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Study of the Role of Anti–Cancer Molecules with Different Sizes for Decreasing Corresponding Bulk Tumor Multiple Organs or Tissues

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Commentary

The intermolecular forces between anti–cancer molecules such as Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin, Dicycloplatin, Eleutherobin, Epothilone B, Discodermolide and Taxol **(Figures 1** and **2)** and tumor multiple organs or tissues are of great importance in many areas of science including medicine, chemotherapy, pharmacology, medicinal chemistry, pharmaceutical chemistry, biochemistry and so on [1–21]. As a result, these molecular systems have received a great significant of attention in both computational and theoretical aspects [22–32]. In this commentary, all calculations are carried out by Gaussian 09. Geometry optimization for each molecule are be fulfilled at HF, PM3, MM2, MM3, AM1, MP2, MP3, MP4, CCSD, CCSD(T), LDA, BVWN, BLYP and B3LYP computational methods with 31G, 6–31G*, 6–31+G*, 6–31G(3df, 3pd), 6–311G, 6–311G* and 6–311+G* basis sets, respectively. It should be noted that calculations are accomplished at 298 K and 0 K at HF, PM3, MM2, MM3, AM1, MP2, MP3, MP4, CCSD, CCSD(T), LDA, BVWN, BLYP and B3LYP computational methods with 31G, 6–31G*, 6–31+G*, 6–31G(3df, 3pd), 6–311G, 6–311G* and 6–311+G* basis sets, respectively. Also, the spectroscopic, structural and thermodynamic properties were investigated.

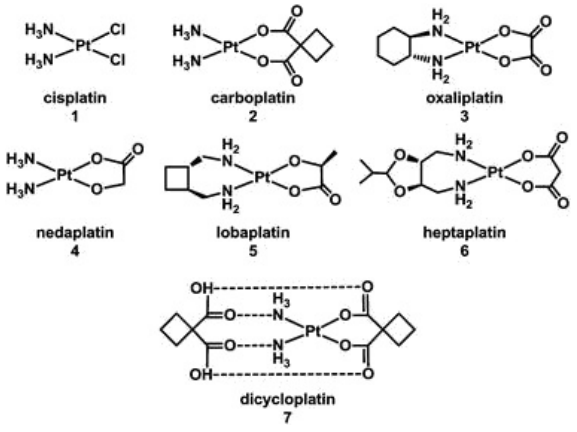

Figure 1 Molecular structures of Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin and Dicycloplatin anti–cancer molecules.

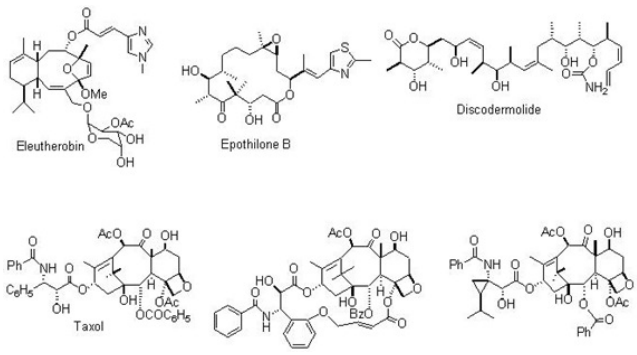

Figure 2 Molecular structures of Eleutherobin, Epothilone B, Discodermolide and Taxol anti–cancer molecules.

On the other hand, chemical behavior of Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin, Dicycloplatin, Eleutherobin, Epothilone B, Discodermolide and Taxol as anti–cancer molecules has been investigated very extensively because of their importance in chemical and biological systems. Furthermore, study of Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin, Dicycloplatin, Eleutherobin, Epothilone B, Discodermolide and Taxol as anti–cancer molecules with different sizes can help to understand how anti–cancer molecules bulk limit as the tumor size decreases. Due to the complexity of the interaction of Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin, Dicycloplatin, Eleutherobin, Epothilone B, Discodermolide and Taxol as anti–cancer molecules which is dominated by the Hydrogen bonding, the chemical structures of Cisplatin, Carboplatin, Oxaliplatin, Nedaplatin, Lobaplatin, Heptaplatin, Dicycloplatin, Eleutherobin, Epothilone B, Discodermolide and Taxol as anti–cancer molecules are complex and difficult. In this commentary, all calculations are carried out by Gaussian 09. Geometry optimization for each anti–cancer molecule is carried out at HF, PM3, MM2, MM3, AM1, MP2, MP3, MP4, CCSD, CCSD(T), LDA, BVWN, BLYP and B3LYP computational methods with 31G, 6–31G*, 6–31+G*, 6–31G(3df, 3pd), 6–311G, 6–311G* and 6–311+G* basis sets, respectively. In addition, calculations are accomplished at 298K and 0K at HF, PM3, MM2, MM3, AM1, MP2, MP3, MP4, CCSD, CCSD(T), LDA, BVWN, BLYP and B3LYP computational

methods with 31G, 6–31G*, 6–31+G*, 6–31G(3df, 3pd), 6–311G, 6–311G* and 6–311+G* basis sets, respectively. Moreover, the spectroscopic, structural and thermodynamic properties were studied.

Furthermore, Cadmium Oxide (CdO) nanoparticles are used as anti–cancer Nano drugs. They make a strong complex with DNA/RNA of human cancer cells which in human metabolism complexes have vital role. Each Nano compound or Nano material that perturbs the structure and normal reactivity of a vital complex is named a position. A position is either a strong ligand which makes a complex with DNA/RNA of human cancer cells and/or a metal which can react with vital ligands. In medicinal, pharmaceutical, clinical and biochemical approaches, a strong DNA/RNA of human cancer cells ligand applies to remove the metal position. Theoretically, computationally and experimentally, as much a complex is more stable its anti–cancer properties should be stronger. This stability depends on conformational stability of DNA/RNA of human cancer cells ligands. Based on these principles, we have introduced some anti–cancer Nano drugs such as Cadmium Oxide (CdO) nanoparticles and consider their stability energies in complex making with DNA/RNA of human cancer cells. Our results showed that some nanoparticles such as Cadmium Oxide (CdO) nanoparticles could be theoretically, computationally and experimentally used as anti–cancer Nano drugs. We have also reported their preparation procedure and we have studied the role of stereochemistry in these anti–cancer Nano drugs. By these types of calculations, we have also introduced some nucleic acids complexes as good anti–cancer Nano drugs using Gaussian 09 at HF, PM3, MM2, MM3, AM1, MP2, MP3, MP4, CCSD, CCSD(T), LDA, BVWN, BLYP and B3LYP computational methods with 31G, 6–31G*, 6–31+G*, 6–31G(3df, 3pd), 6–311G, 6–311G* and 6–311+G* basis sets, respectively. In this commentary, we would like to extend our studies about stereochemistry of some roles of anti–cancer molecules with different sizes for decreasing corresponding bulk tumor multiple organs or tissues.

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