

# 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

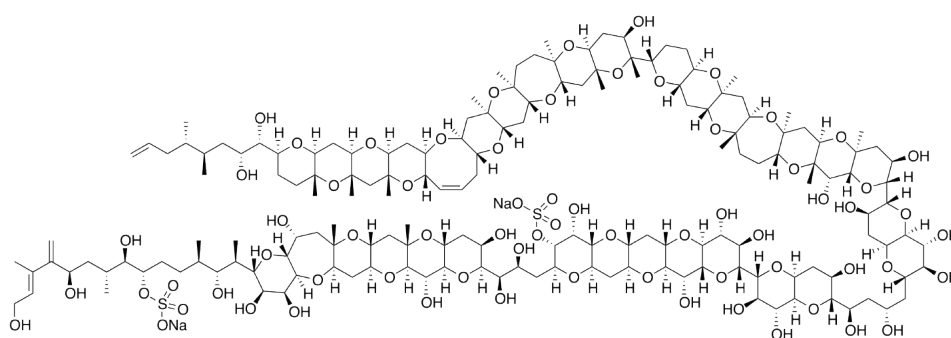
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## Abstract

Maitotoxin (or MTX) is an extremely potent toxin produced by *Gambierdiscus toxicus*, a dinoflagellate species. Maitotoxin is so potent that it has been demonstrated that an intraperitoneal injection of 130 ng/kg was lethal in mice. Maitotoxin was named from the ciguateric fish *Ctenochaetus striatus*—called "maito" in Tahiti—from which maitotoxin was isolated for the first time. It was later shown that maitotoxin is actually produced by the dinoflagellate *Gambierdiscus toxicus*. Parameters such as FT-IR and Raman vibrational wavelengths and intensities for single crystal Maitotoxin are calculated using density functional theory and were compared with empirical results. The investigation about vibrational spectrum of cycle dimers in crystal with carboxyl groups from each molecule of acid was shown that it leads to create Hydrogen bonds for adjacent molecules. The current study aimed to investigate the possibility of simulating the empirical values. Analysis of vibrational spectrum of Maitotoxin is performed based on theoretical simulation and FT-IR empirical spectrum and Raman empirical spectrum using density functional theory in levels of HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\*. Vibration modes of methylene, carboxyl acid and phenyl cycle are separately investigated. The obtained values confirm high accuracy and validity of results obtained from calculations.



Molecular structure of Maitotoxin [1-42].

## Introduction

Maitotoxin (or MTX) is an extremely potent toxin produced by *Gambierdiscus toxicus*, a dinoflagellate species. Maitotoxin is so potent that it has been demonstrated that an intraperitoneal injection of 130 ng/kg was lethal in mice. Maitotoxin was named from the ciguateric fish *Ctenochaetus striatus*—called "maito" in Tahiti—from which maitotoxin was isolated for the first time. It was later shown that maitotoxin is actually produced by the dinoflagellate *Gambierdiscus toxicus*. Density Functional Theory (DFT) is one of the most powerful

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**Key words:** vibronic structure, vibrational spectra analysis, density functional theory (DFT), maitotoxin, non-focal functions of becke, correlation functions of lee-yang-parr, time-resolved absorption and resonance, FT-IR, raman biospectroscopy, anti-gum cancer drug

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calculation methods for electronic structures [5-7]. Numerous results have been previously studied and indicate successful use of these methods [8-10]. The theory is one of the most appropriate methods for simulating the vibrational wavenumbers, molecular structure as well as total energy. It may be useful to initially consider the calculated results by density functional theory using HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\* approach [11-16]. It should be noted that calculations are performed by considering one degree of quantum interference as well as polarization effects of 2d orbitals in interaction [17-442].

