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Personal therapeutic cancer vaccine: Autologous dendritic cells and antigens from autologous self-renewing cancer cells

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AIVITA Biotechnology has a platform technology for patient-specific therapeutic anti-cancer vaccines. Each vaccine is unique in that the tumor antigens are derived from self-renewing autologous tumor cells (cancer stem cells and progenitor cells) to address challenges and limitations that result from tumor initiating cells and interpatient tumor heterogeneity, which limit the efficacy of existing therapies. Each vaccine product is "personal" rather than "personalized." Short-term autologous tumor cell lines are now established reliably from fresh tumor samples, and dendritic cells are reliably differentiated from peripheral blood mononuclear cells (PBMC). Personal DC-ATA (dendritic cells-autologous tumor antigens) can now be manufactured and released within three weeks of collection of tumor and PBMC. Each dose is admixed with granulocyte-macrophage colony-stimulating factor (GM-CSF) prior to injection. For now, ideal patients are those with cancers for which surgery continues to be a major component of treatment for advanced diseases, such as hepatocellular cancer, renal cell cancer, metastatic melanoma, ovarian cancer, glioblastoma (GBM), soft tissue sarcomas, and cancers that metastasize to skin, liver, lung, and brain. To date, 186 patients have received 1200 subcutaneous injections of personal DC-ATA. Key observations include confirmation of feasibility for collection of tumor and PBMC and shipping of vaccine doses to distant sites in multicenter trials; safety in various clinical settings including concurrently with other anti-cancer therapies and in the setting of hepatitis-B viral infection; delayed objective complete tumor regression in some patients with measurable disease at the time of treatment, prolonged progression-free survival compared to historical controls in GBM, and prolonged overall survival in melanoma compared to historical controls and to an autologous tumor cell vaccine in a randomized trial. This presentation will review the evolution of these personal therapeutic cancer vaccines and the results from various clinical trials.

Recent Publications

1. Robert O Dillman, et.al, (2020): Insights from immuno-oncology: the Society for Immunotherapy of Cancer Statement on access to IL-6-targeting therapies for COVID-19, J Immunother Cancer; 8(1).

2. Robert O Dillman, et.al, (2020): Cytokine network analysis of immune responses before and after autologous dendritic cell and tumor cell vaccine immunotherapies in a randomized trial, J Transl Med; 18(1):176

3. Robert O Dillman, et.al, (2020): Genomic, proteomic, and immunologic associations with a durable complete remission of measurable metastatic melanoma induced by a patient-specific dendritic cell vaccine, Hum Vaccin Immunother; 16(4):742-755

Biography

Robert O Dillman, M.D. is Chief Medical Officer, AIVITA Biomedical Inc., Irvine, CA., and Clinical Professor of Medicine, University of California Irvine. Since 2000 his research has focused on patient-specific therapeutic cancer vaccines consisting of autologous dendritic cells loaded with tumor antigens from cultures of self-renewing autologous tumor initiating cells. He did pioneering work in biotherapy including human clinical trials with monoclonal antibodies and autologous cellular immunotherapies. For over 20 years he directed a bench-to-bedside translational cell biology laboratory specializing in patient-specific cell-based therapies. He was a principal investigator for Cancer and Leukemia Group B, Cancer Biotherapy Research Group Chairman, and a founding member and former president at the Society for Immunotherapy of Cancer (SITC). He has authored over 300 publications. He trained in Internal medicine at Baylor, and hematology/oncology at the University of California San Diego, with board certification in the above specializations. He earned M.D. from Baylor College of Medicine, and a B.A. from Stanford University.

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