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Elimination of Cancer Cells Using Thin Layers of Cadmium Oxide (CdO)-DNA/RNA Sandwiched Complex Composite Plasmonic Nanostructure under Synchrotron Radiation

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Abstract

Triptycene Barrelene Anthracene (TBA) is a polycyclic aromatic hydrocarbon consisting of three benzene rings. The name TBA is a composite of phenyl and TBA. In its pure form, it is found in cigarette smoke and is a known irritant, photo-sensitizing skin and industrial carcinogenic wastewater. Cadmium Oxide (CdO) is an inorganic compound with the formula CdO. It is one of the main precursors to other cadmium compounds. It crystallizes in a cubic rocksalt lattice like sodium chloride, with octahedral cation and anion centers. It occurs naturally as the rare mineral monteponite. CdO can be found as a colorless amorphous powder or as brown or red crystals. CdO is an n-type semiconductor with a band gap of 2.18 eV (2.31 eV) at room temperature (298 K). DNA/RNA, CdO and DNA/RNA-CdO sandwiched complex were characterized by Attenuated Total Reflection-Fourier Transform-Infrared (ATR-FTIR) spectroscopy, Raman spectroscopy, X-Ray Diffraction (XRD) technique and Energy-Dispersive X-Ray (EDAX) spectroscopy. The modified anti-cancer protective membrane was characterized by Scanning Electron Microscope (SEM), EDAX analysis, 3D-Atomic-Force Microscopy (3D-AFM), Transmission Electron Microscopy (TEM) and contact angle analyses and methods. The current study is aimed to use Polysorbate 80 as surfactant for investigating the effectiveness of permeate TBA on the Polyether Ether Ketone (PEEK) anti-cancer protective membrane and the effect of loading DNA/RNA-CdO sandwiched complex on hydrophilicity and anti-cancer properties. The results showed decreasing surface pore size from 227 to 176 and increasing porosity from 101 to 111 with loading DNA/RNA-CdO sandwiched complex, and the permeate of anti-cancer protective membrane increased from 80 to 220 (L/m2.hr.bar) with loading DNA/RNA-CdO sandwiched complex. In addition, the results of current study showed that by increasing DNA/RNA-CdO sandwiched complex nanohybrides to 0.09 Wt% to polymer matrix contact angle decreased from 84.4 to 23 degree. Moreover, the results of current study showed that by increasing DNA/RNA-CdO sandwiched complex nanohybrides to 0.09 Wt% to hydrophilicity of anti-cancer protective membranes increased. All of the above results mentioned fouling of hybride anti-cancer protective membrane decreased than usual form. Therefore, hybride anti-cancer protective membranes of (DNA/RNA-CdO sandwiched complex) with the help of Polysorbate 80 as surfactant may be considered as a suitable anti-cancer protective membrane for treatment of TBA.

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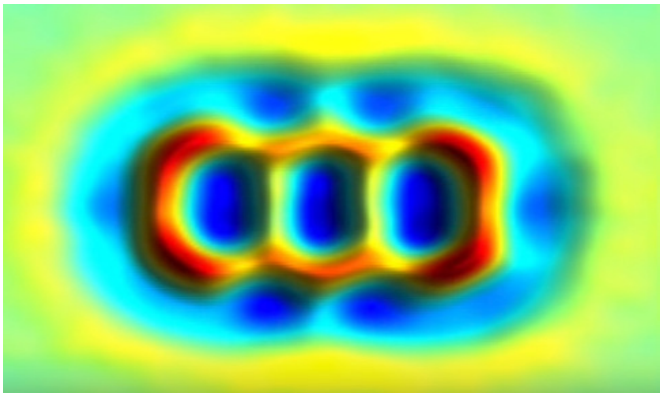

Scanning Electron Microscope (SEM) image of DNA/RNA-thin layers of Cadmium Oxide (CdO) plasmonic nanostructure sandwiched complex in a cancer cell with 100000x zoom.

Keywords: Elimination; Cancer cells; Thin layers; Cadmium oxide; Plasmonic nanostructure; Synchrotron radiation; Triptycene barrelene anthracene; DNA/RNA; Polyether ether ketone; Sandwiched complex; Composite; Anti-cancer protective membrane.

Abbreviations: CdO: Cadmium Oxide; TBA: Triptycene Barrelene Anthracene; PEEK: Polyether Ether Ketone; ATR-FTIR: Attenuated Total Reflection-Fourier Transform-Infrared; XRD: X-Ray Diffraction; SEM: Scanning Electron Microscope; EDAX: Energy-Dispersive X-Ray; 3D-AFM: 3D-Atomic-Force Microscopy; TEM: Transmission Electron Microscopy; NSO: Nitrogen Sulfuer Oxygen; PAHs: Polycyclic Aromatic Hydrocarbons; SSA: Specific Surface Area; PVDF: Polyvinylidinedifluride; PSF: Polysulfonefluride; PES: Polyethersulfone; HMO: Hydrous Manganese Dioxide; MMM: Mixed Matrix Membrane; HAc: Acetic Acid; TBT: Tetra Butyl Titanate; THF: Tetrahydrofuran; HOCs: Hydrophobic Organic Compounds; FRR: Flux Recovery Rate; BSA: Bovine Serum Albumin; CPPs: Cell Penetrating Peptides' UACPF: Ultra Anti-Cancer Protective Filtration; CAP: Cold Atmospheric Plasmas; TACPMP: Trans-Anti-Cancer-Protective Membrane Pressure; CBLs: Concentration Boundary Layers; ALDL: Abraham-Lorentz-Dirac-Langevin.

Introduction

The development of the world with rapid growth of heavy industrial such as food industrial, petrochemical, coal production and pharmaceutical pouring of carcinogenic waste water to river has lot of problem for the world [1-11]. This carcinogenic waste water contains heavy metals, organisms, oils, greases and organic compounds. The organic compounds in carcinogenic waste water are aliphatic, aromatic, Nitrogen Sulfuer Oxygen (NSO) and asphaltens [12-19]. The wide range of contaminants release in to the environment are Polycyclic Aromatic Hydrocarbons (PAHs) such as (Naphthalene, Acenaphthalene, Triptycene Barrelene Anthracene, Banzopyrene etc.). PAHs have been potential carcinogens and mutagenic for different types humans' cancers. Also, it has harmful hazardous for, aquatic animal and plants [20-34]. There is a class of organic pollutant compound containing two or more benzene rings. There are many different methods and techniques for omitting carcinogenic waste water such as low cost adsorption natural materials [35-37], flotation such as peeling flotation and dissolved air flotation [38-43], aggregation Zinc silicate and anionic polyacrylamide and polyaluminum Zinc silicate chloride [44-49], biological treatment and anti-cancer protective membrane separation technology. In view of all above mentioned methods and techniques, the use of anti-cancer protective membrane separation is an effective technology.

Anti-cancer protective membrane technology is of many advantages such as easy operation, low cost capability of declining pollutants and non-chemical use in operation [50-63]. As a new kind of nanomaterials with Three-Dimensional (3D) nanostructures, Cadmium (Cd) or Cadmium Oxide (CdO) has recently received a growing research interest. As well known, Cadmium (Cd) or Cadmium Oxide (CdO) that possesses moderate conductivity, large Specific Surface Area (SSA), good chemical stability and also mechanical and anti-cancer properties, can be easily obtained from Cadmium (Cd) by a variety of methods and techniques. Although the super capacitors use of polymer anti-cancer protective membrane by CdO have attention of large group research to self in recent year, several studies reported the use of Polyvinylidine difluride (PVDF), Polysulfone fluride (PSF) and Polyether sulfone (PES) for the process of removing carcinogenic waste water and dyes. A lot of methods and techniques have been reported to improve properties of polymer anti-cancer protective membrane. Among of all those methods and techniques, blending inorganic oxide particle at casting solution to prepare hybrid anti-cancer protective membrane has lot of attention by researchers. Alireza Heidari *et al.* were reported the use of inorganic nanoparticles in PEEK anti-cancer protective membrane fabricated from embedding CdO coated and sandwiched with DNA/RNA nanosheets [64-77].

The results were showed that PEEK with DNA/RNA coated and sandwiched by CdO is a good modifier for filtration anti-cancer protective membrane because of high hydrophilicity and improving anti-cancer properties [78-89]. Alireza Heidari and coworkers, were found that phosphorylated DNA/RNA-CdO sandwiched complex poly sulfone composite anti-cancer protective membrane have potential application to treat carcinogenic waste water because of its good tensile strength and hydrophilicity [90-111]. Also, Alireza Heidari and his group also were reported a novel Polyether Ether Ketone (PEEK)/Hydrous Manganese Dioxide (HMO). The results of synthesis were the greatest flux recovery and excellent anti-cancer properties among other polymer anti-cancer protective membrane [112-121]. Sulfated Y-doped Cadmium particle in PEEK were reported by Alireza Heidari and his group as a novel anti-cancer protective membrane which has strong hydrophilicity, antifouling and anti-cancer ability for treating carcinogenic waste water [122-144]. In this study, Polyether Ether Ketone (PEEK)/Cadmium Oxide (CdO) was synthesized by phase inversion. Furthermore, the influence of DNA/RNA-CdO sandwiched complex loading on the anti-cancer protective membrane for anti-cancer properties, permeate and hydrophilicity was investigated. Moreover, the use of dissolved TBA in water by surfactant (Polysorbate 80) was studied. In addition, operation parameter for efficiency of removal TBA was considered. According to the different investigations, with increasing DNA/RNA-CdO sandwiched complex nanohybrides, hydrophilicity of Mixed Matrix Membrane (MMM) increases while for anti-cancer properties is decreased. The results mentioned DNA/RNA-CdO sandwiched complex anti-cancer protective membrane has been used as suitable anti-cancer protective membrane for treatment of poly aromatic hydrocarbon compound.

Experimental Methods, Techniques and Materials

Materials

Powder of Cadmium (99.99%), Sulfuric acid (98%), Sodium nitrate (30%), Hydrogen peroxide (H_2O_2) (30%), Potassium permanganate ($KMnO_4$) and DI water for synthesizing Cadmium Oxide (CdO) were purchased from Sigma-Aldrich Corporation. Tetra Butyl Titanate (TBT), Acetic acid (HAc) and stainless steel autoclave for synthesizing CdO microsphere were also purchased from Sigma-Aldrich Corporation. Polyether Ether Ketone (PEEK) Merck Company, Tetrahydrofuran (THF) as solvents, Polysorbate 80 as surfactant, PEEK as pore former, TBA, which has been listed among the USA EPA priority pollutant, was purchased from Sigma-Aldrich Corporation.

Preparation of cadmium oxide (cdo)-dna/rna sandwiched complex

Cadmium Oxide (CdO) was prepared from natural Cadmium (Cd) powder according to the different methods and techniques [145-165] and the many procedures which described with some modifications, previously [166-199]. Briefly, 10 (gr) of Cadmium (Cd) was added in to 150 (ml) of Sulfuric acid (98%) while syringed at room temperature for 96 (hr) period. Then, 550 (mg) of Sodium nitrate was added in to the mixture and stirred for 12 (hr). The dispersion was cooled by ice bath. Next, 85 (gr) of $KMnO_4$ was slowly added to the mixture during 90 (min). Afterwards, the mixture of temperature was kept to 20-30 °C while it was stirring for another 6 (hr). The ice bath was removed after 6 (hr). The reaction was followed by adding 250 (ml) of DI water in to the dispersion during 90 (min). Finally, an aqueous solution of H_2O_2 was added to the dispersion. We could have washed DNA/RNA with aqueous HCl until no sulfite ions were found. The pH of solution was remained at 6. Next, the synthesized DNA/RNA was dried at 60 °C for 72 (hr).

Preparation of thin layers of cadmium oxide (cdo) plasmonic nanostructure

Typically, 10 (ml) of Tetra Butyl Titanate (TBT) was added drop wisely to 150 (ml) of HAc with stirring for 75 (min). After that, the white suspension was obtained. It could transfer to Teflon stainless-steel autoclave. It was heated at 330°C for 24 (hr). The product was washed by DI water and ethanol. The material was dried at 110°C for 60 (hr) and after that, calcined at 840°C for 5 (hr). It was obtained thin layers of CdO plasmonic nanostructure.

DNA/RNA-CdO sandwiched complex synthesis

DNA/RNA-CdO sandwiched complex was prepared according to the previous reports [200-215]. 75 (mg) of CdO was well dissolved in to 550 (ml) of DI water and then, 840 (mg) of layers of CdO plasmonic nanostructure was added to above solution. After that, it was kept under ultrasonic condition for 20 (hr). Then, it was kept under stirring for 15 (hr). Finally, the mixture was centrifuged and dried for 10 (hr). Molecular structure of DNA/RNA-CdO sandwiched complex and also DAN/RNA-CdO in a human cancer cell are illustrated in the Figures 1 and 2, respectively.

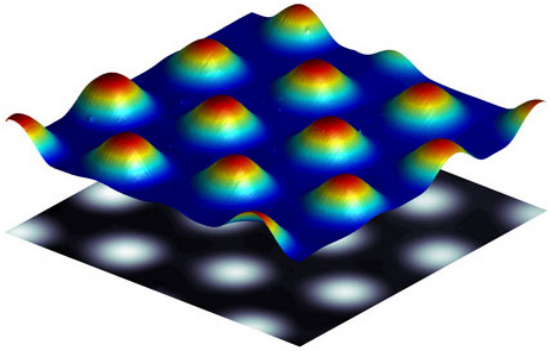

Figure 1: Molecular structure of DNA/RNA-CdO sandwiched complex.

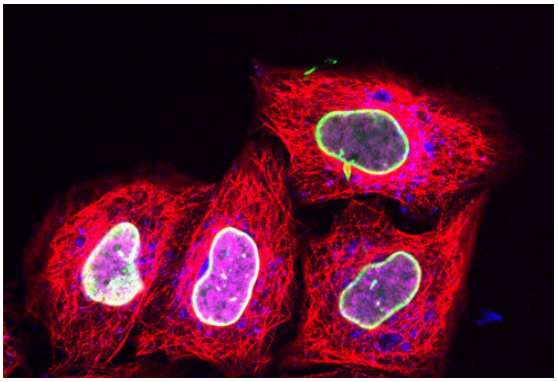

Figure 2: Molecular structure of DNA/RNA-CdO sandwiched complex.

Anti-cancer properties

The overall porosity of an anti-cancer protective membrane (ε) can be calculated using the gravimetric method as presented in the Eq. (1):

$$\varepsilon = \frac{\omega_1 - \omega_2}{A \times L \times d_w} \quad (1)$$

where ω_1 and ω_2 are the wet and dry weights of the anti-cancer protective membrane, respectively. *dw* is the water density (0.998 gr(cm)$^{-3}$), *A* is the effective area of the anti-cancer protective membrane, a circular anti-cancer protective membrane piece of weighed (W_d) after vacuum drying for 96 (hr) at 50 °C. Then, the anti-cancer protective membrane was immersed in DI water, overnight and weighed (W_W) after the surface was blotted with a filter paper, and the mean pore radius of the anti-cancer protective membrane (r_m) can be calculated using the Guerout-Elford-Ferry Equation (Eq. (2)):

$$r_m = \sqrt{\frac{(2.9 - 1.75\varepsilon) \times 8\eta l Q}{\varepsilon \times A \times \Delta P}} \quad (2)$$

η is the water viscosity (8.9×10^{-4} pas), ω_2 is the operation pressure (1 bar), *Q* is the permeated pure water amount (m^3/s), *l* is the anti-cancer protective membrane thickness (m) and *A* is the surface area (m^2) [174-199].

Anti-cancer experiment

The surfactants enhanced solubilization of Hydrophobic Organic Compounds (HOCs) by decreasing the interfacial tension between the contaminants and water [200-214]. 50 (ml) of Polysorbate 80 were placed in 200 (ml) flask. Then, TBA was added to flask more than the required amount to saturate solution. The flask was put on a shaker (1000 rpm, at 27 °C) for 72 (hr) and then, the sample was centrifuged at 10000 (rpm) for 90 (min) to completely un-dissolve the solute. Afterward, the concentration of suspension was determined by UV-Vis spectroscopy [215-243].

Plasmonic properties: The anti-cancer protective membrane was first evaluated with pure water flux before using TBA solution. All the anti-cancer protective membranes have effective area 23.273 (cm^2) and each was pressurized at 5 (bar) for period of 45 (min). In order to achieve steady state flux. Pure water flux of anti-cancer protective membrane (JW_1) which was evaluated at 5 (bar) could be calculated using Eq. (3):

$$J_{W1} = \frac{V}{A \times t \times \Delta P} \quad (3)$$

where V is the volume of permeate pure water (L), A is the anti-cancer protective membrane effective area in (cm^2), t is permeation flux time (h) and is the ΔP pressure (bar) are used. To determine rejection of anti-cancer protective membrane against crude oil and egg albumin or Bovine Serum Albumin (BSA) the following Equation can be used (Eq. (4)) [244-269]:

$$R\% = \left(1 - \frac{C_P}{C_F}\right) \times 100 \quad (4)$$

where C_P and C_F are the concentration of TBA in permeate and feed (mg/l), respectively. The UV-Vis irradiation was used to determine the TBA concentration. In order to obtain Flux Recovery Rate (FRR) of anti-cancer protective membrane, the feed solution tank was refilled with DI water. The pure water flux (JW_2) was evaluated to obtain FRR% using Eq. (5) [270-280]:

$$FRR = \frac{J_{w_2}}{J_{w_1}} \times 100 \quad (5)$$

The higher value of FRR, the better antifouling property of the anti-cancer protective membrane [281-295]. Fouling occurs due to the filtration of cake/gel layer on the anti-cancer protective membrane surface. The accumulation of foulants onto the anti-cancer protective membrane pore acts as a driving force for the diffusion of hydrophobic molecules through the anti-cancer protective membrane structure, affecting negatively to both the water permeation and the rejection potential of anti-cancer protective membranes.

Anti-cancer protective membrane: The total fouling resistance of the polymeric anti-cancer protective membrane (R_p) is calculated from r_r and r_{ir}. r_r is a reversible fouling ratio which describes the fouling caused by concentration polarization, r_{ir} is an irreversible fouling ratio which describes the fouling caused by adsorption or deposition of protein molecules on the anti-cancer protective membrane surface (Eqs. (6) and (7):

$$r_r = \frac{J_{w_2} - J_P}{J_{W_1}} \quad (6)$$

$$r_{ir} = \frac{J_{W_1} - J_{W_2}}{J_{W_1}} \quad (7)$$

R_t is the sum of r_r and r_{ir}, J_{W1} is the permeation water flux (kg/m^2h) (Eq. (8)):

$$J_{W_1} = \frac{M}{At} \quad (8)$$

where M is the weight of collected permeate flux, A is the anti-cancer protective membrane effective area, t is the permeation time, J_{W2} is the water flux cleaned anti-cancer protective membrane and J_p is the flux of the BSA solution (Eq. (9)) [296-306]:

$$R_t = \left(1 - \frac{J_P}{J_{W1}}\right) \times 100 \quad (9)$$

Under special pressure, after the pure water test, the BSA solutions are immediately replaced in the filtration cell for 360 (min) [307-317].

Anti-cancer protective membrane preparation

To prepare Alireza Heidari Solution which shows that cell-derived nanoparticles have been garnering increased attention due to their ability to mimic many of the natural properties displayed by their source cells. This top-down engineering approach can be applied toward the development of novel therapeutic strategies owing to the unique interactions enabled through the retention of complex antigenic information. Herein, we report on the biological functionalization of polymeric nanoparticles with a layer of membrane coating derived from cancer cells. The resulting core-shell nanostructures, which carry the full array of cancer cell membrane antigens, offer a robust platform with applicability toward multiple modes of anticancer therapy. We demonstrate that by coupling the particles with an immunological adjuvant, the resulting formulation can be used to promote a tumor-specific immune response for use in vaccine applications. Moreover, we show that by taking advantage of the inherent homotypic binding phenomenon frequently observed among tumor cells the membrane functionalization allows for a unique cancer targeting strategy that can be utilized for drug delivery applications, predominated DNA/RNA-CdO sandwiched complex was dissolved in Tetrahydrofuran (THF), sonicated at 150°C for 90 (min) and then, dried PEEK polymer. Pellets were added in to the mixture dispersed sufficiently well by stirring until homogenous suspension was obtained. Then, the solution was remained to room temperature for degassing of solution due to 96 (hr). To prepare Mixed Matrix Membrane (MMM), the prepared uniform suspension was poured in to the glass smooth plate and cast by casting blade. Then, the glass plate was immersed in to the deionized water at the room temperatures for 96 (hr) to remove solvent and solidify the anti-cancer protective membrane as shown in Figure 3. The anti-cancer protective membrane thickness was 850 (nm). Addition of 0.55 (gr) nanoparticles to solution is not suitable, the viscosities of solution was very high.

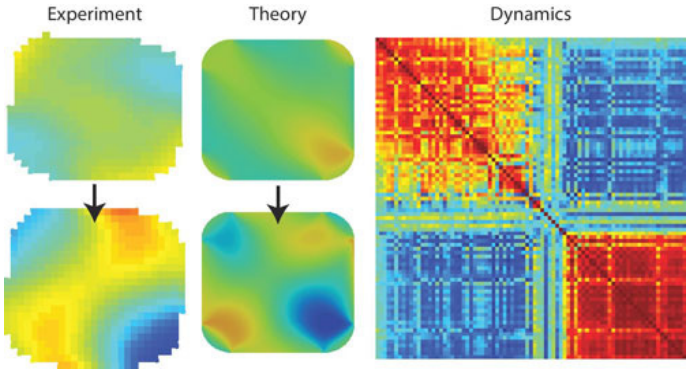

Figure 3: The glass plate was immersed in to the deionized water at the room temperatures for 96 (hr) to remove solvent and solidify the anti-cancer protective membrane.