## Details of calculations

All calculations of molecular orbital in the base of ab are performed by Gaussian 09. In calculation process, the structure of Maitotoxin molecule (Figure 1) is optimized and FT-IR and Raman wavenumbers are calculated using HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\* base. All optimized structures are adjusted with minimum energy. Harmonic vibrational wavenumbers are calculated using second degree of derivation to adjust convergence on potential surface as good as possible and to evaluate vibrational energies at zero point. In optimized structures considered in the current study, virtual frequency modes are not observed which indicates that the minimum potential energy surface is correctly chosen. The optimized geometry is calculated by minimizing the energy relative to all geometrical quantities without forcing any constraint on molecular symmetry. Calculations were performed by Gaussian 09. The current calculation is aimed to maximize structural optimization using density functional theory. The calculations of density functional theory are performed by HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\* function in which non-focal functions of Becke and correlation functions of Lee-Yang-Parr beyond the Franck-Condon approximation are used. After completion of optimization process, the second order derivation of energy is calculated as a function of core coordination and is investigated to evaluate whether the structure is accurately minimized. Vibrational frequencies used to simulate spectrums presented in the current study are derived from these second order derivatives. All calculations are performed for room temperature of 525 (K).

## Vibration analysis

Analysis of vibrational spectrum of Maitotoxin is performed based on theoretical simulation and FT-IR empirical spectrum and Raman empirical spectrum using density functional theory in levels

of HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\*. Vibration modes of methylene, carboxyl acid and phenyl cycle are separately investigated.

C-H stretching vibrations in single replacement of benzene cycles are usually seen in band range of 3220-3470  $\text{cm}^{-1}$ . Weak Raman bands are at 3209  $\text{cm}^{-1}$  and 3222  $\text{cm}^{-1}$ . C-C stretching mode is a strong Raman mode at 1219  $\text{cm}^{-1}$ . Raman weak band is seen at 1693  $\text{cm}^{-1}$ , too. Bending mode of C-H is emerged as a weak mode at 1418  $\text{cm}^{-1}$  and 1217  $\text{cm}^{-1}$  and a strong band at 1301  $\text{cm}^{-1}$  in Raman spectrum. Raman is considerably active in the range of 1220-1470  $\text{cm}^{-1}$  which 1213  $\text{cm}^{-1}$  indicates this issue.

C-H skew-symmetric stretching mode of methylene group is expected at 3205  $\text{cm}^{-1}$  and its symmetric mode is expected at 3019  $\text{cm}^{-1}$ . Skew-symmetric stretching mode of  $\text{CH}_2$  in Maitotoxin has a mode in mid-range of Raman spectrum at 3120-3240  $\text{cm}^{-1}$ . When this mode is symmetric, it is at 3115  $\text{cm}^{-1}$  and is sharp. The calculated wavenumbers of higher modes are at 3083  $\text{cm}^{-1}$  and 3113  $\text{cm}^{-1}$  for symmetric and skew-symmetric stretching mode of methylene, respectively.

Scissoring vibrations of  $\text{CH}_2$  are usually seen at the range of 1547-1601  $\text{cm}^{-1}$  which often includes mid-range bands. Weak bands at 1560  $\text{cm}^{-1}$  are scissoring modes of  $\text{CH}_2$  in Raman spectrum. Moving vibrations of methylene are usually seen at 1489  $\text{cm}^{-1}$ . For the investigated chemical in the current study, these vibrations are at 1359  $\text{cm}^{-1}$  were calculated using density functional theory. Twisting and rocking vibrations of  $\text{CH}_2$  are seen in Raman spectrum at 935  $\text{cm}^{-1}$  and 1209  $\text{cm}^{-1}$ , respectively, which are in good accordance with the results at 919  $\text{cm}^{-1}$  and 1184  $\text{cm}^{-1}$ , respectively.

In a non-ionized carboxyl group ( $\text{COOH}$ ), stretching vibrations of carbonyl [ $\text{C=O}$ ] are mainly observed at the range of 1860-1918  $\text{cm}^{-1}$ . If dimer is considered as an intact constituent, two stretching vibrations of carbonyl for symmetric stretching are at 1760-1805  $\text{cm}^{-1}$  in Raman spectrum. In the current paper, stretching vibration of carbonyl mode is at 1817  $\text{cm}^{-1}$  which is a mid-range value.

Stretching and bending bands of hydroxyl can be identified by width and band intensity which in turn is dependent on bond length of Hydrogen. In dimer form of Hydrogen bond, stretching band of O-H is of a strong Raman peak at 1387  $\text{cm}^{-1}$  which is due to in-plane metamorphosis mode. Out-of-plane mode of O-H group is a very strong mode of peak at 1069  $\text{cm}^{-1}$  of Raman spectrum. The stretching mode of C-O (H) emerges as a mid-band of Raman spectrum at 1267  $\text{cm}^{-1}$ .

