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Optimizing the antigen loading of dendritic cells with exogenous peptides

ES Schultz*, D Dieckmann, B Ring and G Schuler

Address: Department of Dermatology, University Hospital, Erlangen, Germany

Email: ES Schultz* - erwin.schultz@derma.imed.uni-erlangen.de

* Corresponding author

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The central role of dendritic cells (DC) in the immune system and their unique potency to induce tumor-specific killer and helper T cells has been demonstrated in numerous studies and is today unequivocal. Therefore, DC-based immunotherapy represents one of the most promising approaches to fight cancer and since the first vaccination study in 1996 numerous trials have been performed with more than 30 DC-based vaccination trials published only in the past 3 years. In principle, antigen can be delivered to DC by various strategies, but most commonly HLA class I or II restricted peptides derived from defined tumor antigens have been used. Because peptides can be readily obtained in clinical grade quality, are easily standardized and facilitate the immuno-monitoring during clinical trials, they can still be considered as gold standard of DC antigen loading.

Nevertheless, several issues concerning the use of peptide-loaded DC still have to be addressed. In the present study we carefully analyzed different parameters such as peptide concentration, stability of HLA/peptide complexes on immature (i-DC) versus mature-DC (m-DC) or antigen competition in order to optimize the loading of DC with HLA class I and II peptides.