

Early Diagnosis and Treatment of Cancer Using Synthetic Cationic Peptide

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Abstract : Cancer is one of the prime causes of early death worldwide. Mutation of the gene involve in DNA repair and damage, like BRCA2 (Breast cancer gene two) genes, can be detected efficiently by PCR-RFLP to early breast cancer diagnosis and adopt the suitable method of treatment. Host Defense Peptide can be used as blueprint for the design and synthesis of novel anticancer drugs to avoid the side effect of conventional chemotherapy and chemo resistance. The change at nucleotide position 392 of a -> c in the cancer sample of dog mammary tumour at BRCA2 (exon 7) gene lead the creation of a new restriction site for SsiI restriction enzyme. This SNP may be a marker for detection of canine mammary tumour. Support vector machine (SVM) algorithm was used to design and predict the anticancer peptide from the mature functional peptide. MTT assay of MCF-7 cell line after 48 hours of post treatment showed an increase in the number of rounded cells when compared with untreated control cells. The ability of the synthesized peptide to induce apoptosis in MCF-7 cells was further investigated by staining the cells with the fluorescent dye Hoechst stain solution, which allows the evaluation of the nuclear morphology. Numerous cells with dense, pyknotic nuclei (the brighter fluorescence) were observed in treated but not in control MCF-7 cells when viewed using an inverted phase-contrast microscope. Thus, PCR-RFLP is one of the attractive approach for early diagnosis, and synthetic cationic peptide can be used for the treatment of canine mammary tumour.

Keywords : cancer, cationic peptide, host defense peptides, Breast cancer genes

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