Lattice vibrations are usually seen at the range of 0-570  $\text{cm}^{-1}$ . These modes are induced by rotary and transferring vibrations of molecules and vibrations and are including Hydrogen bond. Bands with low wavenumbers of Hydrogen bond vibrations in FT-IR and Raman spectrum (Figure 2) are frequently weak, width and unsymmetrical. Rotary lattice vibrations are frequently stronger than transferring ones. Intra-molecular vibrations with low wavenumbers involving two-bands O-H ...O dimer at 108  $\text{cm}^{-1}$ , 213  $\text{cm}^{-1}$  and 269  $\text{cm}^{-1}$  are attributed to a rotary moving of two molecules involving in-plane rotation of molecules against each other.

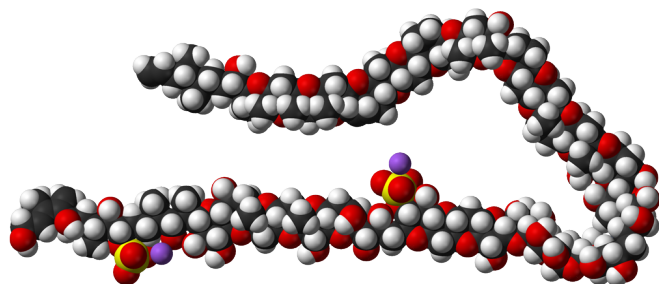


Figure 1. Section of the Maitotoxin [43-93]

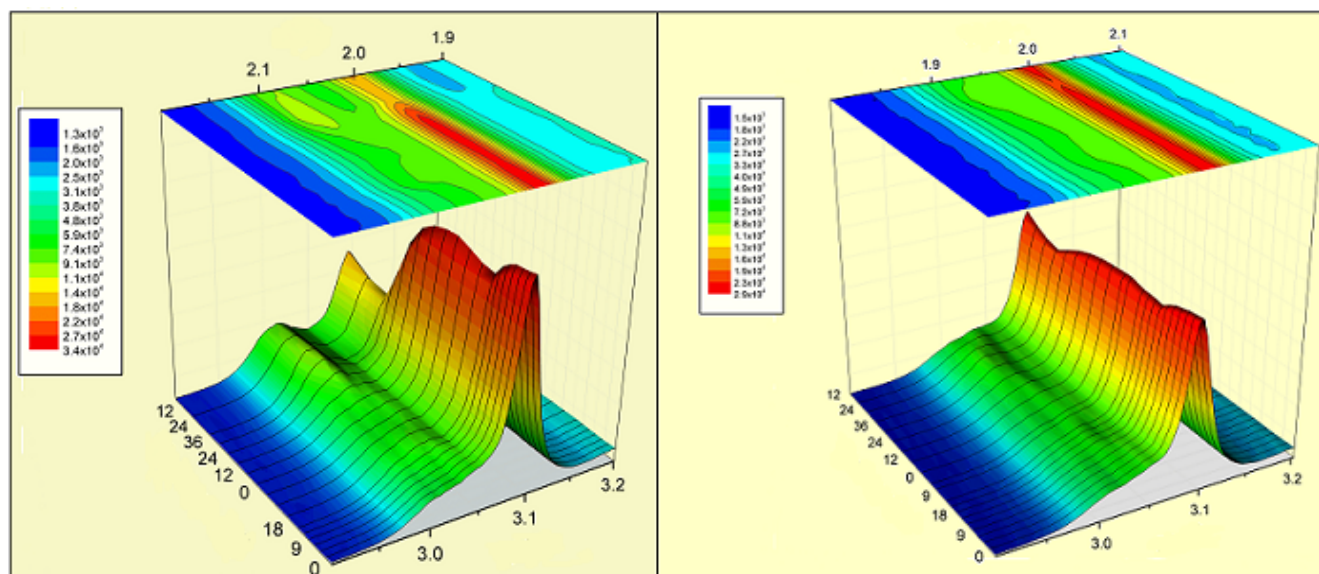


Figure 2. 3D Simulation of (a) FT-IR spectrum (right) and (b) Raman (left) spectrum of Maitotoxin