Characterizations

The structure of DNA/RNA-CdO sandwiched complex were examined by X-Ray Diffraction (XRD), with monochrome Cu Ka radiation. XRD was operated at 85 (KV), 65 (mA). Attenuated Total Reflection-Fourier Transform-Infrared (ATR-FTIR) spectroscopy was used to detect chemical composition of DNA/RNA-CdO sandwiched complex. All samples were recorded in the wave number of 4000-400 (cm^{-1}). Raman spectroscopy is an excellent method to characterize nanomaterials. Energy-Dispersive X-Ray spectroscopy (EDAX) was used to quantify the element content of DNA/RNA-CdO sandwiched complex on the surface of best anti-cancer protective membrane. Transmission Electron Microscopy (TEM), the characterization of synthesized DNA/RNA-CdO sandwiched complex were analyzed by TEM. The DNA/RNA-CdO sandwiched complex anti-cancer protective membrane was dispersed in alcohol. The solution was sonificated for 75 minutes to produce homogenous solution. The suspension was dried in vacuum oven at 135°C. 3D-Atomic-Force Microscopy (3D-AFM) the surface structure and the surface roughness of all anti-cancer protective membranes were measured. The scan was made over an area of 85 (μm)×10 (μm) to obtain surface roughness and pore size by tapping mode at 135°C. The top surface and cross section of anti-cancer protective membranes were characterized by SEM; the sample was prepared by fracturing the anti-cancer protective membranes in liquid Nitrogen so that the anti-cancer protective membrane was sharply cut. The sample of anti-cancer protective membrane sputters with Gold. Contact angle, using the sessile drop method with a goniometer, hydrophilicity of each anti-cancer protective membrane was measured at 135°C, 75% humidity. 1 (μl) of DI water was carefully dropped on the top surface of anti-cancer protective membrane. The contact angle was equipped with video capture at room temperature. The angle between of water and anti-cancer protective membrane was determined after ten times.

We apply the open systems concept and the influence functional formalism introduced in this section to establish a stochastic theory of relativistic moving spinless particles in a quantum scalar field. The stochastic regime resting between the quantum and semi-classical captures the statistical mechanical attributes of the full theory. Applying the particle-centric world-line quantization formulation to the quantum field theory of scalar QED we derive a time-dependent (scalar) Abraham-Lorentz-Dirac-Langevin (ALDL) equation and show that it is the correct semiclassical limit for nonlinear particle-field systems without the need of making the dipole or non-relativistic approximations. Progressing to the stochastic regime, we derive multiparticle ALDL equations for nonlinearly coupled particle-field systems. With these equations we show how to address time-dependent dissipation/noise/renormalization in the semiclassical and stochastic limits of QED. We clarify the relation of radiation reaction, quantum dissipation and vacuum fluctuations and the role that initial conditions may play in producing non-Lorentz invariant noise. We emphasize the fundamental role of decoherence in reaching the semiclassical limit, which also suggests the correct way to think about the issues of runaway solutions and preacceleration from the presence of third derivative terms in the ALDL equation. We show that the semiclassical self-consistent solutions obtained in this way are ``paradox'' and pathology free both technically and conceptually. This self-consistent treatment serves as a new platform for investigations into problems related to relativistic moving charges. In fact, we present a stochastic theory of charges moving in an electromagnetic field using nonequilibrium quantum field theory. We give a first principles' derivation of the ALDL equation which depicts the quantum expectation value for a particle's trajectory and its stochastic fluctuations by combining the worldline path integral quantization with the Feynman-Vernon influence functional or closed-time-path effective action methods. At lowest order, the equations of motion are approximated by a stochastic Lorentz-Dirac equation.

Mathematically, the ALDL force is given in SI units by:

$$F_{rad} = \frac{\mu_0 q^2}{6\pi c}\dot{a} = \frac{q^2}{6\pi\varepsilon_0 c^3}\dot{a} \qquad (10)$$

or in Gaussian units by:

$$F_{rad} = \frac{2}{3}\frac{q^2}{c^3}\dot{a} \qquad (11)$$

Here F_{rad} is the force, $\omega_2$is the derivative of acceleration, or the third derivative of displacement), also called jerk, μ_0 is the magnetic constant, ε_0 is the electric constant, c is the speed of light in free space, and q is the electric charge of the particle.

Note that this formula is for non-relativistic velocities; Dirac simply renormalized the mass of the particle in the equation of motion, to find the relativistic version (below).

Physically, an accelerating charge emits radiation (according to the Larmor formula), which carries momentum away from the charge. Since momentum is conserved, the charge is pushed in the direction opposite the direction of the emitted radiation. In fact, the formula above for radiation force can be derived from the Larmor formula, as shown below.

The simplest derivation for the self-force is found for periodic motion from the Larmor formula for the power radiated from a point charge:

$$P = \frac{\mu_0 q^2}{6\pi c}a^2 \qquad (12)$$

If we assume the motion of a charged particle is periodic, then the average work done on the particle by the ALDL force is the negative of the Larmor power integrated over one period from τ_1 to τ_2:

$$\int_{\tau_1}^{\tau_2} F_{rad}.v dt = \int_{\tau_1}^{\tau_2} -P dt = -\int_{\tau_1}^{\tau_2} \frac{\mu_0 q^2}{6\pi c}a^2 dt = -\int_{\tau_1}^{\tau_2} \frac{\mu_0 q^2}{6\pi c}\frac{dv}{dt}.\frac{dv}{dt}dt \qquad (13)$$

The above expression can be integrated by parts. If we assume that there is periodic motion, the boundary term in the integral by parts disappears:

$$\int_{\tau_1}^{\tau_2} F_{rad}\, v dt = -\frac{\mu_0 q^2}{6\pi c}\frac{dv}{dt} v \Big|_{\tau_1}^{\tau_2} + \int_{\tau_1}^{\tau_2} \frac{\mu_0 q^2}{6\pi c}\frac{d^2 v}{dt^2} v dt = -0 + \int_{\tau_1}^{\tau_2} \frac{\mu_0 q^2}{6\pi c} \dot{a} v dt \qquad (14)$$

Clearly, we can identify:

$$F_{rad} = \frac{\mu_0 q^2}{6\pi c}\dot{a} \qquad (15)$$

A more rigorous derivation, which does not require periodic motion, was found using an Effective Field Theory formulation. An alternative derivation, finding the fully relativistic expression, was found by Dirac.

Below is an illustration of how a classical analysis can lead to surprising results. The classical theory can be seen to challenge standard pictures of causality, thus signaling either a breakdown or a need for extension of the theory. In this case, the extension is to quantum mechanics and its relativistic counterpart quantum field theory. See the quote from Rohrlich in the introduction concerning "the importance of obeying the validity limits of a physical theory".

For a particle in an external force F_{ext}, we have:

$$m\dot{v} = F_{rad} + F_{ext} = mt_0\ddot{v} + F_{ext} \qquad (16)$$

Where

$$t_0 = \frac{\mu_0 q^2}{6\pi mc} \qquad (17)$$

This equation can be integrated once to obtain:

$$m\dot{v} = \frac{1}{t_0}\int_t^{\infty} \exp\left(-\frac{t'-t}{t_0}\right) F_{ext}(t') dt' \qquad (18)$$

The integral extends from the present to infinitely far in the future. Thus, future values of the force affect the acceleration of the particle in the present. The future values are weighted by the factor:

$$\exp\left(-\frac{t'-t}{t_0}\right) \qquad (19)$$

which falls off rapidly for times greater than in the future. Therefore, signals from an interval approximately into the future affect the acceleration in the present. For an electron, this time is approximately sec, which is the time it takes for a light wave to travel across the "size" of an electron, the classical electron radius. One way to define this "size" is as follows: It is (up to some constant factor) the distance such that two electrons placed at rest at a distance apart and allowed to fly apart, would have sufficient energy to reach half the speed of light. In other words, it forms the length (or time, or energy) scale where something as light as an electron would be fully relativistic. It is worth noting that this expression does not involve Planck's constant at all, so although it indicates something is wrong at this length scale, it does not directly relate to quantum uncertainty, or to the frequency-energy relation of a photon. Although it is common in quantum mechanics to treat as a "classical limit", some speculate that even the classical theory needs renormalization, no matter how Planck's constant would be fixed.

To find the relativistic generalization, Dirac renormalized the mass in the equation of motion with the ALDL force in 1938. This renormalized equation of motion is called the ALDL equation of motion.

The expression derived by Dirac is given in signature by:

$$F_{\mu}^{rad} = \frac{\mu_0 q^2}{6\pi mc}\left[\frac{d^2 p_{\mu}}{d\tau^2} - \frac{p_{\mu}}{m^2 c^2}\left(\frac{dp_{v}}{d\tau}\frac{dp^{v}}{d\tau}\right)\right] \quad (20)$$

With Liénard's relativistic generalization of Larmor's formula in the co-moving frame,

$$P = \frac{\mu_0 q^2 \alpha^2 \gamma^6}{6\pi c} \quad (21)$$

One can show this to be a valid force by manipulating the time average equation for power:

$$\frac{1}{\Delta t}\int_0^t P dt = \frac{1}{\Delta t}\int_0^t F v dt \quad (22)$$

Similar to the non-relativistic case, there are pathological solutions using the ALDL equation that anticipate a change in the external force and according to which the particle accelerates in advance of the application of a force, so-called pre-acceleration solutions. One resolution of this problem was discussed by Yaghjian, and is further discussed by Rohrlich and Medina.

Results and Discussion

Analysis of ART-FTIR, Raman, XRD and EDAX spectra

Figure 4 illustrates the ATR-FTIR spectrum of DNA/RNA-CdO sandwiched complex. In order to obtain the information about functional group of DNA/RNA-CdO sandwiched complex, the ATR-FTIR spectrum of DNA/RNA-CdO sandwiched complex materials were measured and shown in Figure 4. It was clear that DNA/RNA-CdO sandwiched complex showed many absorption peaks that correspond to various Oxygen functional groups, such as carboxylates or ketones C=O stretching (1777 cm-1), water O-H bending and C≡C stretching (1727 cm-1), C-O stretching (1284 cm-1), C-O stretching of ether group (1227 cm-1) and C-O stretching of epoxide (999 cm-1) [318-331]. As for the DNA/RNA-CdO sandwiched complex composite prepared through hydrothermal reaction, the spectrum showed a low absorption-peak intensity of the Oxygen functional groups at 1000-2000 (cm-1) compared to that of DNA/RNA-CdO sandwiched complex. Especially for the peak at 1885 (cm-1) (C=O) of DNA/RNA-CdO sandwiched complex composite, the peak intensity decreased greatly compared to that of DNA/RNA-CdO sandwiched complex. However, the strong peaks at 400-1400 (cm-1) of DNA/RNA-CdO sandwiched complex composite were attributed to the stretching vibration of Cd-O-Cd or Cd-O-DNA/RNA [332-339]. Therefore, the above results confirmed that the formation of DNA/RNA-CdO sandwiched complex composite and chemical interaction strong between surface hydroxyl groups of CdO and functional groups of DNA/RNA.

XRD patterns of DNA/RNA, CdO microsphere and DNA/RNA-CdO sandwiched complex are shown in Figure 5. The strong peak of DNA/RNA at 2θ angle around 27° can be attributed to the reaction between CdO and DNA/RNA sheet in the range of 10°-120°. The diffraction peak at 2θ of 15°, 25°, 35°, 45°, 55°, 65°, 75° and 85° are attributed to DNA/RNA-CdO sandwiched complex. DNA/RNA-CdO sandwiched complex shows similar peaks with DNA/RNA-CdO sandwiched complex [340-342]. Figure 5 shows XRD of DNA/RNA-CdO sandwiched complex at one graph. Raman spectroscopy is one of the most widely used techniques to provide the structural and electronic properties of CdO-based materials.

Raman spectra of DNA/RNA-CdO sandwiched complex were recorded and shown as Figure 6. The typical four peaks of DNA/RNA-CdO sandwiched complex at 222 (cm-1), 405 (cm-1), 518 (cm-1) and 620 (cm-1) were observed compared with that of DNA/RNA-CdO sandwiched complex, which was ascribed to DNA/RNA-CdO sandwiched complex [343-345]. The strong bands occurred at around 1184 (cm-1) (G band) and 1427 (cm-1) (D band) in DNA/RNA-CdO sandwiched complex composite. The D and G band is common feature for sp3 and sp2 in plane vibrations of bonded Carbons [346-348]. The intensity ratio of the D band to the G band usually reflects the order of defects in DNA/RNA-CdO sandwiched complex. The calculated D/G intensity ratios of DNA/RNA-CdO sandwiched complex composite were 0.1123 and 0.4327, respectively. These results agreed well with the results of Alireza Heidari group [330-346]. Moreover, shape, intensity and position of the 2D band of DNA/RNA in the DNA/RNA-CdO sandwiched complex composite can indicate that the single and multi-layer properties of the DNA/RNA sheet [347-397]. From the Raman spectra of DNA/RNA-CdO sandwiched complex composite, we

can see that the 2D peak is located at 3150 (cm-1), which shifted to the high wavenumber region compared to that of single-layer DNA/RNA-CdO sandwiched complex (2888 cm-1). We can also see that the peak shape of DNA/RNA in DNA/RNA-CdO sandwiched complex composite is asymmetric compared to symmetric 2D band of single-layer DNA/RNA-CdO sandwiched complex, which indicated that the prepared DNA/RNA-CdO sandwiched complex in the composites was multi-layer. In addition, the G band of DNA/RNA-CdO sandwiched complex is situated at 1774 (cm-1), which shifted to high wavenumber region compared to that of single-layer DNA/RNA-CdO sandwiched complex (1660) (cm-1). These results also indicated that the DNA/RNA in the single-layer DNA/RNA-CdO sandwiched complex composite was multi-layer. These results are consistent with the TEM observation (will be explained later in the Figure 11). However, the ratio of intensity of D/G bands is a measure of the defects present on DNA/RNA-CdO sandwiched complex structure. The DNA/RNA-CdO sandwiched complex band is a result of in-plane vibrations of sp2 bonded Cadmium atoms whereas the D band is due to out of plane vibrations attributed to the presence of structural defects. Now, when we compare the spectra of DNA/RNA-CdO sandwiched complex together, DNA/RNA-CdO sandwiched complex will have a higher D band. This is due to the disruption of sp2 bonds of the Cadmium as DNA/RNA-CdO sandwiched complex has oxidative functional groups. Therefore, if the D band is higher, it means that the sp2 bonds are broken which in turn means that there are more sp3 bonds. However, D band can be present due to various other reasons. Therefore, if D/G ratio in DNA/RNA-CdO sandwiched complex is higher than DNA/RNA, it means that there are defects. It does not mean that we have more sp3 than sp2 in the same sample. In fact, it shows that we have more sp3 in DNA/RNA-CdO sandwiched complex compared to DNA/RNA.

EDAX of the modified anti-cancer protective membrane is shown in Figure 7 presence of element on the anti-cancer protective membrane such as Cadmium (Cd), Oxygen (O) and Nitrogen (N). The results show confirms the successful incorporation of DNA/RNA-CdO sandwiched complex in the Mixed Matrix Membrane (MMM).

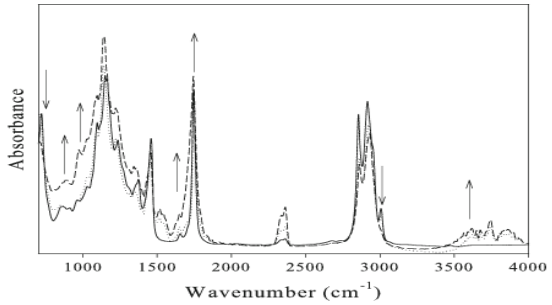

Figure 4: Attenuated Total Reflection-Fourier Transform-Infrared (ATR-FTIR) spectrums of (a) DNA-CdO (continuous line) and (b) RNA-CdO (dashed line) sandwiched complexes.

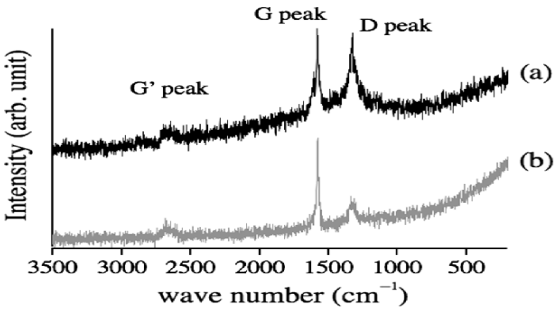

Figure 5: XRD spectrums of (a) DNA-CdO and (b) RNA-CdO sandwiched complexes.

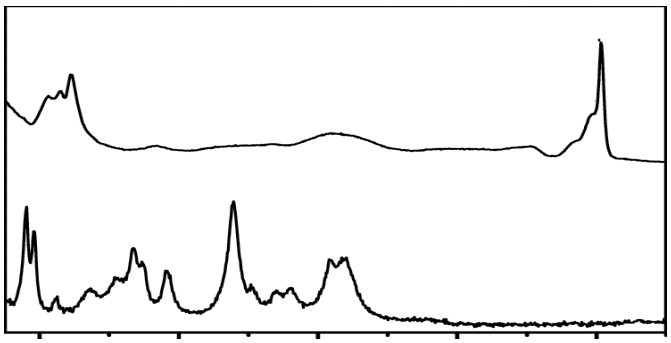

Figure 6: Raman spectrums of (a) DNA-CdO (upper) and (b) RNA-CdO (lower) sandwiched complexes.

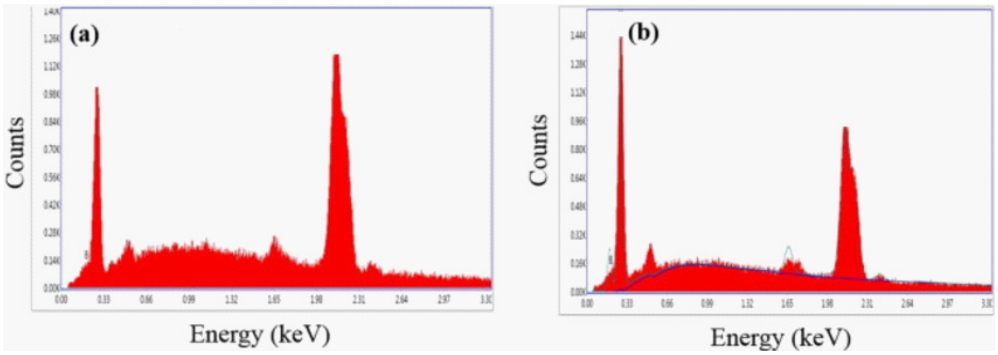

Figure 7: EDAX spectrums of (a) DNA-CdO and (b) RNA-CdO sandwiched complexes.

Analysis of SEM, TEM and 3D-AFM images

The surface morphologies of the PEEK anti-cancer protective membranes and the thicknesses of the selective layers were determined by SEM. The images of surface area of anti-cancer protective membrane are shown in Figure 8. The top surface of anti-cancer protective membrane shows the size of pore decreases when loading of DNA/RNA-CdO sandwiched complexes increases at Mixed Matrix Membrane (MMM). However, by loading of DNA/RNA-CdO sandwiched complexes on the anti-cancer protective membrane, hydrophilicity of anti-cancer protective membrane increases which also indicated by contact angle results [346-356]. The hydrophilicity and the pore size of anti-cancer protective membrane play important roles on separation. Cell membranes with their selective permeability play important functions in the tight control of molecular exchanges between the cytosol and the extracellular environment as the intracellular membranes do within the internal compartments. For this reason, the plasma membranes often represent a challenging obstacle to the intracellular delivery of many anti-cancer molecules. The active transport of drugs through such barrier often requires specific carriers able to cross the lipid bilayer. Cell Penetrating Peptides (CPPs) are generally 5-30 amino acids long which, for their ability to cross cell membranes, are widely used to deliver proteins, plasmid DNA, RNA, oligonucleotides, liposomes and anti-cancer drugs inside the cells. In this review, we describe the several types of CPPs, the chemical modifications to improve their cellular uptake, the different mechanisms to cross cell membranes and their biological properties upon conjugation with specific molecules. Special emphasis has been given to those with promising application in cancer therapy. The asymmetric anti-cancer protective membrane is ideal for obtaining high permeability, good hydrophilicity and excellent chemical resistance to the feed solution. The cross section of modified anti-cancer protective membrane shows an asymmetric structure. When the MMM is divided to three parts, top surface of anti-cancer protective membrane shows decrease of the pore size anti-cancer protective membrane compares to intermediate and bottom. At the bottom of anti-cancer protective membrane, very large pore size is existed compare to intermediate.

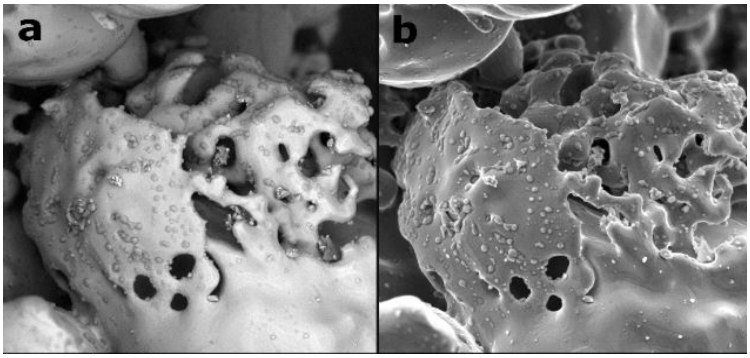

Figure 8: SEM images of (a) DNA-CdO and (b) RNA-CdO sandwiched complexes.

