

Hemocyanins as immunostimulants Hemocianinas, una herramienta inmunológica de la biomedicina actual

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Hemocyanins, the giant oxygen transporter glycoproteins of diverse mollusks, are xenogenic to the mammalian immune system and they display a remarkable immunogenicity. Therefore they are ideal non-specific immunostimulants to treat some types of cancer. They are used as an alternative therapy for superficial urinary bladder cancer (SBC), that has been traditionally treated with *Bacillus Calmette-Guèrin* (BCG). In contrast to BCG, hemocyanins do not cause side-effects, making them ideal for long-term repetitive treatments. Hemocyanins have also been exploited as carriers to develop antibodies against hapten molecules and peptides, as carrier-adjuvants for cutting-edge vaccines against cancer, drug addiction, and infectious diseases and in the diagnosis of parasitic diseases, such as Schistosomiasis. The hemocyanin from *Megathura crenulata*, also known as keyhole limpet hemocyanin (KLH), has been used for over thirty years for the purposes described above. More recently, hemocyanin from th