



**The Chinese University of Hong Kong**  
**Non-confidential Abstract of Technology Disclosure**

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**Title: Preparation of Selenium-containing Phycocyanin Peptides with Antioxidant and Anticancer Activities**

**CUHK Ref. No.:** 09/SCI/324

**Inventor(s):** Professor Yum Shing WONG, Department of Biology

**Patent Status:** Chinese Patent Application Pending

**Licensing Status:** Available for licensing

**Non-confidential abstract:**

Cancer is a growing global health problem. According to the American Cancer Society, 7.6 million people died from cancer in the world during 2007. Selenium (Se) is an essential micronutrient important to human health. Many epidemiological studies, preclinical investigations and clinical intervention trials support the role of Se compounds as potent cancer chemopreventive agents. Se supplementation was found effective in reducing the incidence of cancers. Studies also showed that the chemical form and the dose are determinants of anticancer activities of Se compounds. The search for novel Se compounds that are more effective in cancer chemoprevention receives much attention in recent years.

*Spirulina platensis*, a blue-green microalga, is widely used as a nutritional supplement as well as in therapeutic applications due to its high contents of proteins, polyunsaturated fatty acids, provitamins and other nutritional elements. Our previous works demonstrated that *Spirulina* was a good candidate for Se enrichment and the Se-enriched *Spirulina* was a promising source for dietary Se supplementation. *Spirulina* is rich in phycocyanin (PC), a photosynthetic pigment protein that has been described as a natural agent with antioxidant, anti-inflammatory, antiviral, cardio-protective and anticarcinogenic activities. Se-containing phycocyanin (Se-PC) is a novel Se compound first purified by us from Se-enriched *Spirulina* cells. Our previous studies showed that Se-PC exhibited novel in vitro antioxidant and anticancer activities, which were significantly higher than those of PC. Moreover, protease digestion product of Se-PC significantly enhanced its in vitro anticancer and antioxidant activities. These findings indicate the chemopreventive potential of Se-PC and its digested peptides. However, the purification and identification of Se-PC bioactive peptides, and development of them as chemopreventive and antioxidative agents needs further evaluation.

A new, cost-effective and environment-safe method to prepare and purify bioactive peptides from Se-PC by protease digestion has been developed. Only minor modification is needed for existing bioactive peptides plants to adopt the new method.

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