

Effect of Milk Proteins and their Hydrolysates on *in vitro* Immune Responses

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During the last decade, milk proteins and their enzymatically derived peptides have gained increasing attention as biologically active molecules. Previous research has established a relationship between different milk protein components and immunomodulating properties. Milk proteins seem to express both immunostimulating and immunosuppressive properties and could therefore be important for the overall regulation of immune functions in the gut.

Although different immunomodulating effects caused by various milk protein components have been observed, the mechanisms underlying these effects are not always known. In addition, most studies on the immunomodulating properties of milk protein digests have used a wide variety of commercial enzymes to simulate *in vivo* digestion. Exploring the difference in immunomodulating properties of milk protein-derived peptides produced by the aid of enzymes from human gastric secretes, compared to those produced by commercial enzymes is a novel approach that may be of great importance. It could help explore which peptides are actually produced during *in vivo* digestion of milk and how they influence the immune system.

The aim of this study was to perform a screening of various milk protein samples from both cow and goat in order to study their *in vitro* immunomodulating properties on human peripheral blood mononuclear cells. The results revealed that especially the whey protein concentrates from goat and cow showed a dose-dependent inhibition of T lymphocyte proliferation *in vitro*. The same milk protein samples also suppressed the proliferation of memory T cells, restimulated by anti-CD3 coated particles. In addition, the protein samples showed a similar dose-dependent inhibition of lymphocytes stimulated with superantigens.

A possible explanation for this inhibitory effect is suggested to be an interference with the generation of the necessary T-cell activation signals, caused by one or several milk protein-derived components. These protein components potentially inhibit the generation of co-stimulating molecules on the antigen presenting cells and their T-cell ligands, thus inhibiting the production of the T-cell activation signals required to ensure proliferation.

