

# Preparation of anti-tumor nanoparticles using tiger milk mushroom

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A polysaccharide-protein complex was found in Tiger Milk mushrooms from Africa, which can turn selenium into new cancer treatment. Copyright : Hong Kong Polytechnic University

Tapping into the power of natural ingredients for safer treatment is the next frontier in the battle against cancer. A recent breakthrough from Hong Kong Polytechnic University uses tiger milk mushroom to prepare anti-tumor nanoparticles is bringing us one step closer.

Cancer is a word dreaded by many. Many cancers are deadly and difficult to treat while conventional remedies such as [chemotherapy](#)

often cause physical and emotional side effects, giving struggling patients more harm just as the cancer. What if cancer-killing drugs can become more natural and in harmony with our body? Tapping into the power of natural ingredients for safer treatment is the next frontier in the battle against cancer. A recent breakthrough from PolyU's Department of Applied Biology and Chemical Technology using tiger milk mushroom to prepare anti-[tumor nanoparticles](#) is bringing us one step closer.

A natural compound found in mushrooms may hold the key to a new class of cancer drugs. In Tiger Milk mushrooms from Africa, Dr Wong Ka-hing, Associate Director of the Food Safety and Technology Research Centre, has discovered a polysaccharide-protein complex (PSP) which can turn selenium, a common nutrient, into new cancer therapy to benefit millions of breast cancer patients around the world.

Selenium is a trace mineral essential for good health. Health benefits include boosting immune systems against viral infections. Staple foods and vegetables in our diet such as rice, wheat, potatoes, broccolis and onions are great sources of antioxidant. In nano-size, selenium was found to have potent anti-cancer effect in the laboratory. However, efficacy diminished as the nanoparticles fell back into bigger aggregates which suppressed the up-take into cancer cells. Finding new ways or compounds to halt the rebinding process is harder than it seems. Literally, it is quite like searching for a needle in a haystack.

The use of mushroom PSP as stabilizing force is a significant breakthrough. Combined with cutting-edge nanotechnology, Dr Wong and his team successfully made selenium nanoparticles to destroy breast cancer cells. "Lab-test results were exciting. Our selenium nanoparticles were found to have remarkable inhibition effect on the growth of human breast cancer cells by triggering the cells into self-destruction. The next stage will be tests on animals," Dr Wong said.

The research is still in a very early phase. But if successful, it could lead to a new drug much less toxic and more reliable, capable of killing [cancer cells](#) while leaving healthy tissues unharmed, which could mean fewer agonizing side-effects, greater comfort and better chances of recovery. Dr Wong also planned on developing a dietary supplement as auxiliary cancer treatments.

Scientists around the world have been looking into the therapeutic value of produces such as fish oil, broccoli, cauliflower, cabbage, and green tea. For safe human consumption, a natural ingredient must be effective against cancer in low concentration. Dr Wong's work has advanced medicine with a working tool for boosting the effectiveness of natural cancer killing compounds.

“Mushroom PSP has striking effects on controlling selenium nanoparticles,” Dr. Wong added, “and a better understanding of this mechanism may help us find the next suitable compounds and make better nano-medicines for a whole host of cancers.” Tiger Milk, similar to Chinese [mushrooms](#) we have in dishes and soups mushroom, is a common foodstuff in Africa, and the groundbreaking biomedical research opens door to making cancer drug from 100% [natural ingredients](#). The [drug](#) development process is equally natural and green because all it takes are room temperature and water, which is little waste and without much power consumption.

Holding new promise for beating [cancer](#), this research has won Dr Wong the Young Investigator Award at the 2011 International Conference of Food Factors and the Gold Medal in 40th International Exhibition of Inventions of Geneva. These prestigious awards were at the same time an endorsement to the long-running commitment from the University to the discovery and development of ingredients for the betterment of the community.

Provided by Hong Kong Polytechnic University

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