

Peptide-Targeted Chemotherapy against Breast Cancer

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To obtain a better efficacy of chemotherapy we used one nasopharyngeal carcinoma (NPC) line to select a 12-mer specific peptide which can bind specifically to the surface of NPC cells from a phage-displayed random peptide library. This peptide has met several criteria for targeted drug delivery into the NPC solid tumor. In vitro the peptide can bind specifically to the cell surfaces of most NPC cell lines and biopsy specimens; the peptide-linked liposome containing fluorescent substance is capable of binding to and translocation across cell membranes; in vivo, this specific peptide can bind and accumulate in the NPC xenograft in SCID mice, but not in normal organs; similarly, the peptide-linked liposome carried doxorubicin (Dox) not only can cause marked cytotoxicity of NPC cells in vitro, it can also suppress markedly the xenograft growth in SCID mice without systemic side effect. In addition, FITC-labeled L-peptide could also bind to breast cancer cells by FACScan. In MDA-231 breast cancer xenografts, L-peptide-labeled Dox could inhibit not only the in situ xenograft but also the metastatic tumor nodules with minimal adverse effect. The L-peptide linked iron oxide (Fe₃O₄) nanoparticles could be localized in MDA-231 cultured cells and on the breast cancer surgical specimens. In conclusion, the novel peptide we identified can be used for targeted chemotherapy with high efficacy and without systemic side effect. Apparently, the peptide-targeted chemotherapy is superior than the conventional chemotherapy, and application of this peptide-targeted therapy against breast cancer may let this cancer becomes a controllable disease.

Biography

Dr. Chin-Tarng Lin was awarded his D.D.S. degree from National Taiwan University (NTU), Taipei, Taiwan in 1963 and obtained his Ph. D. degree in 1975 from the Graduate Institute of Texas Medical Branch at Galveston, Texas, U.S.A. He was a Professor in the Institute and Department of Pathology, NTU since 1987 and became an Emeritus Professor in 2009. He has established 10 nasopharyngeal carcinoma (NPC) cell lines, and developed the peptide-targeted chemotherapy method against cancers. He has published more than 87 papers in reputed journals. The published data strongly indicate that peptide-targeted chemotherapy has a great potential for cancer treatment.