The radio frequency systems to potentate the therapeutic properties of nanostructures and nanosystems as carriers into the cell.

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Introduction

The purpose of the study was to use viabilised nanostructures, as carriers for delivery of different drugs or structures into the cells using different methods (injected intratumoral or send via blood flow) in cancer treatment.

To use SWNT as „carrier" several properties and features have to be demonstrated. Among them the demonstration that thermal effects on the indicated viabilised nanostructure has effects only on the structure sent and the combination between SWNT and viabilisation will be not affected by SWNT

Material and methods

Our study was designed for some specific structures knowkn to be used as carriers for several nucleic acids sequences or different drugs, like SWNT originally produced in ITIM Laboratories in Cluj Napoca.

Knowing that in hyperthermia, the targeted temperature range is between 40 and 46ºC, we demonstrated that at that temperature, the SWNT structure is not affected.

The experiments were carried out in ICECHIM Bucharest Laboratories, Romania on nanotubes produced by TIM Cluj and also from Bucharest.

The experiment was made on TGA / SDTA 851E Mettler-Toledo., which is evaluating the weight loss with the temperature of the tested materials. The same thermal effect is produced by a Radiofrequency Generator (the device was built in Cluj, generating 400-500 W in a range of 2-30 MHz (range including the frequency allocated to medical purposes).

The results are demostrating that SWNT are ideals transporters, due to a remarcable thermal conductivity and thermal resistance.

Conclusion

The experiments on SWNT structures were carried out to evaluate several properties and parameters :

- Radiation power
- Radiation frequency
- Radiation time
- Thermal effects of the radiation in different tissues, under different angles

Our results demonstrates that under certain conditions these type of transporters can be used under the precise control of a radio frequency generator with better results in targeting the cell membrane, being potential candidates for cancer treatment.