Talk

Identification of novel bioactive peptides

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ABSTRACT

Motivation: Targeting agents are the most commonly used strategies in therapeutics and diagnostic treatment.They can be classified in two main classes: chemicals and biologicals. Chemicals (farmaceutics and related) have been used for years, but nowadays biologicals experience an increasing demand because of their potentially higher specificity and affinity. Bioactive peptides from rational design can act as targeting agents that specifically interact with, and mostly inhibit, a biomolecule of interest (Seignauric et al., 2011).

Methods: We have built a large library of peptides, and are screening for those that have biological activity, specially related to cell proliferation inhibition. The initial inconvenience is that small peptides cannot be expressed from single transcription unit as larger proteins, as they will be destroyed by cell proteases system. It is necessary to include the peptide library into a protein scaffold. We have designed a novel structure that includes the variable peptide sequence from the library between two mini-domains "EFLIVIKS" (one letter aminoacid code) able to form a noncovalent loop (Gururaja et al., 2010). In one of our constructs we have included a T7 promoter to allow conditional expression in bacteria. For its expression, we have designed two large nucleotide sequences (79 and 124 nucleotides, the large one includes the variable peptide sequence) that assemble by 20 complementary nucleotides in their 3' ends. By polymerization, both oligos strings are filled and form a two-chain structure, that will be inserted in a expression vector to obtain our peptide library. We transform bacteria (E. coli) and yeast (Schizosaccharomyces pombe) in order to identify those colonies excpressing the bioactive peptides that kill the cells or interrupt cell cycle.

REFERENCES

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