

Power Packed Proline Peptides Restore Immune Balance

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Forty years ago in Poland, scientists isolated an unusual immune modulating substance derived from colostrum. It seemed to be potent at fighting infection, but equally potent at calming inflammation. At the time the researchers simply called it colostrinin, but after a sequence analysis of its peptides (short chains of amino acids bound by peptide bonds), they concluded that colostrinin contained at least 32 different peptides, many of which were rich in proline.

Today, proline-rich polypeptides, or PRPs, have been widely studied for their remarkably diverse immune modulating effects. Gas chromatography and mass spectrometry have helped to further define various PRPs, which can be grouped by size and molecular weight, and can be individually studied for potential immune and neurological benefits. However, then as now, researchers have found that the orchestra of peptides, all working together, seems to be the most generally beneficial. PRP-rich preparations from bovine colostrum may be modern medicine's most overlooked gem. PRPs have been shown to help combat many kinds of infections and to help autoimmune diseases such as allergies and asthma—in essence facilitating the modulating and tolerance of our immune system.

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PRPs work quite simply: by giving potent signals to the immune and neurological systems. The polypeptides do this by binding receptors on the membranes of target cells (such as immune cells). For instance, lymphocytes in the thymus gland (known as thymocytes) have PRP receptors on their membranes.[\[i\]](#) PRPs can stimulate resting B lymphocytes, which develop in the bone marrow and wait for a signal telling them to mature and circulate in the bloodstream. A PRP isolated from sheep colostrum stimulated mouse B cells to grow and differentiate. Once they have done so, B cells can start generating antibodies against visiting pathogens. Splenocytes from neonatal mice responded robustly to PRP as well.[\[ii\]](#),[\[iii\]](#)

Researchers speculate that PRPs are actually cytokines produced by the mammary gland of mammals rather than the immune system itself.[\[iv\]](#) Cytokines are a diverse family of immunomodulatory proteins and peptides. Cytokines talk to other cytokines, sending and receiving information and signals. Thus, PRPs stimulate the production of white blood cells and stimulate natural killer cells.[\[v\]](#) In one 2001 study by Polish researchers, a complex of PRPs was shown to possess immunomodulatory properties. Researchers measured cytokines such as interferon, TNF-alpha, Interleukin-6, and Interleukin-10 in human whole blood cell cultures. The PRP complex showed a bell-shaped dose-response dependence suggesting regulatory properties.[\[vi\]](#)

A PRP isolated from ovine colostrum was found to induce production of cytokines such as interferon (IFN) and tumor necrosis factor (TNF) in human leukocytes and in whole blood cultures. The effects were dose related. Many other cytokines may be stimulated also. Researchers concluded that PRPs may have therapeutic value as immunomodulatory molecules and as neurotropic cytokines, one that influences neurological function.[\[vii\]](#) In another study, PRPs stimulated interferon (IFN) and tumor necrosis factor (TNF) production by peritoneal cells from mice, by up to 30-fold.[\[viii\]](#)

A robust and effective immune response needs to be aggressive and even inflammatory in the acute phase of attack, and then quickly calm down, and soothe and heal any leftover inflammation. That's what PRPs help our immune system to do. A 2008 study of allergic responses found that PRPs isolated from mother's milk colostrum significantly decreased production of IgE/IgG1, airway eosinophilia, and mucin, and down-regulated hypersensitivity—all induced by allergenic extracts from ragweed pollen grains and house dust mites. The researchers concluded that PRPs are effective in preventing allergic responses to known indoor and outdoor allergens.[\[ix\]](#)

PRPs might also function as antioxidants. Research shows they can reduce reactive oxygen species (ROS) within cells and oxidized lipids, including the lipid peroxidation product, 4HNE, which depletes glutathione, and may lead to pathological changes at the cellular and organ level. The researchers suggest that PRPs may be useful in conditions in which ROS are implicated in pathogenesis.[\[x\]](#)

Finally, PRPs have been proven to have a beneficial impact on cognition and the brain. They function as neuro-cytokines and interesting new research demonstrates that they may help delay Alzheimer's disease.

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