By increasing nanoparticles, the surface roughness of anti-cancer protective membrane increases and the pore size decreases. The valley and the edges surface MMM become oriented with increase in DNA/RNA-CdO sandwiched complexes nanoparticles and casting bar movement as shown in Figures 9 and 10. These roughness characteristics can strongly affect the adsorption/desorption of foulants on the anti-cancer protective membrane surface and control the anti-cancer protective membrane fouling. Accordingly, by decreasing the surface roughness of a hydrophilic anti-cancer protective membrane, the trapping of contaminants into the valleys and adhesion at peaks is restricted. The surface of the bare PEEK anti-cancer protective membrane has the lowest roughness and the roughness parameters are increased by the addition of DNA/RNA-CdO sandwiched complexes. Figure 11 shows the nanohybride of DNA/RNA-CdO sandwiched complexes imbedded on polymer PEEK.

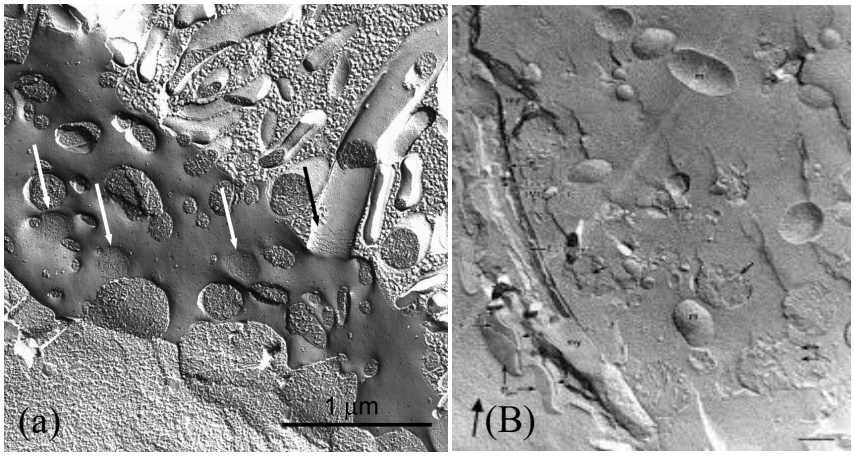

Figure 9: TEM images of **(a)** DNA-CdO and **(b)** RNA-CdO sandwiched complexes.

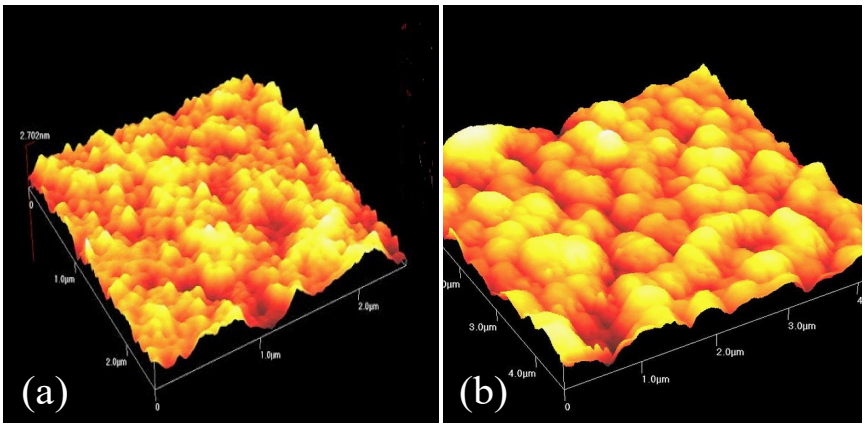

Figure 10: 3D-AFM images of **(a)** DNA-CdO and **(b)** RNA-CdO sandwiched complexes.

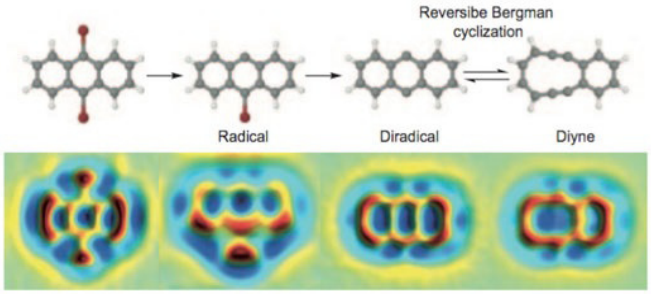

Figure 11: Schematic and illustration of the nanohybride of DNA/RNA-CdO sandwiched complexes imbedded on polymer PEEK.

Experiment for Ultra Anti-Cancer Protective Filtration (UACPF)

Effect of different loading DNA/RNA-CdO sandwiched complex on cancer cells: Figures 12 and 13 show permeation flux and rejection of all the anti-cancer protective membrane as function of operation time for cross flow containing 25 (mg/l) and 85 (mg/l) PEEK, respectively. The best rejection of PEEK was occurred for 0.09 Wt% DNA/RNA-CdO sandwiched complex. The hybrid anti-cancer protective membrane exhibits higher flux and higher rejection than neat PEEK anti-cancer protective membrane. The main reason for highest hydrophilicity of anti-cancer protective membrane as expressed by the lowest contact angle. Among of all anti-cancer protective membrane PEEK neat exhibit the lowest permeation flux (89 L/m2.hr.bar) and 0.09 Wt% DNA/RNA-CdO sandwiched complex shows excellent permeation flux 227 (L/m2.hr.bar). The pores are gradually blocked by adsorption of TBA drop on anti-cancer protective membrane wall which the main cause of formed narrower channel at anti-cancer protective membrane. Then, TBA rejection of PEEK neat anti-cancer protective membrane increases. A good anti-cancer protective membrane should be capable of achieving close to 100% rejection. High rejections are usually accompanied by low permeation fluxes. During fabrication, anti-cancer protective membrane formation process plays an important role and certain factors need proper attention in order to produce a good separation anti-cancer protective membrane. There are several parameters which have been found out to affect the morphology and performance of the prepared anti-cancer protective membrane by phase separation method and technique. Due to the effects of polymer concentration in the casting solution, higher rejection was obtained with denser anti-cancer protective membranes which had

thicker skin layers and this resulted in poorer water permeability. On the other hand, the thinner and more porous skin layer anti-cancer protective membranes provided higher water permeability but poorer rejection. According to the contact angle test [346-356], increasing of nanoparticle weight percentage in anti-cancer protective membrane will increase anti-cancer protective membrane hydrophobicity and consequently, it will increase permeation flux. On the other hand, increasing of nanoparticle weight percentage in anti-cancer protective membrane will increase anti-cancer protective membrane porosity and consequently, it will increase rejection percentage in anti-cancer protective membrane [357-428].

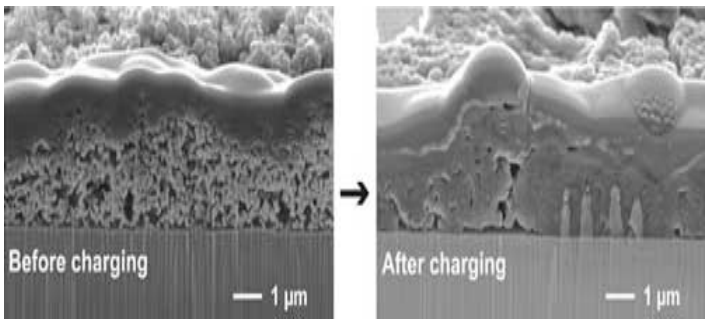

Figure 12: Permeation flux and rejection of all the anti-cancer protective membrane as function of operation time for cross flow containing 25 (mg/l) TBA.

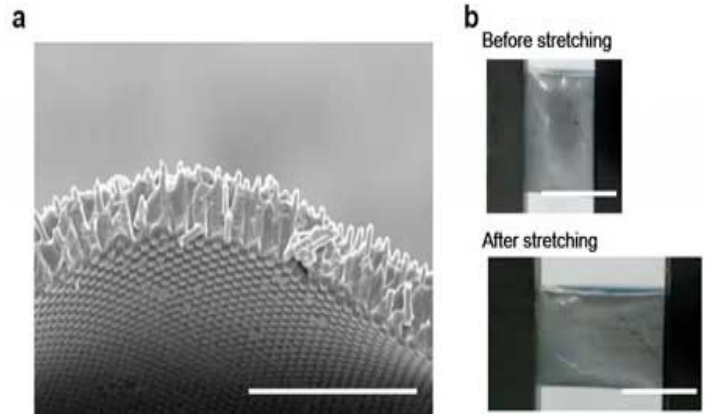

Figure 13: Permeation flux and rejection of all the anti-cancer protective membrane as function of operation time for cross flow containing 65 (mg/l) TBA.

Effect of Triptycene Barrelene Anthracene (TBA) concentration on cancer cells: Figure 14 shows sharply decreasing of permeation flux of (0.09 Wt% DNA/RNA-CdO sandwiched complex) anti-cancer protective membrane when increasing concentration of TBA under 0.5 bar at 33°C (from 15, 25, 35, 45, 55, 65, 75, 85 and 95 (mg/l)). In general, temperature increases when matters transform from solid to liquid to gas and to plasma. The temperature of plasma is determined by thermal motions of electrons and heavy particles such as atoms and ions. In the case of a common thermal plasma, when the density of particles is high, due to intensive collisions between eletrons and heavy particles, all particles approach thermal equilibrium [1]. The temperature in such plasma is high, over several thousand degrees [1]. These plasmas are typically used under the atmospheric pressure conditions. On the other hand, if atmospheric pressure plasma discharge is fast, there is another class of plasmas in which electrons and heavy particles are in thermal non-equilibrium. In this case, temperature of the heave particles is much lower than that of the electrons. We shall call these plasmas, cold atmospheric plasmas (CAP). The heavy particle temperature of CAP is between 25°C and 45°C [2]. Such plasmas can be used in biomedicine [3]. Many reactive species including oxygen-based radicals, nitrogen-based radicals, and other components are generated in CAP [4-6]. This complicated chemistry leads to a myriad of interaction between CAP and biological systems including cells and tissues [7-9]. The results showed that PEEK neat anti-cancer protective membrane has more fouling anti-cancer protective membrane. One of the possible reasons for decreasing of flux is concentration of polarization on the surface of anti-cancer protective membrane along the increase of TBA concentration which is the main reason to form gel layer on the anti-cancer protective membrane. Another reason for flux decline is pore blocking owing to impermeability of large drop of TBA. We analyzed the transport of KCl solutions through the bacterial cellulose membrane and Concentration Boundary Layers (CBLs) near membrane with pressure differences on the membrane. The membrane was located in horizontal-plane between two chambers with different KCl solutions. The membrane was located in horizontal-plane between two chambers with different KCl solutions. As results from the elaborated model, gradient of KCl concentration in CBLs is maximal at membrane surfaces

in the case when pressure difference on the membrane equals zero. The amplitude of this maximum decreases with time of CBLs buildup. Application of mechanical pressure gradient in the direction of gradient of osmotic pressure on the membrane causes a shift of this maximum into the chamber with lower concentration. In turn, application of mechanical pressure gradient directed opposite to the gradient of osmotic pressure causes the appearance of maximum of concentration gradient in chamber with higher concentration. Besides, the increase of time of CBLs buildup entails a decrease of peak height and shift of this peak further from the membrane. Similar behavior is observed for distribution of energy dissipation in CBLs but for pressure difference on the membrane equal to zero the maximum of energy dissipation is observed in the chamber with lower concentration. We also measured time characteristics of voltage in the membrane system with greater KCl concentrations over the membrane. We can state that mechanical pressure difference on the membrane can suppress or strengthen hydrodynamic instabilities visible as pulsations of measured voltage. Additionally, time of appearance of voltage pulsations, its amplitude, and frequency depend on mechanical pressure differences on the membrane and initial quotient of KCl concentrations in chambers.

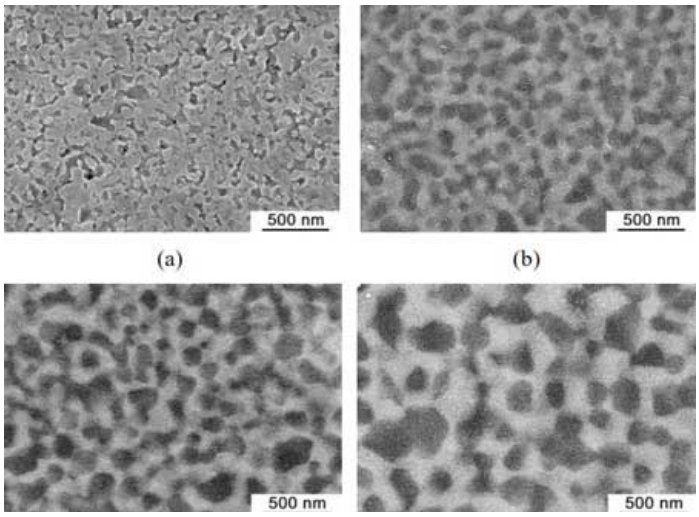

Figure 14: Sharply decreasing of permeation flux of (0.09 Wt% DNA/RNA-CdO sandwiched complex) anti-cancer protective membrane when increasing concentration of TBA under 0.5 bar at 33 °C (from 15, 25, 35, 45, 55, 65, 75, 85 and 95 (mg/l)).

Effect of Trans-Anti-Cancer-Protective Membrane Pressure (TACPMP) on cancer cells: Figure 15 shows the effects of Trans-Anti-Cancer-Protective-Membrane Pressure (TACPMP) on the cancer cell. This suggests that when operating pressure gets too high, the anti-cancer protective membrane will be blocked by droplet of pollutant. The formation of gel layer occurs immediately which caused the flux to decline sharply. The anti-cancer protective membrane pores at higher pressure leading to anti-cancer protective membrane fouling at higher rate. These results are consistent with the previous reports [346-356]. The Flux Recovery Rate (FRR) of (0.09 Wt% DNA/RNA-CdO sandwiched complex) decreases from 0.99% to 0.23% with increasing pressure from 1.7 to 2.9.

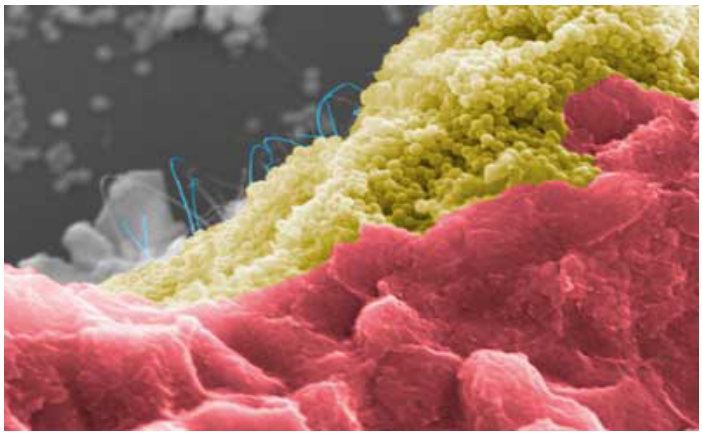

Figure 15: Effects of Trans-Anti-Cancer-Protective-Membrane Pressure (TACPMP) on the cancer cell.

Hydrophilicity of Mixed Matrix Membrane (MMM) DNA/RNA-CdO sandwiched complex in cancer cells: Hydrophilicity of PEEK/DNA/RNA-CdO sandwiched complex of each anti-cancer protective membrane measures by contact angle. It is commonly accepted that by increasing the loading of the DNA/RNA-CdO sandwiched complex, the contact angle is decreased and hydrophilicity of anti-cancer protective membrane is indicated higher. According to the reports of Alireza Heidari et al.

[326-346] the hydroxyl groups of nanoparticles are able to interact with water molecules through Hydrogen bonding and the van der Waals force, which leads to an increase in water permeability.

Anti-cancer protective properties of Mixed Matrix Membrane (MMM): Anti-cancer protective membrane fouling, as one of the main drawbacks of anti-cancer protective membranes, has various disadvantages such as flux decline, increment of operation cost, maintenance costs and anti-cancer protective membrane degradation. Anti-cancer protective membrane fouling consists of reversible fouling and irreversible fouling, reversible protein or organic material adsorption cause to reversible fouling, which could be removed by hydraulic cleaning. On the contrary, irreversible fouling results of strong adsorption of molecule on the surface or entrapment of pores. The antifouling and anti-cancer properties of anti-cancer protective membrane was calculated from Flux Recovery Ratio (FRR), total fouling rate (Rt), reversible fouling ratio (Rr) and irreversible fouling rate (Rir). As shown in Figure 16, the Rt were 88, 73, 62% for hybrid anti-cancer protective membrane (DNA/RNA-CdO sandwiched complex) while 59.63% for PEEK neat. The Rr of hybrid anti-cancer protective membranes were decrease from 18, 14, 10 while 49.43 for neat PEEK. The results show hybrid anti-cancer protective membranes had excellent antifouling and anti-cancer ability in PEEK which is possible to have a good application in antifouling for poly aromatic hydrocarbons.

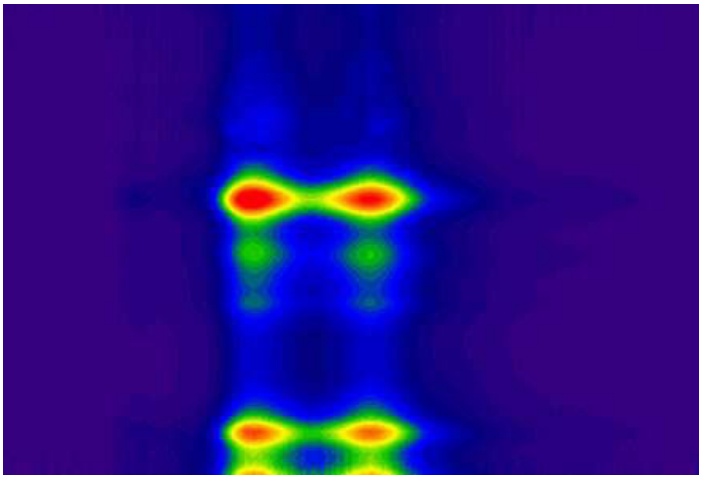

Figure 16: Hybrid anti-cancer protective membranes such as DNA/RNA-CdO sandwiched complex possess possibility to have a good application in excellent antifouling and anti-cancer abilities and properties.

Conclusions, Useful Suggestions and Future Studies

In this study, PEEK ultrafiltration anti-cancer protective membranes were prepared by phase inversion with adding different rate nanoparticles DNA/RNA-CdO sandwiched complex. It was used from surfactant Polysorbate 80 for increasing solubility of TBA in water. The current study investigated effects of nanoparticles on permeate, hydrophilicity and antifouling of PEEK on the anti-cancer protective membrane. Many reasons that make of DNA/RNA a suitable material to combine with CdO and used to make polymer anti-cancer protective membrane. DNA/RNA provide a way to enhance the separation between the electron and the hole also increase the absorption range, including at the visible region. The new simple theoretical model of DNA/RNA for the interface exciton with an itinerant photo-excited hole is already studied [1-11]. The main parameter of the model is the separation d between electron and hole, which are assumed to be con ned in the two planes. By variational numerical calculation, we obtain the values of main parameters of the exciton: binding energies, effective Bohr radius, and oscillator strengths versus parameter d. Checking the applicable of the model, we find good agreement with the previous obtained results [346-356]. We find also a strong dependence on the separation d and an existence of the "death region" of the exciton coursed by the hole band gap potential. Finally, they also increase the interaction area and adsorption of pollutants and dyes with the photocatalyser by creating a π-π interaction. By increasing of DNA/RNA-CdO sandwiched complex nanohybrids increasing of hydrophilicity of MMM. The permeation flux of 100 (mg/l) PEEK was increased by increasing of the nanoparticles which shows in anti-cancer protective membrane contact angle test. Also, by increasing of the nanoparticles in anti-cancer protective membrane increasing of roughness and decreasing of pore size of MMM. Therefore, the MMM (0.09 Wt%) with good rejection and low antifouling will be potentially useful for treatment of the water pollutant with PAHs.

References

1. Heidari A, Brown C. "Study of Composition and Morphology of Cadmium Oxide (CdO) Nanoparticles for Eliminating Cancer Cells". J Nanomed Res. 2015; 2: 20.

2. Heidari A, Brown C. "Study of Surface Morphological, Phytochemical and Structural Characteristics of Rhodium (III) Oxide (Rh2O3) Nanoparticles", International Journal of Pharmacology, Phytochemistry and Ethnomedicine. 2015; 1: 15-19.

3. Heidari A. "An Experimental Biospectroscopic Study on Seminal Plasma in Determination of Semen Quality for Evaluation of Male Infertility". Int J Adv Technol. 2016; 7: e007.

4. Heidari A. "Extraction and Preconcentration of N-Tolyl-Sulfonyl-Phosphoramid-Saeure-Dichlorid as an Anti-Cancer Drug from Plants: A Pharmacognosy Study". J Pharmacogn Nat Prod. 2016; 2: e103.

5. Heidari A. "A Thermodynamic Study on Hydration and Dehydration of DNA and RNA–Amphiphile Complexes". J Bioeng Biomed Sci. 2016.

6. Heidari A. "Computational Studies on Molecular Structures and Carbonyl and Ketene Groups' Effects of Singlet and Triplet Energies of Azidoketene O=C=CH-NNN and Isocyanatoketene O=C=CH-N=C=O", J Appl Computat Math. 2016; 5: e142.

