blockade of immune checkpoints in combination with DC-vaccination would be promising therapeutic strategies to activate therapeutic anti-tumor immunity for advanced cancers and hematological malignancies.

Biography

Shigetaka Shimodaira has graduated from Shinshu University School of Medicine, Japan. He has received MD in 1990, specialized in Hematology and Oncology at the Graduate School of Medicine of Shinshu University and received PhD in 1997. He has studied the pathogenesis of HCV in the USC, CA from 1999 to 2001. He also conducted educational and clinical activities to promote transfusion medicine in the Shinshu University Hospital since 2002. He became the Director of Advanced Center for Cell Therapy in the Shinshu University Hospital, 2011. He is working as Professor of Advanced Center for Cell Therapy, Shinshu University Hospital since 2013.

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