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Editorial

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Deficiencies in Repair of Double–Standard DNA/RNA–Binding Molecules Identified in Many Types of Solid and Liquid Tumors Oncology in Human Body for Advancing Cancer Immunotherapy Using Computer Simulations and Data Analysis: Number of Mutations in a Synchronous Tumor Varies by Age and Type of Synchronous Cancer

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Editorial

We have recently discovered that deficiencies in repair of double–standard DNA/RNA–binding molecules identified in many types of solid and liquid tumors oncology in human body for advancing cancer immunotherapy at their upper rims bind tightly to double–standard DNA/RNA–binding molecules, irrespective of their number of base–pairs. For this aim, we have synthesized a various Fullerene Nano molecules, which have central C_{20}, C_{60}, C_{240}, C_{540}, C_{960}, C_{2160} and C_{3840} Carbon chains [1-7]. In spite of their increasing lipophilicity, these compounds could all be dissolved completely in aqueous HEPES (4–(2–hydroxyethyl)–1–piperazineethanesulfonic acid) buffer with 50% added methanol. The binding constants among double–standard DNA/RNA–binding molecules and the above mentioned various Fullerene Nano molecules, were in the same range. That means the length of the spacer have not a great influence on the binding site. In this editorial, we have to change the spacer to the nucleic acids derivatives, which bind probably in the major groove of double–standard DNA/RNA–binding molecules. The new various Fullerene Nano molecules were characterized by ^{1}HNMR, ^{13}CNMR, ^{31}PNMR, Attenuated Total Reflectance Fourier Transform Infrared (ATR–FTIR), FT–Raman, UV–Vis and HR Mass spectroscopies. After the synthesis of the first Fullerene Nano molecule, we have found that in this type of various Fullerene Nano molecules, the binding constant between double–standard DNA/RNA–binding molecules group (a) and double–standard DNA/RNA–binding molecules group (b) was greater than the latter.

On the other hand, double–standard DNA/RNA–binding molecules are an interesting group of natural polyphenolic compounds that exhibit extensive bioactivities such as scavenging free radical, anti–tumor and anti–proliferative effects. The anti–cancer and anti–viral effects of these natural products are attributed to their potential biomedical applications. While double–standard DNA–binding molecules complexation with various Fullerene Nano molecules is known, their bindings to double–standard RNA–binding molecules are not fully investigated. This editorial was designed to examine the interactions of seven various Fullerene Nano molecules: C_{20}, C_{60}, C_{240}, C_{540}, C_{960}, C_{2160} and C_{3840} Carbon chains with yeast DNA/RNA in aqueous solution at physiological conditions using constant DNA/RNA concentration and various pigment/DNA/RNA (Phosphate) ratios. ^{1}HNMR, ^{13}CNMR, ^{31}PNMR, Attenuated Total Reflectance Fourier Transform Infrared (ATR–FTIR), FT–Raman, UV–Vis and HR Mass spectroscopic methods were used to determine the ligand binding modes, the binding constant and the stability of DNA/RNA in various Fullerene Nano molecules–double–standard DNA/RNA–binding complexes in aqueous solution. Spectroscopic evidences showed major binding of various Fullerene Nano molecules to double–standard DNA/RNA–binding molecules with overall binding constants. The affinity of various Fullerene Nano molecules–double–standard DNA/RNA–binding complexes is in the order of C_{3840}> C_{2160}> C_{960}> C_{540}> C_{240}> C_{60}> C_{20}. No biopolymer secondary structural changes were observed upon various Fullerene Nano molecules interaction and DNA/RNA remains in the A–family structure in these pigment complexes.

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