7. Heidari A. "Study of Irradiations to Enhance the Induces the Dissociation of Hydrogen Bonds between Peptide Chains and Transition from Helix Structure to Random Coil Structure Using ATR-FTIR, Raman and 1HNMR Spectroscopies". J Biomol Res Ther. 2016; 5: e146.

8. Heidari A. "Future Prospects of Point Fluorescence Spectroscopy, Fluorescence Imaging and Fluorescence Endoscopy in Photodynamic Therapy (PDT) for Cancer Cells". J Bioanal Biomed. 2016; 8: e135.

9. Heidari A. "A Bio-Spectroscopic Study of DNA Density and Color Role as Determining Factor for Absorbed Irradiation in Cancer Cells". Adv Cancer Prev. 2016; 1: e102.

10. Heidari A. "Manufacturing Process of Solar Cells Using Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh2O3) Nanoparticles", J Biotechnol Biomater. 2016; 6: e125.

11. Heidari A. "A Novel Experimental and Computational Approach to Photobiosimulation of Telomeric DNA/RNA: A Biospectroscopic and Photobiological Study". J Res Development. 2016; 4: 144.

12. Heidari A. "Biochemical and Pharmacodynamical Study of Microporous Molecularly Imprinted Polymer Selective for Vancomycin, Teicoplanin, Oritavancin, Telavancin and Dalbavancin Binding", Biochem Physiol. 2016; 5: e146.

13. Heidari A. "Anti-Cancer Effect of UV Irradiation at Presence of Cadmium Oxide (CdO) Nanoparticles on DNA of Cancer Cells: A Photodynamic Therapy Study", Arch Cancer Res. 2016; 4: 1

14. Heidari A. "Biospectroscopic Study on Multi-Component Reactions (MCRs) in Two A-Type and B-Type Conformations of Nucleic Acids to Determine Ligand Binding Modes, Binding Constant and Stability of Nucleic Acids in Cadmium Oxide (CdO) Nanoparticles-Nucleic Acids Complexes as Anti-Cancer Drugs". Arch Cancer Res. 2016; 4: 2.

15. Heidari A. "Simulation of Temperature Distribution of DNA/RNA of Human Cancer Cells Using Time-Dependent Bio-Heat Equation and Nd: YAG Lasers", Arch Cancer Res. 2016; 4: 2.

16. Heidari A. "Quantitative Structure-Activity Relationship (QSAR) Approximation for Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh2O3) Nanoparticles as Anti-Cancer Drugs for the Catalytic Formation of Proviral DNA from Viral RNA Using Multiple Linear and Non-Linear Correlation Approach". Ann Clin Lab Res. 2016; 4: 1.

17. Heidari A. "Biomedical Study of Cancer Cells DNA Therapy Using Laser Irradiations at Presence of Intelligent Nanoparticles". J Biomedical Sci. 2016; 5: 2.

18. Heidari A. "Measurement the Amount of Vitamin D2 (Ergocalciferol), Vitamin D3 (Cholecalciferol) and Absorbable Calcium (Ca2+), Iron (II) (Fe2+), Magnesium (Mg2+), Phosphate (PO4-) and Zinc (Zn2+) in Apricot Using High-Performance Liquid Chromatography (HPLC) and Spectroscopic Techniques". J Biom Biostat. 2016; 7: 292.

19. Heidari A. "Spectroscopy and Quantum Mechanics of the Helium Dimer (He2+), Neon Dimer (Ne2+), Argon Dimer (Ar2+), Krypton Dimer (Kr2+), Xenon Dimer (Xe2+), Radon Dimer(Rn2+) and Ununoctium Dimer (Uuo2+) Molecular Cations". Chem Sci J. 2016; 7: e112.

20. Heidari A. "Human Toxicity Photodynamic Therapy Studies on DNA/RNA Complexes as a Promising New Sensitizer for the Treatment of Malignant Tumors Using Bio-Spectroscopic Techniques". J Drug Metab Toxicol. 2016; 7: e129.

21. Heidari A. "Novel and Stable Modifications of Intelligent Cadmium Oxide (CdO) Nanoparticles as Anti-Cancer Drug in Formation of Nucleic Acids Complexes for Human Cancer Cells' Treatment". Biochem Pharmacol (Los Angel). 2016; 5: 207.

22. Heidari A. "A Combined Computational and QM/MM Molecular Dynamics Study on Boron Nitride Nanotubes (BNNTs), Amorphous Boron Nitride Nanotubes (a-BNNTs) and Hexagonal Boron Nitride Nanotubes (h-BNNTs) as Hydrogen Storage". Struct Chem Crystallogr Commun. 2016; 2: 1.

23. Heidari A, "Pharmaceutical and Analytical Chemistry Study of Cadmium Oxide (CdO) Nanoparticles Synthesis Methods and Properties as Anti-Cancer Drug and its Effect on Human Cancer Cells", Pharm Anal Chem Open Access. 2016; 2: 113.

24. Heidari A. "A Chemotherapeutic and Biospectroscopic Investigation of the Interaction of Double-Standard DNA/RNA-Binding Molecules with Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh2O3) Nanoparticles as Anti-Cancer Drugs for Cancer Cells' Treatment", Chemo Open Access. 2016; 5: e129.

25. Heidari A. "Pharmacokinetics and Experimental Therapeutic Study of DNA and Other Biomolecules Using Lasers: Advantages and Applications", J Pharmacokinet Exp Ther. 2016; 1: e005.

26. Heidari A. "Determination of Ratio and Stability Constant of DNA/RNA in Human Cancer Cells and Cadmium Oxide (CdO) Nanoparticles Complexes Using Analytical Electrochemical and Spectroscopic Techniques". Insights Anal Electrochem. 2016; 2: 1.

27. Heidari A, "Discriminate between Antibacterial and Non-Antibacterial Drugs Artificial Neutral Networks of a Multilayer Perceptron (MLP) Type Using a Set of Topological Descriptors". J Heavy Met Toxicity Dis. 2016; 1: 2.

28. Heidari A. "Combined Theoretical and Computational Study of the Belousov-Zhabotinsky Chaotic Reaction and Curtius Rearrangement for Synthesis of Mechlorethamine, Cisplatin, Streptozotocin, Cyclophosphamide, Melphalan, Busulphan and BCNU as Anti-Cancer Drugs". Insights Med Phys. 2016; 1: 2.

29. Heidari A. "A Translational Biomedical Approach to Structural Arrangement of Amino Acids' Complexes: A Combined Theoretical and Computational

Study", Transl Biomed. 2016; 7: 2.

30. Heidari A, "Ab Initio and Density Functional Theory (DFT) Studies of Dynamic NMR Shielding Tensors and Vibrational Frequencies of DNA/RNA and Cadmium Oxide (CdO) Nanoparticles Complexes in Human Cancer Cells". J Nanomedine Biotherapeutic Discov. 2016; 6: e144.

31. Heidari A. "Molecular Dynamics and Monte-Carlo Simulations for Replacement Sugars in Insulin Resistance, Obesity, LDL Cholesterol, Triglycerides, Metabolic Syndrome, Type 2 Diabetes and Cardiovascular Disease: A Glycobiological Study". J Glycobiol. 2016; 5: e111.

32. Heidari A. "Synthesis and Study of 5-[(Phenylsulfonyl)Amino. 2016.

33. Heidari A. "Nitrogen, Oxygen, Phosphorus and Sulphur Heterocyclic Anti-Cancer Nano Drugs Separation in the Supercritical Fluid of Ozone (O3) Using Soave-Redlich-Kwong (SRK) and Pang-Robinson (PR) Equations", Electronic J Biol. 2016; 12: 4.

34. Heidari A. "An Analytical and Computational Infrared Spectroscopic Review of Vibrational Modes in Nucleic Acids". Austin J Anal Pharm Chem. 2016; 3: 1058.

35. Heidari A, Brown C. "Phase, Composition and Morphology Study and Analysis of Os-Pd/HfC Nanocomposites". Nano Res Appl. 2016; 2: 1.

36. Heidari A, Brown C. "Vibrational Spectroscopic Study of Intensities and Shifts of Symmetric Vibration Modes of Ozone Diluted by Cumene". International Journal of Advanced Chemistry. 2016; 4: 5-9.

37. Heidari A. "Study of the Role of Anti-Cancer Molecules with Different Sizes for Decreasing Corresponding Bulk Tumor Multiple Organs or Tissues". Arch Can Res. 2016; 4: 2.

38. Heidari A. "Genomics and Proteomics Studies of Zolpidem, Necopidem, Alpidem, Saripidem, Miroprofen, Zolimidine, Olprinone and Abafungin as Anti-Tumor, Peptide Antibiotics, Antiviral and Central Nervous System (CNS) Drugs". J Data Mining Genomics & Proteomics. 2016; 7: e125.

39. Heidari A. "Pharmacogenomics and Pharmacoproteomics Studies of Phosphodiesterase-5 (PDE5) Inhibitors and Paclitaxel Albumin-Stabilized Nanoparticles as Sandwiched Anti-Cancer Nano Drugs between Two DNA/RNA Molecules of Human Cancer Cells". J Pharmacogenomics Pharmacoproteomics. 2016; 7: e153.

40. Heidari A. "Biotranslational Medical and Biospectroscopic Studies of Cadmium Oxide (CdO) Nanoparticles-DNA/RNA Straight and Cycle Chain Complexes as Potent Anti-Viral, Anti-Tumor and Anti-Microbial Drugs: A Clinical Approach", Transl Biomed. 2016; 7: 2.

41. Heidari A. "A Comparative Study on Simultaneous Determination and Separation of Adsorbed Cadmium Oxide (CdO) Nanoparticles on DNA/RNA of Human Cancer Cells Using Biospectroscopic Techniques and Dielectrophoresis (DEP) Method", Arch Can Res. 2016; 4: 2.

42. Heidari A. "Cheminformatics and System Chemistry of Cisplatin, Carboplatin, Nedaplatin, Oxaliplatin, Heptaplatin and Lobaplatin as Anti-Cancer Nano Drugs: A Combined Computational and Experimental Study". J Inform Data Min. 2016; 1: 3.

43. Heidari A, "Linear and Non-Linear Quantitative Structure-Anti-Cancer-Activity Relationship (QSACAR) Study of Hydrous Ruthenium (IV) Oxide (RuO2) Nanoparticles as Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) and Anti-Cancer Nano Drugs". J Integr Oncol. 2016; 5: e110.

44. Heidari A. "Synthesis, Characterization and Biospectroscopic Studies of Cadmium Oxide (CdO) Nanoparticles-Nucleic Acids Complexes Absence of Soluble Polymer as a Protective Agent Using Nucleic Acids Condensation and Solution Reduction Method". J Nanosci Curr Res. 2016; 1: e101.

45. Heidari A, "Coplanarity and Collinearity of 4'-Dinonyl-2,2'-Bithiazole in One Domain of Bleomycin and Pingyangmycin to be Responsible for Binding of Cadmium Oxide (CdO) Nanoparticles to DNA/RNA Bidentate Ligands as Anti-Tumor Nano Drug". Int J Drug Dev & Res. 2016; 8: 007-008.

46. Heidari A. "A Pharmacovigilance Study on Linear and Non-Linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) Models for the Prediction of Retention Time of Anti-Cancer Nano Drugs under Synchrotron Radiations". J Pharmacovigil. 2016; 4: e161.

47. Heidari A. "Nanotechnology in Preparation of Semipermeable Polymers". J Adv Chem Eng. 2016; 6: 157.

48. Heidari A. "A Gastrointestinal Study on Linear and Non-Linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) Models for Analysis 5-Aminosalicylates Nano Particles as Digestive System Nano Drugs under Synchrotron Radiations", J Gastrointest Dig Syst. 2016; 6: e119.

49. Heidari A. "DNA/RNA Fragmentation and Cytolysis in Human Cancer Cells Treated with Diphthamide Nano Particles Derivatives". Biomedical Data Mining. 2016; 5: e102.

50. Heidari A, "A Successful Strategy for the Prediction of Solubility in the Construction of Quantitative Structure-Activity Relationship (QSAR) and Quantitative Structure-Property Relationship (QSPR) under Synchrotron Radiations Using Genetic Function Approximation (GFA) Algorithm". J Mol Biol Biotechnol. 2016; 1: 1.

51. Heidari A. "Computational Study on Molecular Structures of C20, C60, C240, C540, C960, C2160 and C3840 Fullerene Nano Molecules under Synchrotron Radiations Using Fuzzy Logic". J Material Sci Eng. 2016; 5: 282.

52. Heidari A. "Graph Theoretical Analysis of Zigzag Polyhexamethylene Biguanide, Polyhexamethylene Adipamide, Polyhexamethylene Biguanide Gauze and Polyhexamethylene Biguanide Hydrochloride (PHMB) Boron Nitride Nanotubes (BNNTs), Amorphous Boron Nitride Nanotubes (a-BNNTs) and Hexagonal Boron Nitride Nanotubes (h-BNNTs)". J Appl Computat Math. 2016; 5: e143.

53. Heidari A. "The Impact of High Resolution Imaging on Diagnosis", Int J Clin Med Imaging. 2016; 3: 1000e101.

54. Heidari A. "A Comparative Study of Conformational Behavior of Isotretinoin (13-Cis Retinoic Acid) and Tretinoin (All-Trans Retinoic Acid (ATRA)) Nano Particles as Anti-Cancer Nano Drugs under Synchrotron Radiations Using Hartree-Fock (HF) and Density Functional Theory (DFT) Methods", Insights in Biomed. 2016; 1: 2.

55. Heidari A. "Advances in Logic, Operations and Computational Mathematics". J Appl Computat Math. 2016; 5: 5.

56. Heidari A. "Mathematical Equations in Predicting Physical Behavior". J Appl Computat Math. 2016; 5: 5.

57. Heidari A. "Chemotherapy a Last Resort for Cancer Treatment". Chemo Open Access. 2016; 5: 4.

58. Heidari A. "Separation and Pre-Concentration of Metal Cations-DNA/RNA Chelates Using Molecular Beam Mass Spectrometry with Tunable Vacuum Ultraviolet (VUV) Synchrotron Radiation and Various Analytical Methods". Mass Spectrom Purif Tech. 2016; 2: e101.

59. Heidari A. "Yoctosecond Quantitative Structure-Activity Relationship (QSAR) and Quantitative Structure-Property Relationship (QSPR) under Synchrotron Radiations Studies for Prediction of Solubility of Anti-Cancer Nano Drugs in Aqueous Solutions Using Genetic Function Approximation (GFA) Algorithm", Insight Pharm Res. 2016; 1: 1.

60. Heidari A. "Cancer Risk Prediction and Assessment in Human Cells under Synchrotron Radiations Using Quantitative Structure Activity Relationship (QSAR) and Quantitative Structure Properties Relationship (QSPR) Studies". Int J Clin Med Imaging. 2016; 3: 516.

61. Heidari A. "A Novel Approach to Biology". Electronic J Biol. 2016; 12: 4.

62. Heidari A. "Innovative Biomedical Equipment's for Diagnosis and Treatment". J Bioengineer & Biomedical Sci. 2016; 6: 2.

63. Heidari A. "Integrating Precision Cancer Medicine into Healthcare, Medicare Reimbursement Changes and the Practice of Oncology: Trends in Oncology Medicine and Practices". J Oncol Med & Pract. 2016; 1: 2.

64. Heidari A. "Promoting Convergence in Biomedical and Biomaterials Sciences and Silk Proteins for Biomedical and Biomaterials Applications: An Introduction to Materials in Medicine and Bioengineering Perspectives", J Bioengineer & Biomedical Sci. 2016; 6: 3.

65. Heidari A. "X-Ray Fluorescence and X-Ray Diffraction Analysis on Discrete Element Modeling of Nano Powder Metallurgy Processes in Optimal Container Design", J Powder Metall Min. 2017; 6: 1.

66. Heidari A. "Biomolecular Spectroscopy and Dynamics of Nano-Sized Molecules and Clusters as Cross-Linking-Induced Anti-Cancer and Immune-Oncology Nano Drugs Delivery in DNA/RNA of Human Cancer Cells' Membranes under Synchrotron Radiations: A Payload-Based Perspective". Arch Chem Res. 2017; 1: 2.

67. Heidari A. "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". J Appl Bioinforma Comput Biol. 2017; 6: 1.

68. Heidari A. "Electronic Coupling among the Five Nanomolecules Shuts Down Quantum Tunneling in the Presence and Absence of an Applied Magnetic Field for Indication of the Dimer or other Provide Different Influences on the Magnetic Behavior of Single Molecular Magnets (SMMs) as Qubits for Quantum Computing". Glob J Res Rev. 2017; 4: 2.

69. Heidari A. "Polymorphism in Nano-Sized Graphene Ligand-Induced Transformation of Au38-xAgx/xCux(SPh-tBu)24 to Au36-xAgx/xCux(SPh-tBu)24 (x = 1-12) Nanomolecules for Synthesis of Au144-xAgx/xCux[(SR)60, (SC4)60, (SC6)60, (SC12)60, (PET)60, (p-MBA)60, (F)60, (Cl)60, (Br)60, (I)60, (At)60, (Uus)60 and (SC6H13)60. 2017.

70. Heidari A. "Biomedical Resource Oncology and Data Mining to Enable Resource Discovery in Medical, Medicinal, Clinical, Pharmaceutical, Chemical and Translational Research and Their Applications in Cancer Research". Int J Biomed Data Min. 2017; 6: e103.

71. Heidari A. "Study of Synthesis, Pharmacokinetics, Pharmacodynamics, Dosing, Stability, Safety and Efficacy of Olympiadane Nanomolecules as Agent for Cancer Enzymotherapy, Immunotherapy, Chemotherapy, Radiotherapy, Hormone Therapy and Targeted Therapy under Synchrotorn Radiation". J Dev Drugs. 2017; 6: e154.

72. Heidari A. "A Novel Approach to Future Horizon of Top Seven Biomedical Research Topics to Watch in 2017: Alzheimer's, Ebola, Hypersomnia, Human Immunodeficiency Virus (HIV), Tuberculosis (TB), Microbiome/Antibiotic Resistance and Endovascular Stroke", J Bioengineer & Biomedical Sci. 2017; 7: e127.

73. Heidari A. "Opinion on Computational Fluid Dynamics (CFD) Technique". Fluid Mech Open Acc. 2017; 4: 157.

74. Heidari A. "Concurrent Diagnosis of Oncology Influence Outcomes in Emergency General Surgery for Colorectal Cancer and Multiple Sclerosis (MS) Treatment Using Magnetic Resonance Imaging (MRI) and Au329(SR)84, Au329-xAgx(SR)84, Au144(SR)60, Au68(SR)36, Au30(SR)18, Au102(SPh)44, Au38(SPh)24, Au38(SC2H4Ph)24, Au21S(SAdm)15, Au36(pMBA)24 and Au25(pMBA)18 Nano Clusters". J Surgery Emerg Med. 2017; 1: 21.

75. Heidari A. "Developmental Cell Biology in Adult Stem Cells Death and Autophagy to Trigger a Preventive Allergic Reaction to Common Airborne Allergens under Synchrotron Radiation Using Nanotechnology for Therapeutic Goals in Particular Allergy Shots (Immunotherapy)". Cell Biol (Henderson, NV). 2017; 6: 1.

76. Heidari A. "Changing Metal Powder Characteristics for Elimination of the Heavy Metals Toxicity and Diseases in Disruption of Extracellular Matrix (ECM) Proteins Adjustment in Cancer Metastases Induced by Osteosarcoma, Chondrosarcoma, Carcinoid, Carcinoma, Ewing's Sarcoma, Fibrosarcoma and Secondary Hematopoietic Solid or Soft Tissue Tumors". J Powder Metall Min. 2017; 6: 170.

77. Heidari A. "Nanomedicine-Based Combination Anti-Cancer Therapy between Nucleic Acids and Anti-Cancer Nano Drugs in Covalent Nano Drugs Delivery Systems for Selective Imaging and Treatment of Human Brain Tumors Using Hyaluronic Acid, Alguronic Acid and Sodium Hyaluronate as Anti-Cancer Nano Drugs and Nucleic Acids Delivery under Synchrotron Radiation". Am J Drug Deliv. 2017; 5: 2.

78. Heidari A. "Clinical Trials of Dendritic Cell Therapies for Cancer Exposing Vulnerabilities in Human Cancer Cells' Metabolism and Metabolomics: New Discoveries, Unique Features Inform New Therapeutic Opportunities, Biotech's Bumpy Road to the Market and Elucidating the Biochemical Programs that Support Cancer Initiation and Progression". J Biol Med Science. 2017; 1: e103.

79. Heidari A. "The Design Graphene-Based Nanosheets as a New Nanomaterial in Anti-Cancer Therapy and Delivery of Chemotherapeutics and Biological Nano Drugs for Liposomal Anti-Cancer Nano Drugs and Gene Delivery". Br Biomed Bull. 2017; 5: 305.

80. Haidari A. "Integrative Approach to Biological Networks for Emerging Roles of Proteomics, Genomics and Transcriptomics in the Discovery and Validation of Human Colorectal Cancer Biomarkers from DNA/RNA Sequencing Data under Synchrotron Radiation", Transcriptomics. 2017; 5: e117.

81. Heidari A. "Elimination of the Heavy Metals Toxicity and Diseases in Disruption of Extracellular Matrix (ECM) Proteins and Cell Adhesion Intelligent Nanomolecules Adjustment in Cancer Metastases Using Metalloenzymes and under Synchrotron Radiation", Lett Health Biol Sci. 2017; 2: 1-4.