## Conclusion and summary

Calculations of density functional theory using HF/6-31G\*, HF/6-31++G\*\*, MP2/6-31G, MP2/6-31++G\*\*, BLYP/6-31G, BLYP/6-31++G\*\*, B3LYP/6-31G and B3LYP6-31-HEG\*\* levels were used to obtain vibrational wavenumbers and intensities in single crystal of Maitotoxin. Investigation and consideration of vibrational spectrum confirm the formation of dimer cycles in the investigated crystal with carboxyl groups from each Hydrogen molecule of acid protected from adjacent molecules. The calculated vibrational spectrum which obtains from calculations of density functional theory is in good accordance with recorded empirical values which indicates successful simulation of the problem. The obtained results indicate that the results obtained from theoretical calculations are valid through comparing with empirical recorded results.

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## References

- Yu, P; Wu, J; Liu, S; Xiong, J; Jagadish, C; Wang, Z M Design and Fabrication of Silicon Nanowires towards Efficient Solar Cells Nano Today2016, 11, 704–737, 101016/jnantod201610001
- Sandhu, S; Fan, S Current-Voltage Enhancement of a Single Coaxial Nanowire Solar Cell ACS Photonics2015, 2, 1698–1704, 101021/acsp Photonics5b00236
- van Dam, D; Van Hoof, N J J; Cui, Y; van Veldhoven, P J; Bakkers, E P M; Gómez Rivas, J; Haverkort, J E M High-Efficiency Nanowire Solar Cells with Omnidirectionally Enhanced Absorption Due to Self-Aligned Indium-Tin-Oxide Mie Scatterers ACS Nano2016, 10, 11414–11419, 101021/acsnano6b06874
- Luo, S; Yu, W B; He, Y; Ouyang, G Size-Dependent Optical Absorption Modulation of Si/Ge and Ge/Si Core/shell Nanowires with Different Cross-Sectional Geometries Nanotechnology2015, 26, 085702, 101088/0957-4484/26/8/085702
- Yu, P; Yao, Y; Wu, J; Niu, X; Rogach, L; Wang, Z Effects of Plasmonic Metal Core-Dielectric Shell Nanoparticles on the Broadband Light Absorption Enhancement in Thin Film Solar Cells Sci Rep2017, 7, 7696, 101038/s41598-017-08077-9
- Gouda, M; Allam, N K; Swillam, M Efficient Fabrication Methodology of Wide Angle Black Silicon for Energy Harvesting Applications RSC Adv2017, 7, 26974–26982, 101039/C7RA03568C
- Branz, H M; Yost, V E; Ward, S; Jones, K M; To, B; Stradins, P Nanostructured Black Silicon and the Optical Reflectance of Graded-Density Surfaces Appl Phys Lett2009, 94, 231121, 101063/13152244
- Fazio, B; Artoni, P; Antonia Iatí, M; D'Andrea, C; Lo Faro, M J; Del Sorbo, S; Pirotta, S; Giuseppe Gucciardi, P; Musumeci, P; Salvatore Vasi, C; Saija, R; Galli, M; Priolo, F; Irrera, S Strongly Enhanced Light Trapping in a Two-Dimensional Silicon Nanowire Random Fractal Array Light: Sci Appl2016, 5, e16062, 101038/ls201662
- Ko, M-D; Rim, T; Kim, K; Meyyappan, M; Baek, C-K High Efficiency Silicon Solar Cell Based on Asymmetric Nanowire Sci Rep2015, 5, 11646, 101038/srep11646
- Oh, J; Yuan, H C; Branz, H M AN 182%-Efficient Black-Silicon Solar Cell Achieved through Control of Carrier Recombination in Nanostructures Nat Nanotechnol2012, 7, 743–748, 101038/nnano2012166
- Lin, H; Xiu, F; Fang, M; Yip, S; Cheung, H Y; Wang, F; Han, N; Chan, K S; Wong, C Y; Ho, J C Rational Design of Inverted Nanopencil Arrays for Cost-Effective, Broadband, and Omnidirectional Light Harvesting ACS Nano2014, 8, 3752–3760, 101021/nn500418x
- Garnett, E; Yang, P Light Trapping in Silicon Nanowire Solar Cells Nano Lett2010, 10, 1082–1087, 101021/nl100161z
- Misra, S; Yu, L; Foldyna, M; Roca I Cabarrocas, P High Efficiency and Stable Hydrogenated Amorphous Silicon Radial Junction Solar Cells Built on VLS-Grown Silicon Nanowires Sol Energy Mater Sol Cells2013, 118, 90–95, 101016/jsolmat201307036
- Kelzenberg, M D; Boettcher, S W; Petykiewicz, J; Turner-Evans, D B; Putnam, M C; Warren, E L; Spurgeon, J M; Briggs, R M; Lewis, N S; Atwater, H Enhanced Absorption and Carrier Collection in Si Wire Arrays for Photovoltaic Applications Nat Mater2010, 9, 239–244, 101038/nmat2635
- Tian, B; Zheng, X; Kempa, T J; Fang, Y; Yu, N; Yu, G; Huang, J; Lieber, C M Coaxial Silicon Nanowires as Solar Cells and Nanoelectronic Power Sources Nature2007, 449, 885–889, 101038/nature06181
- Razek, S; Swillam, M; Allam, N K Vertically Aligned Crystalline Silicon Nanowires with Controlled Diameters for Energy Conversion Applications: Experimental and Theoretical Insights J Appl Phys2014, 115, 194305, 101063/14876477
- Dhindsa, N; Walia, J; Saini, S SA Platform for Colorful Solar Cells with Enhanced Absorption Nanotechnology2016, 27, 495203, 101088/0957-4484/27/49/495203
- Dhindsa, N; Walia, J; Pathirane, M; Khodadad, I; Wong, W S; Saini, S S Adjustable Optical Response of Amorphous Silicon Nanowires Integrated with Thin Films Nanotechnology2016, 27, 145703, 101088/0957-4484/27/14/145703



