

## Mini Review

# New Directions in Cancer Therapy – Peptide Targeting Therapy

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About 10% of the world's population each year is dying of cancer; if appropriate treatment is improved, it may delay and reduce this situation. From 60 to 70 years ago, the way to treat cancer, chemotherapy, is chemotherapy using a strong toxic drug, such as Endoxan (or doxorubicin) or other chemotherapy drugs to treat cancer patients. Due to the strong side effects of these anticancer drugs, after a few weeks of treatment, the patient is often subjected to great pain and even needs to stop taking the drug immediately.

Although many people have come up with alternative treatments such as interferon or interleukin-2 (IL-2) to treat a small number of tumors, such treatments also have strong side effects. Later, there was a so-called "cancer immunotherapy", which is only 20 to 30% efficient, not only expensive, but also often accompanied by lethal side effects. In order to avoid side effects, the author team proposed another type of cancer therapy, which hopes to inhibit and kill cancer cells without causing damage to normal cells. In the process, the team designed a peptide length consisting of 12 amino acids, using a peptide library presented by phage to screen out specific peptides; this peptide can be used without binding to normal cell membranes. It binds to the cancer cell membrane. According to this method, the team first identified a peptide sequence, L-peptide, whose C-terminus binds to more than 8 cancer cells, but does not bind to normal cells [1, 2].

Not only that, but the team also covalently bonded the N-terminus of the L-peptide to the liposome containing the chemotherapeutic drug, and the other end of the L-peptide was still able to adhere to the cancer cell membrane. Through this action, chemotherapy drugs can be brought into cancer cells to kill cancer cells. Immediately afterwards, the team continued to use the phage to displayed random peptide library, and successively identified "SP94 peptide" and "PC5-59 peptide", which can bind to the cancer cell membrane and the microvascular cell membrane in the tumor. After confirming its ability to bind to various cancer cell lines, the team has further experimented with peptide-targeted therapy, which has been shown to inhibit tumor growth and reduce the side effects of chemotherapy drugs [3].

Dr. Wu Hang-chung, Dr. LeeTong-Yound and Dr. Zhang Dekuan continued their efforts in the laboratory of the author team and several other graduates who graduated from the laboratory. The peptide biomarker research has achieved 13 international patents. With a very

high evaluation; from the beginning of the research, the laboratory has accepted more than 35 cancer associations and research institutes from all over the world to give a speech. Only time is limited, and finally only choose Soviet Russia, Japan, China, Taiwan Pathology Medical Association, Singapore, Italy, the Czech Republic and the United States to communicate. Among them, 60% of the invited units arranged for the author to be the keynote speaker of the seminar.

Currently, Dr. Wu Hang-chung, a researcher at the Academia Sinica, is dedicated to the research of cancer and infectious diseases. In the research of dengue virus, he has successfully developed four in vitro detection kits that identify four dengue virus antibodies and have high sensitivity and specificity. The reagent is more effective than the currently available fast screening reagents; and its immunotarget anticancer drug delivery system research has great clinical potential, not only breaks through the bottleneck currently facing cancer treatment, but its innovation research has also led internationally. Among the research results, there are 13 technical licenses (including 36 patents) for the biotechnology industry, and the total transfer amount of technology transfer exceeds NT\$250 million, which is expected to become one of the important future research and development achievements of the country.

## References

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