82. Heidari A. "Treatment of Breast Cancer Brain Metastases through a Targeted Nanomolecule Drug Delivery System Based on Dopamine Functionalized Multi-Wall Carbon Nanotubes (MWCNTs) Coated with Nano Graphene Oxide (GO) and Protonated Polyaniline (PANI) in Situ During the Polymerization of Aniline Autogenic Nanoparticles for the Delivery of Anti-Cancer Nano Drugs under Synchrotron Radiation". Br J Res. 2017; 4: 16.

83. Heidari A. "Sedative, Analgesic and Ultrasound-Mediated Gastrointestinal Nano Drugs Delivery for Gastrointestinal Endoscopic Procedure, Nano Drug-Induced Gastrointestinal Disorders and Nano Drug Treatment of Gastric Acidity", Res Rep Gastroenterol. 2017; 1: 1.

84. Heidari A. "Synthesis, Pharmacokinetics, Pharmacodynamics, Dosing, Stability, Safety and Efficacy of Orphan Nano Drugs to Treat High Cholesterol and Related Conditions and to Prevent Cardiovascular Disease under Synchrotron Radiation". J Pharm Sci Emerg Drugs. 2017; 5: 1.

85. Heidari A. "Non-Linear Compact Proton Synchrotrons to Improve Human Cancer Cells and Tissues Treatments and Diagnostics through Particle Therapy Accelerators with Monochromatic Microbeams". J Cell Biol Mol Sci. 2017; 2: 1-5.

86. Heidari A. "Design of Targeted Metal Chelation Therapeutics Nanocapsules as Colloidal Carriers and Blood-Brain Barrier (BBB) Translocation to Targeted Deliver Anti-Cancer Nano Drugs into the Human Brain to Treat Alzheimer's Disease under Synchrotron Radiation". J Nanotechnol Material Sci. 2017; 4: 1-5.

87. Gobato R, Heidari A. "Calculations Using Quantum Chemistry for Inorganic Molecule Simulation BeLi2SeSi". Science Journal of Analytical Chemistry. 2017; 5: 76-85.

88. Heidari A. "Different High-Resolution Simulations of Medical, Medicinal, Clinical, Pharmaceutical and Therapeutics Oncology of Human Lung Cancer Translational Anti-Cancer Nano Drugs Delivery Treatment Process under Synchrotron and X-Ray Radiations". J Med Oncol. 2017: 1.

89. Heidari A. "A Modern Ethnomedicinal Technique for Transformation, Prevention and Treatment of Human Malignant Gliomas Tumors into Human Benign Gliomas Tumors under Synchrotron Radiation". Am J Ethnomed. 2017; 4: 10.

90. Heidari A. "Active Targeted Nanoparticles for Anti-Cancer Nano Drugs Delivery across the Blood-Brain Barrier for Human Brain Cancer Treatment, Multiple Sclerosis (MS) and Alzheimer's Diseases Using Chemical Modifications of Anti-Cancer Nano Drugs or Drug-Nanoparticles through Zika Virus (ZIKV) Nanocarriers under Synchrotron Radiation". J Med Chem Toxicol. 2017; 2: 1-5.

91. Heidari A. "Investigation of Medical, Medicinal, Clinical and Pharmaceutical Applications of Estradiol, Mestranol (Norlutin), Norethindrone (NET), Norethisterone Acetate (NETA), Norethisterone Enanthate (NETE) and Testosterone Nanoparticles as Biological Imaging, Cell Labeling, Anti-Microbial Agents and Anti-Cancer Nano Drugs in Nanomedicines Based Drug Delivery Systems for Anti-Cancer Targeting and Treatment". Parana Journal of Science and Education (PJSE). 2017; 3: 0-19.

92. Heidari A. "A Comparative Computational and Experimental Study on Different Vibrational Biospectroscopy Methods, Techniques and Applications for Human Cancer Cells in Tumor Tissues Simulation, Modeling, Research, Diagnosis and Treatment". Open J Anal Bioanal Chem. 2017; 1: 14-20.

93. Heidari A. "Combination of DNA/RNA Ligands and Linear/Non-Linear Visible-Synchrotron Radiation-Driven N-Doped Ordered Mesoporous Cadmium Oxide (CdO) Nanoparticles Photocatalysts Channels Resulted in an Interesting Synergistic Effect Enhancing Catalytic Anti-Cancer Activity". Enz Eng. 2017; 6: 1.

94. Heidari A. "Modern Approaches in Designing Ferritin, Ferritin Light Chain, Transferrin, Beta-2 Transferrin and Bacterioferritin-Based Anti-Cancer Nano Drugs Encapsulating Nanosphere as DNA-Binding Proteins from Starved Cells (DPS)". Mod Appro Drug Des. 2017; 1: 000504.

95. Heidari A. "Potency of Human Interferon β-1a and Human Interferon β-1b in Enzymotherapy, Immunotherapy, Chemotherapy, Radiotherapy, Hormone Therapy and Targeted Therapy of Encephalomyelitis Disseminate/Multiple Sclerosis (MS) and Hepatitis A, B, C, D, E, F and G Virus Enter and Targets Liver Cells". J Proteomics Enzymol. 2017; 6: 1.

96. Heidari A. "Transport Therapeutic Active Targeting of Human Brain Tumors Enable Anti-Cancer Nanodrugs Delivery across the Blood-Brain Barrier (BBB) to Treat Brain Diseases Using Nanoparticles and Nanocarriers under Synchrotron Radiation". J Pharm Pharmaceutics. 2017; 4: 1-5.

97. Heidari A, Brown C. "Combinatorial Therapeutic Approaches to DNA/RNA and Benzylpenicillin (Penicillin G), Fluoxetine Hydrochloride (Prozac and Sarafem), Propofol (Diprivan), Acetylsalicylic Acid (ASA) (Aspirin), Naproxen Sodium (Aleve and Naprosyn) and Dextromethamphetamine Nanocapsules with Surface Conjugated DNA/RNA to Targeted Nano Drugs for Enhanced Anti-Cancer Efficacy and Targeted Cancer Therapy Using Nano Drugs Delivery Systems". Ann Adv Chem. 2017; 1: 61-69.

98. Heidari A. "High-Resolution Simulations of Human Brain Cancer Translational Nano Drugs Delivery Treatment Process under Synchrotron Radiation". J Transl Res. 2017; 1: 1-3.

99. Heidari A. "Investigation of Anti-Cancer Nano Drugs' Effects' Trend on Human Pancreas Cancer Cells and Tissues Prevention, Diagnosis and Treatment Process under Synchrotron and X-Ray Radiations with the Passage of Time Using Mathematica", Current Trends Anal Bioanal Chem. 2017; 1: 36-41.

100. Heidari A. "Pros and Cons Controversy on Molecular Imaging and Dynamics of Double-Standard DNA/RNA of Human Preserving Stem Cells-Binding Nano Molecules with Androgens/Anabolic Steroids (AAS) or Testosterone Derivatives through Tracking of Helium-4 Nucleus (Alpha Particle) Using Synchrotron Radiation". Arch Biotechnol Biomed. 2017; 1: 67-100.

101. Heidari A. "Visualizing Metabolic Changes in Probing Human Cancer Cells and Tissues Metabolism Using Vivo 1H or Proton NMR, 13C NMR, 15N NMR and 31P NMR Spectroscopy and Self-Organizing Maps under Synchrotron Radiation". SOJ Mater Sci Eng. 2017; 5: 1-6.

102. Heidari A. "Cavity Ring-Down Spectroscopy (CRDS), Circular Dichroism Spectroscopy, Cold Vapour Atomic Fluorescence Spectroscopy and Correlation Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Enliven: Challenges Cancer Detect Ther. 2017; 4: e001.

103. Heidari A, "Laser Spectroscopy, Laser-Induced Breakdown Spectroscopy and Laser-Induced Plasma Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Int J Hepatol Gastroenterol. 2017; 3: 079-084.

104. Heidari A, "Time-Resolved Spectroscopy and Time-Stretch Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Enliven: Pharmacovigilance and Drug Safety. 2017; 4: e001.

105. Heidari A. "Overview of the Role of Vitamins in Reducing Negative Effect of Decapeptyl (Triptorelin Acetate or Pamoate Salts) on Prostate Cancer Cells and Tissues in Prostate Cancer Treatment Process through Transformation of Malignant Prostate Tumors into Benign Prostate Tumors under Synchrotron Radiation". Open J Anal Bioanal Chem. 2017; 1: 21-26.

106. Heidari A. "Electron Phenomenological Spectroscopy, Electron Paramagnetic Resonance (EPR) Spectroscopy and Electron Spin Resonance (ESR) Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Austin J Anal Pharm Chem. 2017; 4: 1091.

107. Heidari A. "Therapeutic Nanomedicine Different High-Resolution Experimental Images and Computational Simulations for Human Brain Cancer Cells and Tissues Using Nanocarriers Deliver DNA/RNA to Brain Tumors under Synchrotron Radiation with the Passage of Time Using Mathematica and MATLAB". Madridge J Nano Tech. Sci. 2017; 2: 77-83.

108. Heidari A. "A Consensus and Prospective Study on Restoring Cadmium Oxide (CdO) Nanoparticles Sensitivity in Recurrent Ovarian Cancer by Extending the Cadmium Oxide (CdO) Nanoparticles-Free Interval Using Synchrotron Radiation Therapy as Antibody-Drug Conjugate for the Treatment of Limited-Stage Small Cell Diverse Epithelial Cancers". Cancer Clin Res Rep. 2017; 1: e001.

109. Heidari A. "A Novel and Modern Experimental Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under White Synchrotron Radiation". Cancer Sci Res Open Access. 2017; 4: 1-8.

110. Heidari A. "Different High-Resolution Simulations of Medical, Medicinal, Clinical, Pharmaceutical and Therapeutics Oncology of Human Breast Cancer Translational Nano Drugs Delivery Treatment Process under Synchrotron and X-Ray Radiations". J Oral Cancer Res. 2017; 1: 12-17.

111. Heidari A. "Vibrational Decihertz (dHz), Centihertz (cHz), Millihertz (mHz), Microhertz (μHz), Nanohertz (nHz), Picohertz (pHz), Femtohertz (fHz), Attohertz (aHz), Zeptohertz (zHz) and Yoctohertz (yHz) Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". International Journal of Biomedicine. 2017; 7: 335-340.

112. Heidari A. "Force Spectroscopy and Fluorescence Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation", EC Cancer. 2017; 2: 239-246.

113. Heidari A. "Photoacoustic Spectroscopy, Photoemission Spectroscopy and Photothermal Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". BAOJ Cancer Res Ther. 2017; 3: 45-52.

114. Heidari A. "J-Spectroscopy, Exchange Spectroscopy (EXSY), Nucle¬ar Overhauser Effect Spectroscopy (NOESY) and Total Correlation Spectroscopy (TOCSY) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". EMS Eng Sci J. 2017; 1: 006-013.

115. Heidari A. "Neutron Spin Echo Spectroscopy and Spin Noise Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Int J Biopharm Sci. 2017; 1: 103-107.

116. Heidari A, "Vibrational Decahertz (daHz), Hectohertz (hHz), Kilohertz (kHz), Megahertz (MHz), Gigahertz (GHz), Terahertz (THz), Petahertz (PHz), Exahertz (EHz), Zettahertz (ZHz) and Yottahertz (YHz) Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Madridge J Anal Sci Instrum. 2017; 2: 41-46.

117. Heidari A. "Two-Dimensional Infrared Correlation Spectroscopy, Linear Two-Dimensional Infrared Spectroscopy and Non-Linear Two-Dimensional Infrared Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". J Mater Sci Nanotechnol. 2018; 6: 101.

118. Heidari A. "Fourier Transform Infrared (FTIR) Spectroscopy, Near-Infrared Spectroscopy (NIRS) and Mid-Infrared Spectroscopy (MIRS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". Int J Nanotechnol Nanomed. 2018; 3: 1-6.

119. Heidari A. "Infrared Photo Dissociation Spectroscopy and Infrared Correlation Table Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". Austin Pharmacol Pharm. 2018; 3: 1011.

120. Heidari A. "Novel and Transcendental Prevention, Diagnosis and Treatment Strategies for Investigation of Interaction among Human Blood Cancer Cells, Tissues, Tumors and Metastases with Synchrotron Radiation under Anti-Cancer Nano Drugs Delivery Efficacy Using MATLAB Modeling and Simulation". Madridge J Nov Drug Res. 2017; 1: 18-24.

121. Heidari A. "Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Open Access J Trans Med Res. 2018; 2: 00026-00032.

122. Gobato MR, Gobato R, Heidari A. "Planting of Jaboticaba Trees for Landscape Repair of Degraded Area". Landscape Architecture and Regional Planning. 2018; 3: 1-9.

123. Heidari A. "Fluorescence Spectroscopy, Phosphorescence Spectroscopy and Luminescence Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". SM J Clin. Med. Imaging. 2018; 4: 1018.

124. Heidari A, "Nuclear Inelastic Scattering Spectroscopy (NISS) and Nuclear Inelastic Absorption Spectroscopy (NIAS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Int J Pharm Sci. 2018; 2: 1-14.

125. Heidari A. "X-Ray Diffraction (XRD), Powder X-Ray Diffraction (PXRD) and Energy-Dispersive X-Ray Diffraction (EDXRD) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". J Oncol Res. 2018; 2: 1-14.

126. Heidari A. "Correlation Two-Dimensional Nuclear Magnetic Reso¬nance (NMR) (2D-NMR) (COSY) Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". EMS Can Sci. 2018; 1: 1-001.

127. Heidari A. "Thermal Spectroscopy, Photothermal Spectroscopy, Thermal Microspectroscopy, Photothermal Microspectroscopy, Thermal Macrospectroscopy and Photothermal Macrospectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". SM J Biometrics Biostat. 2018; 3: 1024.

128. Heidari A. "A Modern and Comprehensive Experimental Biospectroscopic Comparative Study on Human Common Cancers' Cells, Tissues and Tumors before and after Synchrotron Radiation Therapy". Open Acc J Oncol Med. 2018; 1.

129. Heidari A. "Heteronuclear Correlation Experiments such as Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC), Heteronuclear Multiple-Quantum Correlation Spectroscopy (HMQC) and Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Endocrinology and Thyroid Cancer Cells and Tissues under Synchrotron Radiation". J Endocrinol Thyroid Res. 2018; 3: 555603.

130. Heidari A, "Nuclear Resonance Vibrational Spectroscopy (NRVS), Nuclear Inelastic Scattering Spectroscopy (NISS), Nuclear Inelastic Absorption Spectroscopy (NIAS) and Nuclear Resonant Inelastic X-Ray Scattering Spectroscopy (NRIXSS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Int J Bioorg Chem Mol Biol. 2018; 6: 1-5.

131. Heidari A. "A Novel and Modern Experimental Approach to Vibrational Circular Dichroism Spectroscopy and Video Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under White and Monochromatic Synchrotron Radiation". Glob J Endocrinol Metab. 2018; 1: 000514-000519.

132. Heidari A, "Pros and Cons Controversy on Heteronuclear Correlation Experiments such as Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC), Heteronuclear Multiple-Quantum Correlation Spectroscopy (HMQC) and Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". EMS Pharma J. 2018; 1: 002-008.

133. Heidari A. "A Modern Comparative and Comprehensive Experimental Biospectroscopic Study on Different Types of Infrared Spectroscopy of Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". J Analyt Molecul Tech. 2018; 3: 8.

134. Heidari A. "Investigation of Cancer Types Using Synchrotron Technology for Proton Beam Therapy: An Experimental Biospectroscopic Comparative Study". European Modern Studies Journal. 2018; 2: 13-29.

135. Heidari A. "Saturated Spectroscopy and Unsaturated Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Imaging J Clin Medical Sci. 2018; 5: 001-007.

136. Heidari A. "Small-Angle Neutron Scattering (SANS) and Wide-Angle X-Ray Diffraction (WAXD) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Int J Bioorg Chem Mol Biol. 2018; 6: 1-6.

137. Heidari A. "Investigation of Bladder Cancer, Breast Cancer, Colorectal Cancer, Endometrial Cancer, Kidney Cancer, Leukemia, Liver, Lung Cancer, Melanoma, Non-Hodgkin Lymphoma, Pancreatic Cancer, Prostate Cancer, Thyroid Cancer and Non-Melanoma Skin Cancer Using Synchrotron Technology for Proton Beam Therapy: An Experimental Biospectroscopic Comparative Study". Ther Res Skin Dis. 2018; 1.

138. Heidari A. "Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) Spectroscopy, Micro-Attenuated Total Reflectance Fourier Transform Infrared (Micro-ATR-FTIR) Spectroscopy and Macro-Attenuated Total Reflectance Fourier Transform Infrared (Macro-ATR-FTIR) Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time", International Journal of Chemistry Papers. 2018; 2: 1-12.

139. Heidari A. "Mössbauer Spectroscopy, Mössbauer Emission Spectroscopy and 57Fe Mössbauer Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Acta Scientific Cancer Biology 2. 2018; 3: 17-20.

140. Heidari A. "Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". Organic & Medicinal Chem IJ. 2018; 6: 555676.

141. Heidari A. "Correlation Spectroscopy, Exclusive Correlation Spectroscopy and Total Correlation Spectroscopy Comparative Study on Malignant and Benign Human AIDS-Related Cancers Cells and Tissues with the Passage of Time under Synchrotron Radiation". Int J Bioanal Biomed. 2018; 2: 001-007.

142. Heidari A, "Biomedical Instrumentation and Applications of Biospectroscopic Methods and Techniques in Malignant and Benign Human Cancer Cells and Tissues Studies under Synchrotron Radiation and Anti-Cancer Nano Drugs Delivery". Am J Nanotechnol Nanomed. 2018; 1: 001-009.

143. Heidari A. "Vivo 1H or Proton NMR, 13C NMR, 15N NMR and 31P NMR Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", Ann Biomet Biostat. 2018; 1: 1001.

144. Heidari A. "Grazing-Incidence Small-Angle Neutron Scattering (GISANS) and Grazing-Incidence X-Ray Diffraction (GIXD) Comparative Study on Malignant and Benign Human Cancer Cells, Tissues and Tumors under Synchrotron Radiation", Ann Cardiovasc Surg. 2018; 1: 1006.

145. Heidari A. "Adsorption Isotherms and Kinetics of Multi-Walled Carbon Nanotubes (MWCNTs), Boron Nitride Nanotubes (BNNTs), Amorphous Boron Nitride Nanotubes (a-BNNTs) and Hexagonal Boron Nitride Nanotubes (h-BNNTs) for Eliminating Carcinoma, Sarcoma, Lymphoma, Leukemia, Germ Cell Tumor and Blastoma Cancer Cells and Tissues", Clin Med Rev Case Rep. 2018; 5: 201.

146. Heidari A. "Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Incredible Natural-Abundance Double-Quantum Transfer Experiment (INADEQUATE), Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC), Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC), Nuclear Overhauser Effect Spectroscopy (NOESY) and Rotating Frame Nuclear Overhauser Effect Spectroscopy (ROESY) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Acta Scientific Pharmaceutical Sciences. 2018; 5: 30-35.

147. Heidari A. "Small-Angle X-Ray Scattering (SAXS), Ultra-Small Angle X-Ray Scattering (USAXS), Fluctuation X-Ray Scattering (FXS), Wide-Angle X-Ray Scattering (WAXS), Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS), Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS), Small-Angle Neutron Scattering (SANS), Grazing-Incidence Small-Angle Neutron Scattering (GISANS), X-Ray Diffraction (XRD), Powder X-Ray Diffraction (PXRD), Wide-Angle X-Ray Diffraction (WAXD), Grazing-Incidence X-Ray Diffraction (GIXD) and Energy-Dispersive X-Ray Diffraction (EDXRD) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Oncol Res Rev. 2018; 1: 1-10.

148. Heidari A, "Pump-Probe Spectroscopy and Transient Grating Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation", Adv Material Sci Engg, Volume 2, Issue 1, Pages 1-7, 2018.

149. Heidari A, "Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS) and Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", Insights Pharmacol Pharm Sci 1 (1): 1-8, 2018.

150. Heidari A, "Acoustic Spectroscopy, Acoustic Resonance Spectroscopy and Auger Spectroscopy Comparative Study on Anti-Cancer Nano Drugs Delivery in Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Nanosci Technol. 2018; 5: 1-9.

151. Heidari A. "Niobium, Technetium, Ruthenium, Rhodium, Hafnium, Rhenium, Osmium and Iridium Ions Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Nanomed Nanotechnol. 2018; 3: 000138.

152. Heidari A. "Homonuclear Correlation Experiments such as Homonuclear Single-Quantum Correlation Spectroscopy (HSQC), Homonuclear Multiple-Quantum Correlation Spectroscopy (HMQC) and Homonuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", Austin J Proteomics Bioinform & Genomics. 2018; 5: 1024.

153. Heidari A. "Atomic Force Microscopy Based Infrared (AFM-IR) Spectroscopy and Nuclear Resonance Vibrational Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time", J Appl Biotechnol Bioeng. 2018; 5: 142-148.

154. Heidari A. "Time-Dependent Vibrational Spectral Analysis of Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". J Cancer Oncol. 2018; 2: 000124.

155. Heidari A. "Palauamine and Olympiadane Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Arc Org Inorg Chem Sci. 2018; 3.

156. Gobato R, Heidari A, "Infrared Spectrum and Sites of Action of Sanguinarine by Molecular Mechanics and ab initio Methods". International Journal of Atmospheric and Oceanic Sciences. 2018; 2: 1-9.

157. Heidari A. "Angelic Acid, Diabolic Acids, Draculin and Miraculin Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment Under Synchrotron and Synchrocyclotron Radiations". Med & Analy Chem Int J. 2018; 2: 000111.

