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Tumour-specific cytotoxic T lymphocytes: A candidate for adoptive immunotherapy of haematological malignancies

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Introduction: Due to side effects and resistance to traditional chemotherapeutic agents, new therapeutic strategies are requested for hematologic tumour management. Adoptive T cell immunotherapy represents an alternative effective, long-acting approach of minimal side effects. This study evaluates the ability of hybrid cells, generated by fusion of leukaemia tumour cells with Antigen Presenting Cells (APC) to stimulate tumour-specific cytotoxic T cells with the ability to recognise and destroy parent tumour cells.

Methods: Acute myeloid leukaemia tumour cells were fused to APC and the growth of the hybrid cells were chemically selected. The hybrid cell growth was maintained in tissue culture conditions, and subjected to phenotypic evaluation using flow cytometer. Tumour antigen expression was detected by RNA extraction followed by reverse transcription PCR using antigen specific primers. Subsequently, hybrid cells were allowed to induce T cell specific response from PBMC of normal donors. Cytotoxicity and IFN- γ ELISpot assays were performed to evaluate the functional activity of the activated T cells.

Results: The hybrid cells expressed relevant tumour antigens in context of MHC I/II, in addition to T cell co-stimulatory molecules. The immortalised hybrids induced allogeneic cellular T cell responses of both cytotoxic CD8 and CD4 types. More importantly, the induced cytotoxic CD8+ T cells successfully responded by IFN- γ release following co-culture with the target tumour cells and induce target cell apoptosis in cytotoxicity assays.

Conclusion: Hybrid cells of this type had the potential to induce specific T cell response and could be a successful immunotherapeutic, T cytotoxic cell inducer to be used for adoptive cellular management of hematologic cancers.

Biography

Yahia Saleh Mohammed, after finishing his undergraduate study of Pharmaceutical Sciences with the grade of honour, has been awarded his PhD in Infection, Immunity and Inflammation from Leicester University, UK. He served as a Lecturer of Microbiology and Immunology, Al-Azhar University, Cairo, Egypt, and he is currently an Assistant Professor of Microbiology and Immunology, University of Dammam, KSA. He has published a group of research papers in immunology and tumour pharmacology and immunotherapy in high impact journals, and he volunteer as a Reviewer/Associate Editor in a number of internationally reputed journals of the field. In addition, he is a member in many professional societies, such as American Association of Cancer Research, Saudi Society of Infectious Diseases and Microbiology, European Association of Cancer Research, British Society of Immunology, Egyptian Pharmacy Syndicate. His research interests include the malignant diseases management via cellular immunotherapy and cancer vaccines and the antimicrobial resistance patterns of Mtb.

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