THE PAIRING OF VEGETABLE AND WITH 5-FLUOROURACIL

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Currently, within oncological diseases chemotherapy there are used a broad spectrum of anticancer preparations, which if used extensively in chemotherapy procedures, can effect and cause serious side effects and phenomena such as MDR, multidrug resistance. In the past 10 years, new models of chemotherapy courses are developing, which could possess cancer cell specificity and destroy the phenomenon of MDR. One of the main perspectives is the development of nanoconjugated vectored systems. [1]

In this context, the DNA isolation was performed from soybean plant, then there was conjugated with anti-cancer preparation 5-Fluorouracil. The DNA isolation was performed following the Vallejos protocol [2], while 5-Fluorouracil was given by PMSI Chisinau Oncological Institute from the Republic of Modova.

The coupling of vegetable soybean DNA with 5-Fluorouracil was performed under mild conditions of +25 ^{0}C. DNA 2%, following a reversible thermal denaturation under the temperature of +86.6 ^{0}C for 10 min, then it was treated with a solution of 5-Fluorouracil 2.5%, pH 7.5. (the sol. of 5-Fluorouracil being previously heated to +50 ^{0}C in order to avoid immediate cooling). The resulting solution is centrifuged for 15 minutes at 5000 r.p.m. It is kept in the dark before the registration of the UV-Vis spectra.

Studying the UV-Vis absorption spectra, one can say that the formation of DNA-Fluorouracil complex was achieved, under the principle of the hydrogen bonds (most probably), between the hydrogen atom of the oncostatic agent and the nitrogenous bases of the DNA molecule, the process developing at the moment of the reverse distortion of the secondary structure of the extracted DNA.

Conclusions:

1. DNA isolation was performed from soya plant, following the Vallejos protocol, the resulting product being confirmed by the electrophoresis process.
2. The DNA-5-Fluorouracil complex was achieved, the chemotherapeutic agent molecule being coupled by means of hydrogen bonds, a combination which confirms the great potential of DNA as a polymer for vectored structures of transport, due to the very simple process for obtaining it.
3. The UV-Vis spectra confirmed the obtained compound by the appearance of two bands in the DNA-5-Fluorouracil spectrum, which are located between 210-225 nm and 295-325 nm

References:

1. Benjamin P. Duckworth, Yan Chen, James W. Wollack *„A Universal Method for the Preparation of Covalent Protein–DNAConjugates for Use in Creating Protein Nanostructures”*, Wiley-VCH Verlag, Weinheim 2007, pag 2-8
2. Michele K. Nishiguchi, Phaedra Doukakis, Mary Egan *„DNA Isolation Procedures”* 2012, Queen’s University, pag. 262-265