158. Heidari A. "Gamma Linolenic Methyl Ester, 5-Heptadeca-5,8,11-Trienyl 1,3,4-Oxadiazole-2-Thiol, Sulphoquinovosyl Diacyl Glycerol, Ruscogenin, Nocturnoside B, Protodioscine B, Parquisoside-B, Leiocarposide, Narangenin, 7-Methoxy Hespertin, Lupeol, Rosemariquinone, Rosmanol and Rosemadiol Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Int J Pharma Anal Acta. 2018; 2: 7-14.

159. Heidari A, "Fourier Transform Infrared (FTIR) Spectroscopy, Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) Spectroscopy, Micro-Attenuated Total Reflectance Fourier Transform Infrared (Micro-ATR-FTIR) Spectroscopy, Macro-Attenuated Total Reflectance Fourier Transform Infrared (Macro-ATR-FTIR) Spectroscopy, Two-Dimensional Infrared Correlation Spectroscopy, Linear Two-Dimensional Infrared Spectroscopy, Non-Linear Two-Dimensional Infrared Spectroscopy, Atomic Force Microscopy Based Infrared (AFM-IR) Spectroscopy, Infrared Photodissociation Spectroscopy, Infrared Correlation Table Spectroscopy, Near-Infrared Spectroscopy (NIRS), Mid-Infrared Spectroscopy (MIRS), Nuclear Resonance Vibrational Spectroscopy, Thermal Infrared Spectroscopy and Photothermal Infrared Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time", Glob Imaging Insights. 2018; 3: 1-14.

160. Heidari A, "Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Cancer Cells, Tissues and Tumors under Synchrotron and Synchrocyclotron Radiations". Chronicle of Medicine and Surgery. 2018; 3: 144-156.

161. Heidari A, "Tetrakis [3, 5-bis (Trifluoromethyl) Phenyl. 2018.

162. Heidari A, "Sydnone, Münchnone, Montréalone, Mogone, Montelukast, Quebecol and Palau'amine-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules". Sur Cas Stud Op Acc J. 2018; 1.

163. Heidari A, "Fornacite, Orotic Acid, Rhamnetin, Sodium Ethyl Xanthate (SEX) and Spermine (Spermidine or Polyamine) Nanomolecules Incorporation into the Nanopolymeric Matrix (NPM)". International Journal of Biochemistry and Biomolecules. 2018; 4: 1-19.

164. Heidari A, Gobato R, "Putrescine, Cadaverine, Spermine and Spermidine-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules". Parana Journal of Science and Education (PJSE). 2018; 4: 1-14.

165. Heidari A. "Cadaverine (1,5-Pentanediamine or Pentamethylenediamine), Diethyl Azodicarboxylate (DEAD or DEADCAT) and Putrescine (Tetramethylenediamine) Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Hiv and Sexual Health Open Access Open Journal. 2018; 1: 4-11.

166. Heidari A. "Improving the Performance of Nano-Endofullerenes in Polyaniline Nanostructure-Based Biosensors by Covering Californium Colloidal Nanoparticles with Multi-Walled Carbon Nanotubes". Journal of Advances in Nanomaterials. 2018; 03: 1-28.

167. Gobato R, Heidari A. "Molecular Mechanics and Quantum Chemical Study on Sites of Action of Sanguinarine Using Vibrational Spectroscopy Based on Molecular Mechanics and Quantum Chemical Calculations". Malaysian Journal of Chemistry. 2018; 20: 1-23.

168. Heidari A, "Vibrational Biospectroscopic Studies on Anti-cancer Nanopharmaceuticals (Part I)", Malaysian Journal of Chemistry. 2018; 20: 33-73.

169. Heidari A. "Vibrational Biospectroscopic Studies on Anti-cancer Nanopharmaceuticals (Part II)". Malaysian Journal of Chemistry. 2018; 20: 74-117.

170. Heidari A. "Uranocene (U(C8H8)2) and Bis(Cyclooctatetraene)Iron (Fe(C8H8)2 or Fe(COT)2)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules". Chemistry Reports. 2018; 1: 1-16.

171. Heidari A. "Biomedical Systematic and Emerging Technological Study on Human Malignant and Benign Cancer Cells and Tissues Biospectroscopic Analysis under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-7.

172. Heidari A, "Deep-Level Transient Spectroscopy and X-Ray Photoelectron Spectroscopy (XPS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation." Res Dev Material Sci. 2018; 7.

173. Heidari A. "C70-Carboxyfullerenes Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Glob Imaging Insights. 2018; 3: 1-7.

174. Heidari A. "The Effect of Temperature on Cadmium Oxide (CdO) Nanoparticles Produced by Synchrotron Radiation in the Human Cancer Cells, Tissues and Tumors". International Journal of Advanced Chemistry. 2018; 6: 140-156.

175. Heidari A. "A Clinical and Molecular Pathology Investigation of Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Cancer Cells, Tissues and Tumors under Synchrotron and Synchrocyclotron Radiations Using Cyclotron versus Synchrotron, Synchrocyclotron and the Large Hadron Collider (LHC) for Delivery of Proton and Helium Ion (Charged Particle) Beams for Oncology Radiotherapy". European Journal of Advances in Engineering and Technology. 2018; 5: 414-426.

176. Heidari A. "Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". J Oncol Res. 2018; 1: 1-20.

177. Heidari A. "Use of Molecular Enzymes in the Treatment of Chronic Disorders". Canc Oncol Open Access J. 2018; 1: 12-15.

178. Heidari A. "Vibrational Biospectroscopic Study and Chemical Structure Analysis of Unsaturated Polyamides Nanoparticles as Anti-Cancer Polymeric Nanomedicines Using Synchrotron Radiation". International Journal of Advanced Chemistry. 2018; 6: 167-189.

179. Heidari A. "Adamantane, Irene, Naftazone and Pyridine-Enhanced Precatalyst Preparation Stabilization and Initiation (PEPPSI) Nano Molecules". Madridge J Nov Drug Res. 2018; 2: 61-67.

180. Heidari A. "Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Madridge J Nov Drug Res. 2018; 2: 68-74.

181. Heidari A, Gobato R. "A Novel Approach to Reduce Toxicities and to Improve Bioavailabilities of DNA/RNA of Human Cancer Cells-Containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ^9-Tetrahydrocannabinol (THC) [(-)-trans-Δ^9-Tetrahydrocannabinol. 2020.

182. Heidari A, Gobato R. "Ultraviolet Photoelectron Spectroscopy (UPS) and Ultraviolet-Visible (UV-Vis) Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Parana Journal of Science and Education. 2018; 4: 18-33.

183. Gobato R, Heidari A, Mitra A. "The Creation of C13H20BeLi2SeSi. The Proposal of a Bio-Inorganic Molecule, Using Ab Initio Methods for the Genesis of a Nano Membrane". Arc Org Inorg Chem Sci. 2018; 3: 000167.

184. Gobato R, Heidari A, Mitra A. "Using the Quantum Chemistry for Genesis of a Nano Biomembrane with a Combination of the Elements Be, Li, Se, Si, C and H". ResearchGate. 2018.

185. Gobato R, Heidari A. "Using the Quantum Chemistry for Genesis of a Nano Biomembrane with a Combination of the Elements Be, Li, Se, Si, C and H", J Nanomed Res. 2018; 7: 241-252.

186. Heidari A. "Bastadins and Bastaranes-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules". Glob Imaging Insights. 2018; 3: 1-7.

187. Heidari A. "Fucitol, Pterodactyladiene, DEAD or DEADCAT (DiEthyl AzoDiCArboxylaTe), Skatole, the NanoPutians, Thebacon, Pikachurin, Tie Fighter, Spermidine and Mirasorvone Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Glob Imaging Insights. 2018; 3: 1-8.

188. Dadvar E, Heidari A. "A Review on Separation Techniques of Graphene Oxide (GO)/Base on Hybrid Polymer Membranes for Eradication of Dyes and Oil Compounds: Recent Progress in Graphene Oxide (GO)/Base on Polymer Membranes-Related Nanotechnologies". Clin Med Rev Case Rep. 2018; 5: 228.

189. Heidari A, Gobato R. "First-Time Simulation of Deoxyuridine Monophosphate (dUMP) (Deoxyuridylic Acid or Deoxyuridylate) and Vomitoxin (Deoxynivalenol (DON)) ((3α,7α)-3,7,15-Trihydroxy-12,13-Epoxytrichothec-9-En-8-One)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations", Parana Journal of Science and Education. 2018; 4: 46-67.

190. Heidari A. "Buckminsterfullerene (Fullerene), Bullvalene, Dickite and Josiphos Ligands Nano Molecules Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Hematology and Thromboembolic Diseases Prevention, Diagnosis and Treatment under Synchrotron and Synchrocyclotron Radiations". Glob Imaging Insights. 2018; 3: 1-7.

191. Heidari A. "Fluctuation X-Ray Scattering (FXS) and Wide-Angle X-Ray Scattering (WAXS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-7.

192. Heidari A. "A Novel Approach to Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Incredible Natural-Abundance Double-Quantum Transfer Experiment (INADEQUATE), Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC), Heteronuclear Multiple-Bond Correlation Spectroscopy (HMBC), Nuclear Overhauser Effect Spectroscopy (NOESY) and Rotating Frame Nuclear Overhauser Effect Spectroscopy (ROESY) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-9.

193. Heidari A. "Terphenyl-Based Reversible Receptor with Rhodamine, Rhodamine-Based Molecular Probe, Rhodamine-Based Using the Spirolactam Ring Opening, Rhodamine B with Ferrocene Substituent, Calix. 2020.

194. Heidari A, "Small-Angle X-Ray Scattering (SAXS), Ultra-Small Angle X-Ray Scattering (USAXS), Fluctuation X-Ray Scattering (FXS), Wide-Angle X-Ray Scattering (WAXS), Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS), Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS), Small-Angle Neutron Scattering (SANS), Grazing-Incidence Small-Angle Neutron Scattering (GISANS), X-Ray Diffraction (XRD), Powder X-Ray Diffraction (PXRD), Wide-Angle X-Ray Diffraction (WAXD), Grazing- Incidence X-Ray Diffraction (GIXD) and Energy-Dispersive X-Ray Diffraction (EDXRD) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-10.

195. Heidari A. "Nuclear Resonant Inelastic X-Ray Scattering Spectroscopy (NRIXSS) and Nuclear Resonance Vibrational Spectroscopy (NRVS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-7.

196. Heidari A. "Small-Angle X-Ray Scattering (SAXS) and Ultra-Small Angle X-Ray Scattering (USAXS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-7.

197. Heidari A. "Curious Chloride (CmCl3) and Titanic Chloride (TiCl4)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules for Cancer Treatment and Cellular Therapeutics". J Cancer Research and Therapeutic Interventions. 2018; 1: 1-10.

198. Gobato R, Gobato MR, Heidari A, Mitra A. "Spectroscopy and Dipole Moment of the Molecule C13H20BeLi2SeSi via Quantum Chemistry Using Ab Initio, Hartree-Fock Method in the Base Set CC-pVTZ and 6-311G**(3df, 3pd)". Arc Org Inorg Chem Sci. 2018; 3: 402-409.

199. Heidari A. "C60 and C70-Encapsulating Carbon Nanotubes Incorporation into the Nano Polymeric Matrix (NPM) by Immersion of the Nano Polymeric Modified Electrode (NPME) as Molecular Enzymes and Drug Targets for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron and Synchrocyclotron Radiations". Integr Mol Med. 2018; 3: 1-8.

200. Heidari A. "Two-Dimensional (2D) 1H or Proton NMR, 13C NMR, 15N NMR and 31P NMR Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". Glob Imaging Insights. 2018; 3: 1-8.

201. Heidari A. "FT-Raman Spectroscopy, Coherent Anti-Stokes Raman Spectroscopy (CARS) and Raman Optical Activity Spectroscopy (ROAS) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-8.

202. Heidari A. "A Modern and Comprehensive Investigation of Inelastic Electron Tunneling Spectroscopy (IETS) and Scanning Tunneling Spectroscopy on Malignant and Benign Human Cancer Cells, Tissues and Tumors through Optimizing Synchrotron Microbeam Radiotherapy for Human Cancer Treatments and Diagnostics: An Experimental Biospectroscopic Comparative Study". Glob Imaging Insights. 2018; 3: 1-8.

203. Heidari A. "A Hypertension Approach to Thermal Infrared Spectroscopy and Photothermal Infrared Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time". Glob Imaging Insights. 2018; 3: 1-8.

204. Heidari A. "Incredible Natural-Abundance Double-Quantum Transfer Experiment (INADEQUATE), Nuclear Overhauser Effect Spectroscopy (NOESY) and Rotating Frame Nuclear Overhauser Effect Spectroscopy (ROESY) Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Glob Imaging Insights. 2018; 3: 1-8.

205. Heidari A. "2-Amino-9-((1S, 3R, 4R)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclopentyl)-1H-Purin-6(9H)-One, 2-Amino-9-((1R, 3R, 4R)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclopentyl)-1H-Purin-6(9H)-One, 2-Amino-9-((1R, 3R, 4S)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclopentyl)-1H-Purin-6(9H)-One and 2-Amino-9-((1S, 3R, 4S)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclopentyl)-1H-Purin-6(9H)-One-Enhanced Precatalyst Preparation Stabilization and Initiation Nano Molecules". Glob Imaging Insights. 2018; 3: 1-9.

206. Gobato R, Gobato MR, Heidari A, Mitra A. "Spectroscopy and Dipole Moment of the Molecule C13H20BeLi2SeSi via Quantum Chemistry Using Ab Initio, Hartree-Fock Method in the Base Set CC-pVTZ and 6-311G**(3df, 3pd)". American Journal of Quantum Chemistry and Molecular Spectroscopy. 2018; 2: 9-17.

207. Heidari A. "Production of Electrochemiluminescence (ECL) Biosensor Using Os-Pd/HfC Nanocomposites for Detecting and Tracking of Human Gastro-

enterological Cancer Cells, Tissues and Tumors". Int J Med Nano Res. 2018; 5: 1, 22-34.

208. Heidari A. "Enhancing the Raman Scattering for Diagnosis and Treatment of Human Cancer Cells, Tissues and Tumors Using Cadmium Oxide (CdO) Nanoparticles". J Toxicol Risk Assess. 2018; 4: 12-25.

209. Heidari A. "Human Malignant and Benign Human Cancer Cells and Tissues Biospectroscopic Analysis under Synchrotron Radiation Using Anti-Cancer Nano Drugs Delivery". Integr Mol Med. 2018; 5: 1-8.

210. Heidari A. "Analogous Nano Compounds of the Form M(C8H8)2 Exist for M = (Nd, Tb, Pu, Pa, Np, Th, and Yb)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules". Integr Mol Med. 2018; 5: 1-8.

211. Heidari A. "Hadron Spectroscopy, Baryon Spectroscopy and Meson Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation". Integr Mol Med. 2018; 5: 1-8.

212. Gobato R, Gobato MR, Heidari A. "Raman Spectroscopy Study of the Nano Molecule C13H20BeLi2SeSi Using ab initio and Hartree-Fock Methods in the Basis Set CC-pVTZ and 6-311G** (3df, 3pd)". International Journal of Advanced Engineering and Science. 2019; 7: 14-35.

213. Heidari A, Gobato R. "Evaluating the Effect of Anti-Cancer Nano Drugs Dosage and Reduced Leukemia and Polycythemia Vera Levels on Trend of the Human Blood and Bone Marrow Cancers under Synchrotron Radiation". Trends in Res. 2019; 2: 1-8.

214. Heidari A, Gobato R. "Assessing the Variety of Synchrotron, Synchrocyclotron and LASER Radiations and Their Roles and Applications in Human Cancer Cells, Tissues and Tumors Diagnosis and Treatment". Trends in Res. 2019; 2: 1-8.

215. Heidari A, Gobato R. "Pros and Cons Controversy on Malignant Human Cancer Cells, Tissues and Tumors Transformation Process to Benign Human Cancer Cells, Tissues and Tumors". Trends in Res, 2019; 2: 1-8.

216. Heidari A, Gobato R. "Three-Dimensional (3D) Simulations of Human Cancer Cells, Tissues and Tumors for Using in Human Cancer Cells, Tissues and Tumors Diagnosis and Treatment as a Powerful Tool in Human Cancer Cells, Tissues and Tumors Research and Anti-Cancer Nano Drugs Sensitivity and Delivery Area Discovery and Evaluation". Trends in Res. 2019; 2: 1-8.

217. Heidari A, Gobato R. "Investigation of Energy Production by Synchrotron, Synchrocyclotron and LASER Radiations in Human Cancer Cells, Tissues and Tumors and Evaluation of Their Effective on Human Cancer Cells, Tissues and Tumors Treatment Trend". Trends in Res. 2019; 2: 1-8.

218. Heidari A, Gobato R. "High-Resolution Mapping of DNA/RNA Hypermethylation and Hypomethylation Process in Human Cancer Cells, Tissues and Tumors under Synchrotron Radiation". Trends in Res. 2019; 2: 1-9.

219. Heidari A. "A Novel and Comprehensive Study on Manufacturing and Fabrication Nanoparticles Methods and Techniques for Processing Cadmium Oxide (CdO) Nanoparticles Colloidal Solution". Glob Imaging Insights. 2019; 4: 1-8.

220. Heidari A. "A Combined Experimental and Computational Study on the Catalytic Effect of Aluminum Nitride Nanocrystal (AlN) on the Polymerization of Benzene, Naphthalene, Anthracene, Phenanthrene, Chrysene and Tetracene". Glob Imaging Insights. 2019; 4: 1-8.

221. Heidari A. "Novel Experimental and Three-Dimensional (3D) Multiphysics Computational Framework of Michaelis-Menten Kinetics for Catalyst Processes Innovation, Characterization and Carrier Applications". Glob Imaging Insights. 2019; 4: 1-8.

222. Heidari A. "The Hydrolysis Constants of Copper (I) (Cu+) and Copper (II) (Cu2+) in Aqueous Solution as a Function of pH Using a Combination of pH Measurement and Biospectroscopic Methods and Techniques". Glob Imaging Insights. 2019; 4: 1-8.

223. Heidari A. "Vibrational Biospectroscopic Study of Ginormous Virus-Sized Macromolecule and Polypeptide Macromolecule as Mega Macromolecules Using Attenuated Total Reflectance-Fourier Transform Infrared (ATR-FTIR) Spectroscopy and Mathematica 11.3". Glob Imaging Insights. 2019; 4: 1-8.

224. Heidari A. "Three-Dimensional (3D) Imaging Spectroscopy of Carcinoma, Sarcoma, Leukemia, Lymphoma, Multiple Myeloma, Melanoma, Brain and Spinal Cord Tumors, Germ Cell Tumors, Neuroendocrine Tumors and Carcinoid Tumors under Synchrotron Radiation". Glob Imaging Insights. 2019; 4: 1-9.

225. Gobato R, Gobato MR, Heidari A. "Storm Vortex in the Center of Paraná State on June 6, 2017: A Case Study". Sumerianz Journal of Scientific Research. 2019; 2: 24-31.

226. Gobato R, Gobato MR, Heidari A. "Attenuated Total Reflection-Fourier Transform Infrared (ATR-FTIR) Spectroscopy Study of the Nano Molecule C13H-20BeLi2SeSi Using ab initio and Hartree-Fock Methods in the Basis Set RHF/CC-pVTZ and RHF/6-311G** (3df, 3pd): An Experimental Challenge to Chemists". Chemistry Reports. 2019; 2: 1-26.

227. Heidari A. "Three-Dimensional (3D) Imaging Spectroscopy of Carcinoma, Sarcoma, Leukemia, Lymphoma, Multiple Myeloma, Melanoma, Brain and Spinal Cord Tumors, Germ Cell Tumors, Neuroendocrine Tumors and Carcinoid Tumors under Synchrocyclotron Radiation". Res Adv Biomed Sci Technol. 2019; 1: 1-17.

228. Gobato R, Gobato MR, Heidari A, Mitra A. "New Nano-Molecule Kurumi-C13H20BeLi2SeSi/C13H19BeLi2SeSi, and Raman Spectroscopy Using ab initio, Hartree-Fock Method in the Base Set CC-pVTZ and 6-311G** (3df, 3pd)". J Anal Pharm Res. 2019; 8: 1-6.

229. Heidari A, Esposito J, Caissutti A. "The Importance of Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) and Raman Bio spectroscopy of Single-Walled Carbon Nanotubes (SWCNT) and Multi-Walled Carbon Nanotubes (MWCNT) in Interpreting Infrared and Raman Spectra of Human Cancer Cells, Tissues and Tumors". Oncogen. 2019; 2: 1-21.

230. Heidari A. "Mechanism of Action and Their Side Effects at a Glance Prevention, Treatment and Management of Immune System and Human Cancer Nano Chemotherapy". Nanosci Technol. 2019; 6: 1-4.

231. Heidari A, Esposito J, Caissutti A. "The Quantum Entanglement Dynamics Induced by Non-Linear Interaction between a Moving Nano Molecule and a Two-Mode Field with Two-Photon Transitions Using Reduced Von Neumann Entropy and Jaynes-Cummings Model for Human Cancer Cells, Tissues and Tumors Diagnosis". Int J Crit Care Emerg Med. 2019; 5: 71-84.

232. Heidari A, Esposito J, Caissutti A. "Palytoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". J Pharm Drug Res. 2019; 3: 150-170.

233. Heidari A, Esposito J, Caissutti A. "Aplysiatoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". J Chem Sci Eng. 2019; 2: 70-89.

234. Gobato R, Gobato MR, Heidari A, Mitra A. "Spectroscopy and Dipole Moment of the Molecule C13H20BeLi2SeSi via Quantum Chemistry Using Ab initio, Hartree-Fock Method in the Base Set CC-pVTZ and 6-311G** (3df, 3pd)". American Journal of Quantum Chemistry and Molecular Spectroscopy. 2018; 2: 9-17.

