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Updates on Cancer Immunotherapy with Emphasis on Innate Immune Cells

Cancer immunotherapy protocols represent the most novel exciting therapeutic modality for treating cancer. This is evident in the recent attention paid to checkpoint inhibitors for treating melanomas as well as other forms of cancer. Natural killer (NK) cells stand at the cross road among treatment of autoimmune diseases and immunodeficient diseases. We reported a new mechanism of action for the drug Copaxone (glatiramer acetate or GA; TEVA Inc.). NK cells isolated from patients dosed with GA lysed dendritic cells isolated from the same patients as well killing tumor target cells. Similarly, vitamin D3 or FTY720 (Gilenya; Novartis) augmented IL-2-activated NK cells lysis of tumor cells. Dimethyl fumarate (DMF; Biogen Inc.) is a new drug for treating multiple sclerosis patients. We have examined the effects of DMF and the metabolite monomethyl fumarate (MMF) on various activities of NK cells. We demonstrated that MMF induces resting CD56+ NK cell lysis of the NK-sensitive K562 cells and the NK-resistant RAJI cells. More recently, we observed that GA, MMF and DMF up-regulate the expression of CCR10 on the surface of activated NK cells. This is corroborated with the ability of NK cells to migrate towards the concentration gradients of CCR10 ligands, namely CCL27 and CCL28. These observations are the first to show that drugs used to treat autoimmune diseases can be used to direct the anti-tumor effector cells towards the sites of tumor growth, particularly those secreting the chemokine CCL27 such as melanomas or squamous cell carcinoma, or those secreting CCL28 such as colorectal carcinoma. Hence, drugs used to treat autoimmune diseases can be used to harness NK cells for the purpose of using them in cancer immunotherapy.

Biography

Azzam A Maghazachi received a master degree from NYU Medical School and a PhD degree in Immunology from the University of Manitoba/Canada in 1984. Between 1988-2005, he held several senior positions at various institutes and universities in the USA, Canada and Norway. In 2005, he was the director of research at Bio-Quant, Inc. in San Diego, and between 2007-2015 he was a professor of Physiology in the faculty of Medicine at the University of Oslo. Currently, he is a professor at the College of Medicine, University of Sharjah. He published more than 100 papers and book chapters and is an editor or editor-in-chief on more than 15 medical journals.

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