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Synthesis and characterization of X-aptamers against growth hormone eleasing hormone (1-29) peptide and investigate their apoptotic effect on PC3, HT29 and MIA PaCa-2 cells

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Abstract

Growth Hormone Releasing Hormone (GHRH), 44 amino acid containing hypothalamic hormone, retained its biological activity by first 29 amino acids

1. GHRH (NH2 1-29) peptide antagonists inhibits growth of prostate, breast, ovarian, renal, gastric, pancreatic cancer in vitro and in vivo

2. Aptamers, single-strand RNA or DNA oligonucleotides are capable of binding against target molecules with high affinity

3. Our aim in this study is to synthesize and select aptamers against GHRH (1-29) peptide and demonstrate synthesized aptamers' inhibitive effect on PC3, HT29 and MIA PaCa-2 cells. Aptamers against GHRH (NH2 1-29) peptides were synthesized by X-aptamer selection kit after biotinylating of target protein. Binding affinity (Kd) of GHRH (NH2 1-29) X-aptamers were determined by dot-blot method. Binding of aptamers against GHRH and its receptor and blocking of GHRH signaling was determined by GH, GHRH-R immunofluorescence assay. Dose- and time-dependent effect of X-aptamers on cell viability, mitochondrial membrane potential, apoptotic effects on PC3, HT29, MIA PaCa-2 cells were determined by MTT cell viability assay, DiOC6, DAPI, PI staining, and Annexin V/PI.

FACS flow analysis, respectively. Binding affinity of two of five putative GHRH (1-29) X-aptamers were by 1.8-fold, TKY.T2.08 and TKY.T2.09 X-aptamers have significant suppression on GH, GHRHR expression without any alteration in intracellular Ca+2 and cAMP levels in HT29, MIA PaCa-2 cells. 500 nM TKY.T2.08/TKY.T2.09 X-aptamer decreased cell viability loss by 16/22 %, 41/20%, 22/10% in PC3, HT29 and MIA PaCa-2 cells for 72 h, respectively. TKY.T2.08/ TKY.T2.09 Xaptamer induced subG1 population accumulation by 5.4/4.5%, 3.7/4.7%, 24/14.7% in PC3, HT29 and MIA PaCa-2 cells for 72 h, respectively. In conclusion, two selected GHRH (1-29) X-aptamer triggered cell viability loss and induced apoptotic cell death in PC3, HT29, MIA PaCa-2 cells via suppressing the expression of GH and GHRH-R. The project was funded by TUBİTAK-1001 National Scientific Research

Biography:

Zeynep Elif Apaydın was born in 1993 in Samsun, Turkey. When she was a student in high school, she decided to study molecular biology and genetics. She has started to study in T.C. İstanbul Kültür University and moved to İstanbul in 2012. She currently pursues a master's degree at İstanbul Kültür University and continues her studies on cancer research. She has given 2 poster presentations in international congresses related to her research. She is planning to continue her work on academical field after graduation from master's programme

Speaker Publications:

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