235. Heidari A, Esposito J, Caissutti A. "Cyanotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Br J Med Health Res. 2019; 6: 21-60.

236. Heidari A. "Potential and Theranostics Applications of Novel Anti-Cancer Nano Drugs Delivery Systems in Preparing for Clinical Trials of Synchrotron Microbeam Radiation Therapy (SMRT) and Synchrotron Stereotactic Radiotherapy (SSRT) for Treatment of Human Cancer Cells, Tissues and Tumors Using Image Guided Synchrotron Radiotherapy (IGSR)". Ann Nanosci Nanotechnol. 2019; 3: 1006-1019.

237. Heidari A, Esposito J, Caissutti A. "Study of Anti-Cancer Properties of Thin Layers of Cadmium Oxide (CdO) Nanostructure". Int J Analyt Bioanalyt Methods. 2019; 1: 3-22.

238. Heidari A, Esposito J, Caissutti A. "Alpha-Conotoxin, Omega-Conotoxin and Mu-Conotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". International Journal of Advanced Chemistry. 2019; 7: 52-66.

239. Heidari A. "Clinical and Medical Pros and Cons of Human Cancer Cells' Enzymotherapy, Immunotherapy, Chemotherapy, Radiotherapy, Hormone Therapy and Targeted Therapy Process under Synchrotron Radiation: A Case Study on Mechanism of Action and Their Side Effects". Parana Journal of Science and Education (PJSE). 2019; 5: 1-23.

240. Heidari A. "The Importance of the Power in CMOS Inverter Circuit of Synchrotron and Synchrocyclotron Radiations Using 50 (nm) and 100 (nm) Technologies and Reducing the Voltage of Power Supply". Radiother Oncol Int. 2019; 1: 1002-1015.

241. Heidari A, Esposito J, Caissutti A. "The Importance of Quantum Hydrodynamics (QHD) Approach to Single-Walled Carbon Nanotubes (SWCNT) and Multi-Walled Carbon Nanotubes (MWCNT) in Genetic Science". SCIOL Genet Sci. 2019; 2: 113-129.

242. Heidari A, Esposito J, Caissutti A. "Anatoxin-a and Anatoxin-a(s) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Saudi J Biomed Res. 2019; 4: 174-194.

243. Gobato R, Gobato MR, Heidari A. "Evidence of Tornado Storm Hit the Counties of Rio Branco do Ivaí and Rosario de Ivaí, Southern Brazil", Sci Lett. 2019; 7: 32-40.

244. Jeyaraj M, Mahalingam V, Indhuleka A, Sennu P, Ho MS, et al. "Chemical Analysis of Surface Water Quality of River Noyyal Connected Tank in Tirupur District, Tamil Nadu, India". Water and Energy International. 2019; 62: 63-68.

245. Heidari A, Esposito J, Caissutti A. "6-Methoxy-8-[[6-Methoxy-8-[[6-Methoxy-2-Methyl-1-(2-Methylpropyl)-3,4- Dihydro-1H-Isoquinolin-7-yl. 2020.

246. Heidari A, Esposito J, Caissutti A. "Shiga Toxin and Shiga-Like Toxin (SLT) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Annal Biostat & Biomed Appli. 2019; 2: 1-4.

247. Heidari A, Esposito J, Caissutti A. "Alpha-Bungarotoxin, Beta-Bungarotoxin and Kappa-Bungarotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Archives of Pharmacology and Pharmaceutical Sciences, ReDelve. 2019; 1: 1-24.

248. Heidari A, Esposito J, Caissutti A. "Okadaic Acid Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Int J Analyt Bioanalyt Methods. 2019; 1: 1-19.

249. Heidari A. "Investigation of the Processes of Absorption, Distribution, Metabolism and Elimination (ADME) as Vital and Important Factors for Modulating Drug Action and Toxicity". Open Access J Oncol. 2019; 2: 180010-180012.

250. Heidari A, Esposito J, Caissutti A. "Pertussis Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Chemistry Reports. 2019; 1: 1-5.

251. Gobato R, Gobato MR, Heidari A. "Rhodochrosite as Crystal Oscillator". Am J Biomed Sci & Res. 2019; 3: 187.

252. Heidari A, Esposito J, Caissutti A. "Tetrodotoxin (TTX) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Journal of New Developments in Chemistry. 2019; 2: 26-48.

253. Heidari A, Esposito J, Caissutti A. "The Importance of Analysis of Vibronic-Mode Coupling Structure in Vibrational Spectra of Supramolecular Aggregates of (CA*M) Cyanuric Acid (CA) and Melamine (M) beyond the Franck-Condon Approximation". Journal of Clinical and Medical Images. 2019; 2: 1-20.

254. Heidari A, Esposito J, Caissutti A. "Microcystin-LR Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Malaysian Journal of Chemistry. 2019; 21: 70-95.

255. Heidari A, Esposito J, Caissutti A. "Botulinum Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Journal of Mechanical Design and Vibration. 2019; 7: 1-15.

256. Heidari A, Esposito J, Caissutti A. "Domoic Acid (DA) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Clinical Oncology Journal 1. 2019; 2: 3-7.

257. Heidari A, Esposito J, Caissutti A. "Surugatoxin (SGTX) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Clinical Oncology Journal 1. 2019; 2: 14-18.

258. Heidari A, Esposito J, Caissutti A. "Decarbamoylsaxitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Clinical Oncology Journal 1. 2019; 2: 19-23.

259. Heidari A, Esposito J, Caissutti A. "Gonyautoxin (GTX) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Clinical Oncology Journal 1. 2019; 2: 24-28.

260. Heidari A, Esposito J, Caissutti A. "Hislrionicotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 1: 01-06.

261. Heidari A, Esposito J, Caissutti A. "Dihydrokainic Acid Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 1: 07-12.

262. Heidari A, Esposito J, Caissutti A. "Aflatoxin B1 (AFB1), B2 (AFB2), G1 (AFG1), G2 (AFG2), M1 (AFM1), M2 (AFM2), Q1 (AFQ1) and P1 (AFP1) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 1: 25-32.

263. Heidari A, Esposito J, Caissutti A. "Mycotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 1: 13-18.

264. Heidari A, Esposito J, Caissutti A. "Bufotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 1: 19-24.

265. Heidari A, Esposito J, Caissutti A. "Kainic Acid (Kainite) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Journal of Neurology 1. 2019; 2: 2-7.

266. Heidari A, Esposito J, Caissutti A. "Nereistoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Journal of Neurology 1. 2019; 2: 19-24.

267. Heidari A, Esposito J, Caissutti A. "Spider Toxin and Raventoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Parana Journal of Science and Education. 2019; 5: 1-28.

268. Heidari A, Esposito J, Caissutti A. "Ochratoxin A, Ochratoxin B, Ochratoxin C, Ochratoxin α and Ochratoxin TA Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 2: 3-10.

269. Heidari A, Esposito J, Caissutti A. "Brevetoxin A and B Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 2: 11-16.

270. Heidari A, Esposito J, Caissutti A. "Lyngbyatoxin-a Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Drug Delivery Research 1. 2019; 2: 23-28.

271. Heidari A, Esposito J, Caissutti A. "Balraechotoxin (BTX) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Cientific Journal of Neurology 1. 2019; 3: 1-05.

272. Heidari A, Esposito J, Caissutti A. "Hanatoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Int J Pharm Sci Rev Res. 2019; 57: 21-32.

273. Heidari A, Esposito J, Caissutti A. "Neurotoxin and Alpha-Neurotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". J Biomed Sci & Res. 2019; 3: 550-563.

274. Heidari A, Esposito J, Caissutti A. "Antillatoxin (ATX) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure", American Journal of Optics and Photonics. 2019; 7: 18-27.

275. Gobato R, Gobato MR, Heidari A. "Calculation by UFF Method of Frequencies and Vibrational Temperatures of the Unit Cell of the Rhodochrosite Crystal". International Journal of Advanced Chemistry. 2019; 7: 77-81.

276. Heidari A, Esposito J, Caissutti A. "Analysis of Vibronic-Mode Coupling Structure in Vibrational Spectra of Fuzeon as a 36 Amino Acid Peptide for HIV Therapy beyond the Multi-Dimensional Franck-Condon Integrals Approximation". International Journal of Advanced Chemistry. 2019; 7: 82-96.

277. Heidari A, Esposito J, Caissutti A. "Debromoaplysiatoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Applied Chemistry. 2019; 2: 17-54.

278. Heidari A, Esposito J, Caissutti A. "Enterotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". JRL J Sci Technol. 2019; 1: 1-16.

279. Gobato R, Gobato MR, Heidari A, Mitra A. "Rhodochrosite Optical Indicatrix". Peer Res Nest. 2019; 1: 1-2.

280. Heidari A, Esposito J, Caissutti A. "Anthrax Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Research & Reviews: Journal of Computational Biology. 2019; 8: 23-51.

281. Heidari A, Esposito J, Caissutti A. "Kalkitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Can J Biomed Res & Tech. 2019; 2: 1-21.

282. Heidari A, Esposito J, Caissutti A. "Neosaxitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Clin Case Studie Rep. 2019; 2: 1-14.

283. Heidari A, Esposito J, Caissutti A, "6-Methoxy-8-[[6-Methoxy-8-[[6-Methoxy-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl. 2021.

284. Heidari A. "Comparison of Synchrotron Radiation and Synchrocyclotron Radiation Performance in Monitoring of Human Cancer Cells, Tissues and Tumors". Clin Case Studie Rep. 2019; 2: 1-12.

285. Heidari A, Esposito J, Caissutti A. "Kalkitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Clin Case Studie Rep. 2019; 2: 1-14.

286. Heidari A, Esposito J, Caissutti A. "Diphtheria Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis: A Spectroscopic Study on an Anti-Cancer Drug". Clin Case Studie Rep. 2019; 2: 1-14.

287. Heidari A, Esposito J, Caissutti A. "Symbiodinolide Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Clin Case Studie Rep. 2019; 2: 1-14.

288. Heidari A, Esposito J, Caissutti A. "Saxitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Am J Exp Clin Res. 2019; 6: 364-377.

289. Gobato R, Gobato MR, Heidari A, Mitra A. "Hartree-Fock Methods Analysis Protonated Rhodochrosite Crystal and Potential in the Elimination of Cancer Cells through Synchrotron Radiation". 2019; 5: 27-36.

290. Gobato R, Dosh IKK, Heidari A, Mitra A, Gobato MR. "Perspectives on the Elimination of Cancer Cells Using Rhodochrosite Crystal Through Synchrotron

Radiation, and Absorption the Tumoral and Non-Tumoral Tissues". Arch Biomed Eng & Biotechnol. 2019; 3: 1-2.

291. Gobato R, Gobato MR, Heidari A, Mitra A. "Unrestricted Hartree-Fock Computational Simulation in a Protonated Rhodochrosite Crystal". Phys Astron Int J. 2019; 3: 220-228.

292. Heidari A, Schmitt K, Henderson M, Besana E. "Perspectives on Sub-Nanometer Level of Electronic Structure of the Synchrotron with Mendelevium Nanoparticles for Elimination of Human Cancer Cells, Tissues and Tumors Treatment Using Mathematica 12.0". Journal of Energy Conservation. 2019; 1: 46-73.

293. Heidari A, Schmitt K, Henderson M, Besana E. "Simulation of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Bohrium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". Current Research in Biochemistry and Molecular Biology. 2019; 1: 17-44.

294. Heidari A, Schmitt K, Henderson M, Besana E. "Investigation of Interaction between Synchrotron Radiation and Thulium Nanoparticles for Human Cancer Cells, Tissues and Tumors Treatment". European Journal of Scientific Exploration. 2019; 2: 1-8.

295. Heidari A, Schmitt K, Henderson M, Besana E. "The Effectiveness of the Treatment Human Cancer Cells, Tissues and Tumors Using Darmstadtium Nanoparticles and Synchrotron Radiation". International Journal of Advanced Engineering and Science. 2020; 9: 9-39.

296. Heidari A, Schmitt K, Henderson M, Besana E. "Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment in Simulation of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Uranium Nanoparticles". Nano Prog. 2019; 1: 1-6.

297. Heidari A, Schmitt K, Henderson M, Besana E. "A New Approach to Interaction between Beam Energy and Erbium Nanoparticles". Saudi J Biomed Res. 2019; 4: 372-396.

298. Heidari A, Schmitt K, Henderson M, Besana E. "Consideration of Energy Functions and Wave Functions of the Synchrotron Radiation and Samarium Nanoparticles Interaction During Human Cancer Cells, Tissues and Tumors Treatment Process". Sci Int (Lahore). 2019; 31: 885-908.

299. Heidari A, Schmitt K, Henderson M, Besana E. "An Outlook on Optothermal Human Cancer Cells, Tissues and Tumors Treatment Using Lanthanum Nanoparticles under Synchrotron Radiation". Journal of Materials Physics and Chemistry. 2019; 7: 29-45.

300. Heidari A, Schmitt K, Henderson M, Besana E. "Effectiveness of Einsteinium Nanoparticles in Optothermal Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Journal of Analytical Oncology. 2019; 8: 43-62.

301. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Relation between Synchrotron Radiation and Dubnium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment Process". Int Res J Applied Sci. 2019; 1: 1-20.

302. Heidari A, Schmitt K, Henderson M, Besana E. "A Novel Prospect on Interaction of Synchrotron Radiation Emission and Europium Nanoparticles for Human Cancer Cells, Tissues and Tumors Treatment". European Modern Studies Journal. 2019; 3: 11-24.

303. Heidari A, Schmitt K, Henderson M, Besana E. "Advantages, Effectiveness and Efficiency of Using Neodymium Nanoparticles by 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". International Journal of Advanced Chemistry. 2019; 7: 119-135.

304. Heidari A, Schmitt K, Henderson M, Besana E. "Role and Applications of Promethium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment". Scientific Modelling and Research. 2019; 4: 8-14.

305. Heidari A, Esposito J, Caissutti A. "Maitotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis: A Spectroscopic Study on an Anti-Cancer Drug". Glob Imaging Insights. 2019; 4: 1-13.

306. Heidari A, Esposito J, Caissutti A. "Biotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Glob Imaging Insights. 2019; 4: 1-14.

307. Heidari A, Esposito J, Caissutti A. "Time-Resolved Resonance FT-IR and Raman Spectroscopy and Density Functional Theory Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra of Nanopolypeptide Macromolecule beyond the Multi-Dimensional Franck-Condon Integrals Approximation and Density Matrix Method". Glob Imaging Insights. 2019; 4: 1-14.

308. Heidari A, Esposito J, Caissutti A. "Cholera Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Glob Imaging Insights. 2019; 4: 1-14.

309. Heidari A, Esposito J, Caissutti A. "Nodularin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Glob Imaging Insights. 2019; 4: 1-14.

310. Heidari A, Esposito J, Caissutti A. "Cangitoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Glob Imaging Insights. 2019; 4: 1-13.

311. Heidari A, Esposito J, Caissutti A. "Ciguatoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Glob Imaging Insights. 2019; 4: 1-14.

312. Heidari A, Esposito J, Caissutti A. "Brevetoxin (a) and (b) Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis: A Spectroscopic Study on an Anti-HIV Drug". Cientific Drug Delivery Research. 2019; 1: 11-16.

313. Heidari A, Esposito J, Caissutti A. "Cobrotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Trends in Res. 2019; 3: 1-13.

314. Heidari A, Esposito J, Caissutti A. "Cylindrospermopsin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Trends in Res. 2019; 3: 1-14.

315. Heidari A, Esposito J, Caissutti A. "Anthrax Toxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis". Trends in Res. 2019; 3: 1-14.

316. Heidari A, Schmitt K, Henderson M, Besana E. "Investigation of Moscovium Nanoparticles as Anti-Cancer Nano Drugs for Human Cancer Cells, Tissues and Tumors Treatment". Elixir Appl Chem. 2019; 137A: 53943-53963.

317. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Function of the Beam Energy and Holmium Nanoparticles Using 3D Finite Element Method

(FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". European Journal of Advances in Engineering and Technology. 2019; 6: 34-62.

318. Heidari A, Schmitt K, Henderson M, Besana E. "Human Cancer Cells, Tissues and Tumors Treatment Using Dysprosium Nanoparticles". Asian J Mat Chem. 2019; 4: 47-51.

319. Heidari A, Schmitt K, Henderson M, Besana E. "Simulation of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Plutonium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". J Cancer Research and Cellular Therapeutics. 2019; 2: 1-19.

320. Heidari A, Schmitt K, Henderson M, Besana E, "Study of Gadolinium Nanoparticles Delivery Effect on Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Applied Chemistry. 2019; 2: 55-97.

321. Heidari A, Schmitt K, Henderson M, Besana E, Gobato R. "Pros and Cons of Livermorium Nanoparticles for Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation Using Mathematica 12.0". Parana Journal of Science and Education (PJSE). 2020; 6: 1-31.

322. Gobato R, Gobato MR, Heidari A, Mitra A. "Challenging Giants. Hartree-Fock Methods Analysis Protonated Rhodochrosite Crystal and Potential in the Elimination of Cancer Cells Through Synchrotron Radiation". Biomed J Sci & Tech Res. 2020; 25: 18843-18848.

323. Heidari A, Schmitt K, Henderson M, Besana E. "Simulation of Interaction between Ytterbium Nanoparticles and Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

324. Heidari A, Schmitt K, Henderson M, Besana E. "Modelling of Interaction between Curium Nanoparticles and Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation", Dent Oral Maxillofac Res. 2019; 5: 1-18.

325. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Berkelium Nanoparticles Delivery Effectiveness and Efficiency on Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

326. Heidari A, Schmitt K, Henderson M, Besana E. "Fermium Nanoparticles Delivery Mechanism in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-17.

327. Heidari A, Schmitt K, Henderson M, Besana E. "Advantages of Lawrencium Nanoparticles for Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

328. Heidari A, Schmitt K, Henderson M, Besana E. "Pros and Cons of the Roentgenium Nanoparticles for Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-17.

329. Heidari A, Schmitt K, Henderson M, Besana E, "Imagery of Flerovium Nanoparticles Delivery Process in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

330. Heidari A, Esposito J, Caissutti A. "Maitotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis: A Spectroscopic Study on an Anti-Gum Cancer Drug". Dent Oral Maxillofac Res. 2019; 5: 1-16.

331. Heidari A, Esposito J, Caissutti A. "Batrachotoxin Time-Resolved Absorption and Resonance FT-IR and Raman Biospectroscopy and Density Functional Theory (DFT) Investigation of Vibronic-Mode Coupling Structure in Vibrational Spectra Analysis: A Spectroscopic Study on an Anti-Gum Cancer Drug". Dent Oral Maxillofac Res. 2019; 5: 1-16.

332. Heidari A, Schmitt K, Henderson M, Besana E. "Hafnium Nanoparticles and Their Roles and Applications in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-17.

333. Heidari A, Schmitt K, Henderson M, Besana E. "Dramaturgy of Technetium Nanoparticles Delivery Process in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-19.

334. Heidari A, Schmitt K, Henderson M, Besana E. "Computational Approach to Interaction between Synchrotron Radiation Emission as a Function of the Beam Energy and Ruthenium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment". Dent Oral Maxillofac Res. 2019; 5: 1-18.

335. Heidari A, Schmitt K, Henderson M, Besana E. "Appearance Check of Rhodium Nanoparticles Delivery Trend in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-19.

336. Heidari A, Schmitt K, Henderson M, Besana E. "Orientation Rhenium Nanoparticles Delivery Target on Human Gum Cancer Cells, Tissues and Tumors under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

337. Heidari A, Schmitt K, Henderson M, Besana E. "Drug Delivery Systems (DDSs) of Osmium Nanoparticles on Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2019; 5: 1-18.

338. Heidari A, Schmitt K, Henderson M, Besana E. "Development of Successful Formulations for Oral Drug Delivery Concepts of Iridium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 5: 1-19.

339. Heidari A, Schmitt K, Henderson M, Besana E. "Classification of Drug Delivery System of Niobium Nanoparticles in Human Gum Cancer Gum Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-19.

340. Heidari A, Schmitt K, Henderson M, Besana E. "Types of Drug Delivery System Slideshare of Protactinium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-17.

341. Heidari A, Schmitt K, Henderson M, Besana E. "New Drug Delivery System in Pharmaceutics of Neptunium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-18.

342. Heidari A, Schmitt K, Henderson M, Besana E. "Drug Delivery Describes the Method and Approach to Delivering Drugs or Pharmaceuticals and Other Xenobiotics to Their Site of Action within Radon Nanoparticles Effects on Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-18.

343. Heidari A, Schmitt K, Henderson M, Besana E. "Applications of Oganesson Nanoparticles in Increasing Rapidly with the Promise of Targeted and Efficient Drug Delivery in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-19.

344. Heidari A, Schmitt K, Henderson M, Besana E. "Wheeler-Feynman Time- Symmetric Study of Effectiveness and Efficiency of Terbium Nanoparticles Delivery Mechanism in Human Cancer Cells, Tissues and Tumors under Synchrotron Radiation". Frontiers Drug Chemistry Clinical Res. 2020; 3: 1-13.

345. Heidari A, Schmitt K, Henderson M, Besana E. "Simulation of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Californium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". Oncol Res: Open Acce. 2019; 1: 1-17.

346. Heidari A. "Market Analysis of Glycobiology and Glycochemistry 2020". J Genet Disor Genet Rep. 2019; 8: 1.

347. Heidari A, Schmitt K, Henderson M, Besana E. "Synchrotron Radiation Emission as a Function of the Beam Energy and Thorium Nanoparticles". International Medicine. 2020; 2: 67-73.

