

# Stellar Biotechnologies has discovered a humble mollusc, which helps to cure cancer and addiction

✘ In the Mexico's Pacific coast and in California, there exists a mollusc called Giant Keyhole Limpet. Its 'blood', or hemolymph, is rich in a protein that can be used as the base ingredient in a vaccine to fight breast cancer. The ingredient is known as Keyhole Limpet Hemocyanin or simply KLH and it is a protein which facilitates the creation of haptens (peptide, polysaccharide) carrying oxygen, essentially, through the limpet's blood. Stellar Biotechnologies ('Stellar', TSXV: KLH | OTCQB: SBT0F) is the world's specialist in the field of KLH protein and immunotherapy, one of the fastest growing sectors of the biopharma industry.

Unlike some synthetic alternatives, KLH is nontoxic. Stellar has developed a clean and environmentally safe method to raise limpets in an aquaculture business park next to the Pacific Ocean in Port Hueneme, California. Stellar has a unique production facility capable of supplying GMP (Good Manufacturing Practices) grade proteins based on aquaculture at a sustainable rate. GMP's mean that the proteins are manufactured in our ISO-certified facilities in full compliance with all relevant guidelines.

Taiwan based biotech firm Amaran Biotechnology Inc (privately held) entered into a cooperation agreement with Stellar last December "to develop and evaluate methods for the manufacture of OBI-822 active immunotherapy using Stellar's GMP grade Keyhole Limpet Hemocyanin". OBI-822 is Amaran's own active immunotherapy agent combining Globo-H, a carbohydrate antigen typical of cancer cells with KLH, used as the immune-

stimulation carrier molecule. Clinical trials suggest that OBI-822 could be more effective than any of the currently available cancer therapies with the advantage that the product avoids the harm linked with chemotherapy. The therapy, therefore, offers far better 'quality of life' for the patient.

Haptens are immunogens, that is to say they help to induce an adequate immune response. Haptens are often weakly immunogenic, that is to say they show little ability to induce an efficient immune response by not allowing the body to produce antibodies in sufficient amounts to protect it. In order for the haptens to become immunogenic – more effective in layman's terms – they can be coupled with a larger molecule: the carrier protein. The carrier helps to transport the antigenic fraction of the bacteria, promoting a more lasting response. The carrier and the antigen, together, form what is known as a conjugate vaccine. Therefore, companies involved in the development of KLH such as Stellar are engaged in a very high demand area of immunology research.

The protein stimulates the body's production of antibodies, provoking a powerful immune response. KLH achieves similar goals to synthetic drugs; expect that because of its completely natural origin, it is non-invasive and non-toxic, which makes it far more desirable and effective. The KLH targets the body's own tolerance of cancer cells, breaking it down in order to provoke a rejection. The same notion can be applied to other cases where the body shows excessive tolerance toward harmful invaders. Addiction is one of these and KLH has a strong potential in that sector. Scripps Research Institute in California is using KLH in a vaccine that eliminates the ecstatic effects of heroin. The KLH, in lab experiments using rats, eliminated the 'high' immunizing the subject against it, thereby breaking the addiction. The experiments could lead to the advancement of drugs to target any number of addictions from drugs to alcohol and smoking.

Stellar happens to be one of the world leaders in the production of KLH, which can also be used to assess immune response in inflammatory diseases, skin diseases, Alzheimer's, and immune disorders.

Recently, Stellar's stock has fallen by as much as 40% from the CAD\$ 1.70/share at the end of last March to CAD\$ 1.00/share range last week. However, there was no news to justify the drop; indeed, Stellar's stock was actually recommended because of the unique production facilities; indeed, the company is well funded and it is not expected to be raising cash. The fundamentals – that is the unique position that Stellar occupied in the KLH 'space' – have not changed at all and should be drawing interest. One of the main reasons is that Stellar owns the patent to extract KLH from the limpet as well as the technology to farm the limpets in an environmentally sustainable manner, which reduces risk to the final product and to investors.

Stellar did a private placement at USD\$ 1.05/share in August of 2013 and has USD\$ 15 million in cash. Essentially, there is nothing to explain the recent drop other than the fact that the stock reflects the very volatile biotech sector. The IBB, which is a composite index for all the biotech majors, fell off the proverbial cliff starting in early March and it may well be that KLH's drop is a 'reflux' of this pattern. Stellar also has an advantage in the fact that its KLH is manufactured using non-lethal ingredients while offering high potency; it also has a wide variety of applications. Moreover, Stellar has little competition. Only two other companies manufacture similar products and in both cases they are specialized, lacking Stellar's wider range of applications.

(Image Source: Flickr)