Talactoferrin

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Lactoferrin is a natural globular protein with a molecular atomic mass of 80 kD. It is found in milk and many mucosal secretions such as tears and it belongs to the transferring proteins (transferrin,¹ melanotransferrin, ovotransferrin, etc.) showing a high affinity for iron (ferric state).

Talactoferrin, an orally-administered recombinant human lactoferrin, can be produced by the fungus *Aspergillus niger* var. *awamori*² and has potential antineoplastic, antibacterial and immunomodulating activities. Recombinant human lactoferrin can be produced in various plant systems (e.g., tobacco, potato, rice etc.), animal systems (transgenic mice, cows, rabbits, etc.), viruses, fungi or cell cultures,² displaying somewhat different properties according to the expression system used.

When administered topically, talactoferrin alpha binds to keratinocytes and fibroblasts and enhances the production of cytokines and key repair immunomodulatory factors such as interleukins IL-8, IL-6, macrophage inflammatory protein-1 alpha and tumor necrosis factor alpha.³

Talactoferrin also appears to have antibacterial properties and it has been recently evaluated as oral therapy in severe sepsis.^{3,5} Bovine lactoferrin has been reported to reduce the incidence of early onset sepsis when administered orally, as a supplement, either alone or with the probiotic *Lactobacillus rhamnosus* GG, in very-low birth weight premature infants (under 1500 g).^{2,6}

The effects of orally-administered talactoferrin in cancer or in sepsis⁷ are dependent on its transportation into the gut-associated lymphoid tissue (GALT), where it is responsible for recruiting and inducing the maturation of circulating immature dendritic cells bearing tumour antigens. Consequently, lymphoid effector cells induce systemic immune responses through natural killer (NK) cells and cytotoxic T lymphocytes (CTL) thus countering the local tumor-mediated immunosuppression.⁸

In conclusion, talactoferrin is an interesting antineoplastic agent which could also be useful in wound healing and, potentially in severe infections. Phase III studies are needed to clarify its potential role in severe sepsis.

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