348. Heidari A, Schmitt K, Henderson M, Besana E. "Stochastic Study of Relativistic Lutetium Nanoparticles Moving in a Quantum Field of Synchrotron Radiation Emission When Charged Lutetium Nanoparticles Are Accelerated Radially in Human Cancer Cells, Tissues and Tumors Treatment". Frontiers Drug Chemistry Clinical Res. 2020; 3: 1-15.

349. Heidari A, Caissutti A, Henderson M, Schmitt K, Besana E, et al. "Recent New Results and Achievements of California South University (CSU) BioSpectroscopy Core Research Laboratory for COVID-19 or 2019-nCoV Treatment: Diagnosis and Treatment Methodologies of "Coronavirus". Journal of Current Viruses and Treatment Methodologies. 2020; 1: 3-41.

350. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Human Cancer Cells, Tissues and Tumors Treatment Through Interaction Between Synchrotron Radiation and Cerium Nanoparticles". Sci Lett. 2020; 8: 7-17.

351. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Characteristic Polarization and the Frequencies Generated in Interaction of Synchrotron Radiation Emission and Actinium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment Process". Parana Journal of Science and Education (PJSE). 2020; 6: 13-47.

352. Heidari A, Schmitt K, Henderson M, Besana E. "Californium Nanoparticles and Human Cancer Treatment: Commemorating the 100th (1920-2020) Anniversary of the California South University (CSU)", Parana Journal of Science and Education (PJSE). 2020; 6: 48-83.

353. Heidari A, Schmitt K, Henderson M, Besana E. "A Chemical Review on Cancer Immunology and Immunodeficiency". International Journal of Advanced Chemistry. 2020; 8: 27-43.

354. Heidari A, Peterson V. "A Comprehensive Review on Functional Roles of Cancerous Immunoglobulins and Potential Applications in Cancer Immunodiagnostics and Immunotherapy". International Journal of Advanced Chemistry. 2020; 8: 44-58.

355. Heidari A, Peterson V. "An Encyclopedic Review on Stereotactic Hypofractionated Radiotherapy, Re-Irradiation, and Cancer Genome Research", International Journal of Advanced Chemistry. 2020; 8: 59-74.

356. Heidari A, Peterson V. "A Pervasive Review on Biomarker in Cervical Intraepithelial Lesions and Carcinoma", International Journal of Advanced Chemistry. 2020; 8: 75-88.

357. Heidari A, Schmitt K, Henderson M, Besana E. "Hereditary Immunity in Cancer". International Journal of Advanced Chemistry. 2020; 8: 94-110.

358. Gobato R, Gobato MR, Heidari A, Mitra A, Dosh IKK. "Secret Messages in Enigmatic Playful Texts". ABEB. 2020; 4: 1-10.

359. Heidari A, Gobato R, Gobato MR, Mitra A. "Hartree-Fock Methods Analysis Protonated Rhodochrosite Crystal and Potential in the Elimination of Cancer Cells through Synchrotron Radiation Using Small-Angle X-Ray Scattering (SAXS), Ultra-Small Angle X-Ray Scattering (USAXS), Fluctuation X-Ray Scattering (FXS), Wide-Angle X-Ray Scattering (WAXS), Grazing-Incidence Small-Angle X-Ray Scattering (GISAXS), Grazing-Incidence Wide-Angle X-Ray Scattering (GIWAXS) and Small-Angle Neutron Scattering (SANS)". 2020; 1: 1-8.

360. Heidari A, Gobato R, Dosh IKK, Mitra A, Gobato MR. "Single Layer Bioinorganic Membrane Using the Kurumi Molecule". AJAN. 2020; 1: 16-20.

361. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Pulsed Time Structure of Nobelium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment Process Which Covers from Microwaves to Hard X-Rays". Dent Oral Maxillofac Res. 2020; 6: 1-17.

362. Heidari A, Schmitt K, Henderson M, Besana E. "Abraham-Lorentz-Dirac Force Approach to Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Rutherfordium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". Dent Oral Maxillofac Res. 2020; 6: 1-17.

363. Heidari A, Schmitt K, Henderson M, Besana E. "Liénard-Wiechert Field Study of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Seaborgium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment", Dent Oral Maxillofac Res. 2020; 6: 1-17.

364. Heidari A, Schmitt K, Henderson M, Besana E. "Lorenz Gauge, Electric and Magnetic Fields Study of Interaction of Gravitationally Accelerating Ions through the Super Contorted 'Tubular' Polar Areas of Magnetic Fields and Hassium Nanoparticles". Dent Oral Maxillofac Res. 2020; 6: 1-18.

365. Heidari A, Schmitt K, Henderson M, Besana E. "Scalar Abraham-Lorentz- Dirac-Langevin Equation, Radiation Reaction and Vacuum Fluctuations Simulation of Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Tennessine Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". Dent Oral Maxillofac Res. 2020; 6: 1-17.

366. Heidari A, Schmitt K, Henderson M, Besana E. "The Dynamics and Quantum Mechanics of an Interaction of Synchrotron Radiation Emission as a Function of the Beam Energy and Meitnerium Nanoparticles Using 3D Finite Element Method (FEM) as an Optothermal Human Cancer Cells, Tissues and Tumors Treatment". Dent Oral Maxillofac Res. 2020; 6: 1-17.

367. Heidari A. "Future Advanced Study of Thin Layers of DNA/RNA Hybrid Molecule Nanostructure". J Mol Nanot Nanom. 2020; 2: 110-116.

368. Heidari A. "Study of Thin Layers of Cadmium Oxide (CdO) Nanostructure". Nano Prog. 2020; 2: 1-10.

369. Heidari A. "Effect of Solvent on Non-Linear Synchrotron Absorption of Multi- Walled Carbon Nanotubes (MWCNTs) with DNA/RNA Function". Sci Int (Lahore). 2020; 32: 291-315.

370. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Copernicium Nanoparticles Delivery Process in Human Cancer Cells, Tissues and Tumors Under Gravitationally Accelerating Ions Through the Super Contorted 'Tubular' Polar Areas of Magnetic Fields". Adv Sci Eng Med. 2020; 12: 571-575.

371. Heidari A, Schmitt K, Henderson M, Besana E. "Specific and Selective Targeting Human Cancer Cells, Tissues and Tumors with Seaborgium Nanoparticles as Carriers and Nano-Enhanced Drug Delivery and Therapeutic in Cancer Treatment and Beyond under Synchrotron Radiation". Parana Journal of Science and Education. 2020; 6: 8-50.

372. Heidari A. "Enhancement of Visible Synchrotron Absorption in Cadmium Oxide (CdO) Nanoparticles Thin Layer Using Plasmonic Nanostructures: A Two-Dimensional (2D) Simulation". Sci Int. (Lahore). 2020; 32: 329-354.

373. Heidari A, Schmitt K, Henderson M, Besana E. "Nanomedicines Based Americium Nanoparticles Drug Delivery Systems for Anti-Cancer Targeting and Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-18.

374. Heidari A, Schmitt K, Henderson M, Besana E. "Study of Exclusively Focused on Translational Aspects of Praseodymium Nanoparticles Drug Delivery under Super Contorted Tubular Polar Areas of Magnetic Fields as Optothermal Human Gum Cancer Cells, Tissues and Tumors Treatment Technique under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-17.

375. Heidari A, Schmitt K, Henderson M, Besana E. "Research Activities on Novel Drug Delivery Systems of Astatine Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-17.

376. Heidari A, Schmitt K, Henderson M, Besana E. "Unprecedented Progresses of Biomedical Nanotechnology during Conventional Smart Drug Delivery Systems (SDDSs) of Francium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-20.

377. Heidari A, Schmitt K, Henderson M, Besana E. "Non-Invasive Image-Guided Targeted Drug Delivery of Radium Nanoparticles in Human Gum Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation". Dent Oral Maxillofac Res. 2020; 6: 1-20.

378. Heidari A. "A Novel Approach to Reduce Toxicities and to Improve Bioavailabilities of DNA/RNA of Human Cancer Cells-Containing Cocaine (Coke), Lysergide (Lysergic Acid Diethyl Amide or LSD), Δ9-Tetrahydrocannabinol (THC) [(-)-trans-Δ^9-Tetrahydrocannabinol. 2020.

379. Heidari A. "Investigation of Prevention, Protection and Treatment of Lopinavir Effectiveness on Coronavirus Disease-2019 (COVID-19) Infection Using Fourier Transform Raman (FT-Raman) Biospectroscopy". AJAN. 2020; 1: 36-60.

380. Heidari A. "Stimulated FT-IR Biospectroscopic Study of Lopinavir Protective and Therapeutic Effect as a Potent Drug on Coronavirus Disease-2019 (COVID-19) Infection". AJAN. 2020; 1: 61-85.

381. Heidari A, Gobato R. "The Comparison of Active Cooperative and Traditional Teaching Methods in Nanochemistry Students' Satisfaction and Learning of Clinical Nanochemistry". AJAN. 2020; 1: 86-112.

382. Heidari A, Gobato R. "Study of Nanochemistry Students' Satisfaction and Learning with Blended Education: An Action Research Study". AJAN. 2020; 1: 113-138.

383. Heidari A. "Study of Stimulated Raman Biospectroscopy in Lopinavir as a Potent Drug against Coronavirus Disease-2019 (COVID-19) Infection". AJAN. 2020; 1: 139-163.

384. Heidari A. "In Situ Monitoring of Ritonavir Protective and Therapeutic Influence as a Potent Drug on Coronavirus Disease-2019 (COVID-19) Infection by Attenuated Total Reflectance-Fourier Transform Infrared (ATR-FTIR Fingerprint) Biospectroscopy". Saudi J Biomed Res. 2020; 5: 128-151.

385. Heidari A. "A Stimulated FT-IR Biospectroscopic Study of Ritonavir Protective and Therapeutic Effect as a Potent Drug on Coronavirus Disease-2019 (COVID-19) Infection". Saudi J Biomed Res. 2020; 5: 152-174.

386. Heidari A. "Application of Single-Walled Carbon Nanotubes (SWCNT) in the Production of Glucose Biosensors and Improving Their Performance Using Gold Colloidal Nanoparticles and Usage of Polyaniline Nanostructure-Based Biosensors for Detecting Glucose and Cholesterol". Malaysian Journal of Chemistry. 2020; 22: 121-162.

387. Heidari A. "In Situ Monitoring of Lopinavir Protective and Therapeutic Influence as a Potent Drug on Coronavirus Disease-2019 (COVID-19) Infection by Attenuated Total Reflectance-Fourier Transform Infrared (ATR-FTIR Fingerprint) Biospectroscopy". Parana Journal of Science and Education (PJSE). 2020; 6: 29-60.

388. Heidari A, Schmitt K, Henderson M, Besana E. "Modelling and Simulation of Interaction of Magnetobremsstrahlung Radiation and Nihonium Nanoparticles Using Bending Magnets, Undulators and/or Wigglers in Storage Rings for Human Cancer Cells, Tissues and Tumors Treatment". Sci Int (Lahore). 2020; 32: 361-385.

389. Heidari A. "Oncological Study of Thin Layers of Imatinib Molecule Nanostructure for Chronic Myelogenous Leukemia (CML), Acute Lymphocytic Leukemia (ALL), Philadelphia Chromosome-Positive (Ph+), Gastrointestinal Stromal Tumors (GIST), Hypereosinophilic Syndrome (HES), Chronic Eosinophilic Leukemia (CEL), Systemic Mastocytosis and Myelodysplastic Syndrome Treatment". Adv. Sci Eng Med. 2020; 12: 753-760.

390. Heidari A. "Infrastructure of Synchrotronic Biosensor Based on Semiconductor Device Fabrication for Tracking, Monitoring, Imaging, Measuring, Diagnosing and Detecting Cancer Cells". Semiconductor Science and Information Devices. 2019; 1: 29-57.

391. Heidari A. "In Situ Characterization of Lopinavir by ATR-FTIR Biospectroscopy". Computational Chemistry. 2020; 8: 27-42.

392. Heidari A. "Study of Stimulated Raman Biospectroscopy in Ritonavir as a Potent Drug against Coronavirus Disease-2019 (COVID-19) Infection". Saudi J Biomed Res. 2020; 5: 188-211.

393. Heidari A. "Investigation of Prevention, Protection and Treatment of Ritonavir Effectiveness on Coronavirus Disease-2019 (COVID-19) Infection Using Fourier Transform Raman (FT-Raman) Biospectroscopy". Saudi J Biomed Res. 2020; 5: 212-235.

394. Gobato R, Heidari A. "Cyclone Bomb Hits Southern Brazil in Mid-Winter 2020". Journal of Atmospheric Science Research. 2020; 3: 8-12.

395. Heidari A. "A Biospectroscopic and Bioimaging Analysis of Imatinib Nanoparticles Aggregation Linked to DNA/RNA by Bcr-Abl Tyrosine-Kinase Inhibitors (TKI) with Various Chain Length". Sci. Int. (Lahore). 2020; 32: 459-482.

396. Heidari A. "Future Perspectives and Shaping Trends in Gastroenterology and Digestive Disorders". J Health Med Res. 2019; 1: 47-48.

397. Heidari A. "Latest Research Works and Innovations in the Field of Oncology". J Carcinog Mutagen. 2020; 11: e126.

398. Heidari A. "Investigating the Effect of Synchrotron Removal from Raman Spectra for Quantitative Analysis of Cancer Tissues". Current Research in Cytology and Histology. 2020; 1: 29-35.

399. Gobato R, Gobato MR, Heidari A, Mitra A. "Potential in the Elimination of Cancer Cells through Synchrotron Radiation: A Hartree-Fock Methods Analysis Protonated Rhodochrosite Crystal". Dent Oral Maxillofac Res. 2020; 6: 1-8.

400. Gobato R, Gobato MR, Heidari A, Mitra A, "Infrared Spectrum, Apt Charges and Mulliken of Hartreefock Methods Protonated Rhodochrosite Crystal". Dent Oral Maxillofac Res. 2020; 6: 1-8.

401. Gobato R, Dosh IKK, Heidari A, Mitra A, Gobato MR. "A Novel and Exquisite Approach to Single Layer Bioinorganic Membranes", Dent Oral Maxillofac Res. 2020; 6: 1-4.

402. Heidari A. "Manufacture of Synchrotronic Biosensor Using Os-Pd/HfC Nanocomposite for Tracking, Monitoring, Imaging, Measuring, Diagnosing and Detecting Cancer Cells". Journal of Clinical and Translational Oncology. 2020; 1: 20-26.

403. Heidari A. "Role and Applications of Synchrotron Removal from Raman Spectra for Quantitative Analysis of Cancer Tissues". Aswan University Journal of Environmental Studies (AUJES). 2020; 1: 57-96.

404. Gobato R, Heidari A, Mitra A, Gobato MR. "Vortex Cotes's Spiral in an Extratropical Cyclone in the Southern Coast of Brazil". ResearchGate. 2021..

405. Heidari A. "Investigation of Role and Applications of Polymeric Stimuli-Responsive Nanocomposite Materials as Biomolecules for Cancer Targeted in Anti-Cancer Nano Drugs Delivery Agents and Systems". Parana Journal of Science and Education (PJSE). 2020; 6: 39-74.

406. Gobato R, Heidari A, Mitra A, Gobato MR. "Vortex Cotes's Spiral in an Extratropical Cyclone in the Southern Coast of Brazil". Archives in Biomedical Engineering & Biotechnology. 2020; 4: 1-4.

407. Gobato R, Heidari A. "Vortex Hits Southern Brazil in 2020". J Cur Tre Phy Res App. 2020; 1: 109-112.

408. Heidari A. Synthesis of Fructose Biosensors and Progressing Their Efficiency Using Californium Colloidal Nanoparticles for Detecting Fructose and Triglycerides. Advanced Science. Engineering and Medicine. 2020; 12: 1002-1017.

409. Heidari A, Gobato R, Mitra A, Gobato MR. Cotes's Spiral Vortex in Extratropical Cyclone Bomb South Atlantic Oceans. Aswan University Journal of Environmental Studies. 2020; 1: 147-156.

410. Heidari A. "Young Researcher Forum for 2nd World Congress on Neurology". J Neurol Neurophysiol. 2019; 10: 4.

411. Heidari A. "World Congress on Health and Medical Science", Journal of Emerging Diseases and Preventive Medicine. 2020; 3: 1.

412. Heidari A. "Scientific Challenges and Recent Advancements of Dermatology and Cosmetology". J Clin Exp Pathol. 2019; 3.

413. Gobato R, Heidari A, Mitra A. "Bioinorganic Membrane Using Kurumi, A New Liquid Crystal". Sumerianz Journal of Biotechnology. 2021; 4: 4-7.

414. Heidari A. "A Stimulated FT-IR Biospectroscopic Study of Lopinavir Protective and Therapeutic Effect as a Potent Drug on Coronavirus Disease-2019 (COVID-19) Infection". Parana Journal of Science and Education (PJSE). 2021; 7: 1-33.

415. Heidari A. "Simulation of the Variations of Surface Synchrotron Resonance Spectrum of Arranged Cadmium Oxide (CdO) Nanoparticles over Cancer Tissues Matrix with Size and Distance", Parana Journal of Science and Education (PJSE). 2021; 7: 34-67.

416. Heidari A, Gobato R. "Spherical Paramagnetic Contribution to Shielding Tensor Analysis of Nuclear Magnetic Resonance Signals in Gum Cancer Cells, Tissues and Tumors". Dent Oral Maxillofac Res. 2020; 6: 1-2.

417. Heidari A, Gobato R. "Exact NMR Simulation of Anti-Cancer Nano Drug-DNA/RNA Complexes in Gum Cancer Cells Spin Systems Using Tensor Train Formalism". Dent Oral Maxillofac Res. 2020; 6: 1-2.

418. Heidari A, Gobato R. "The Anti-Cancer Nano Drug Delivery 13C-Edited/13C-Filtered Transferred Dynamic 15N{1H} NOE Measurements for Studying DNA/RNA Interactions with Short Non-Linear Motifs: A Modern Tool for Studying DNA/RNA Dynamics in Gum Cancer Cells". Dent Oral Maxillofac Res. 2020; 6: 1-2.

419. Heidari A, Gobato R. "DNA/RNA of Gum Cancer Cells-Anti-Cancer Nano Drugs Ligands Structure Determination with the Two-Dimensional NMR Molecular Line Shape Analysis of Single, Multiple, Zero and Double Quantum Correlation Experiments". Dent Oral Maxillofac Res. 2020; 6: 1-3.

420. Heidari A, Gobato R. "Investigation of the Internal Structure and Dynamics of Gum Cancer Cells, Tissues and Tumors by 13C-NMR Spectra of DNA/RNA of Gum Cancer Cells as an Essential Structural Tool for Integrative Studies of Gum Cancer Cells Development". Dent Oral Maxillofac Res. 2020; 6: 1-3.

421. Heidari A, Gobato R. "NMR and Molecular Dynamics Studies Combined to Anti-Cancer Nano Drugs and DNA/RNA Interactions in Gum Cancer Cells and Their Modulations with Resistance Mutations". Dent Oral Maxillofac Res. 2020; 6: 1-2.

422. Heidari A, Gobato R. "Advanced Isotopic Labeling for the NMR Investigation of Challenging DNA/RNA of Gum Cancer Cells and Anti-Cancer Nano Drugs for Production of Isotope-Labeled DNA/RNA in Gum Cancer Cells for NMR Spectroscopy". Dent Oral Maxillofac Res. 2020; 6: 1-3.

423. Heidari A, Gobato R. "Simultaneous Detection of Intra- and Inter-Molecular Paramagnetic Relaxation Enhancements in DNA/RNA of Gum Cancer Cells-Anti-Cancer Nano Drugs Complexes". Dent Oral Maxillofac Res. 2020; 6: 1-2.

424. Heidari A, Gobato R. "Impact of DNA/RNA Self-Alignment in a Strong Magnetic Field on the Interpretation of Indirect Spin-Spin Interactions Using NMR Line Shape Analysis of a Multi-State DNA/RNA Ligand Binding Mechanism in Gum Cancer Cells". Dent Oral Maxillofac Res. 2020; 6: 1-2.

425. Heidari A, Gobato R. "Application of Anti-Cancer Nano Drugs Particles (ACNDP) to NMR Characterization of Viral Gum Cancer Cell Membrane DNA/RNA Interactions for Extracting DNA/RNA Dynamics Information from Overlapped NMR Signals Using Relaxation Dispersion Difference NMR Spectroscopy". Dent Oral Maxillofac Res. 2020; 6: 1-2.

426. Heidari A, Gobato R. "Diagnosis of Gum Cancer Cells from DNA/RNA Using Database Mining and Support Vector Regression through High Resolution 4D HPCH Experiment for Sequential Assignment of 13C-Labeled DNAs/RNAs in Gum Cancer Cells". Dent Oral Maxillofac Res. 2020; 6: 1-2.

427. Heidari A. Gobato R. "New Opportunities for Tensor-Free Calculations of Residual Dipolar Couplings for the Study of Dynamic Nuclear Polarization of Nucleic Acids with Endogenously Bound Manganese in Gum Cancer Cells". Dent Oral Maxillofac Res. 2020; 6: 1-2.

428. Heidari A. "Pros and Cons Controversy on Synchrotronic Biosensor Using Os-Pd/HfC Nanocomposite for Tracking, Monitoring, Imaging, Measuring, Diagnosing and Detecting Cancer Cells, Tissues and Tumors". Indones J Cancer Chemoprevent. 2021; 12: 1-10.