19. Zhu, J; Yu, Z; Burkhard, G F; Hsu, C-M; Connor, S T; Xu, Y; Wang, Q; McGehee, M; Fan, S; Cui, Y Optical Absorption Enhancement in Amorphous Silicon Nanowire and Nanocone Arrays Nano Lett2009, 9, 279–282, 101021/nl802886y
20. Klinger, D; Łusakowska, E; Zymierska, D Nano-Structure Formed by Nanosecond Laser Annealing on Amorphous Si Surface Mater Sci Semicond Process2006, 9, 323–326, 101016/jmssp200601027
21. Kumar, P; Krishna, M G; Bhattacharya, Excimer Laser Induced Nanostructuring of Silicon Surfaces J Nanosci Nanotechnol2009, 9, 3224–3232, 101166/jnn2009207
22. Kumar, P Surface Modulation of Silicon Surface by Excimer Laser at Laser Fluence below Ablation Threshold Appl Phys A: Mater Sci Process2010, 99, 245–250, 101007/s00339-009-5510-x
23. Adikaari, D T; Silva, S R P Thickness Dependence of Properties of Excimer Laser Crystallized Nano-Polycrystalline Silicon J Appl Phys2005, 97, 114305, 101063/11898444
24. Adikaari, D T; Dissanayake, D M N M; Hatton, R; Silva, S R P Efficient Laser Textured Nanocrystalline Silicon-Polymer Bilayer Solar Cells Appl Phys Lett2007, 90, 203514, 101063/12739365
25. Adikaari, D T; Silva, S R P Excimer Laser Crystallization and Nanostructuring of Amorphous Silicon for Photovoltaic Applications Nano2008, 3, 117–126, 101142/S1793292008000915
26. Tang, Y F; Silva, S R P; Boskovic, B O; Shannon, J M; Rose, M J Electron Field Emission from Excimer Laser Crystallized Amorphous Silicon Appl Phys Lett2002, 80, 4154–4156, 101063/11482141
27. Jin, S; Hong, S; Mativenga, M; Kim, B; Shin, H H; Park, J K; Kim, T W; Jang, J Low Temperature Polycrystalline Silicon with Single Orientation on Glass by Blue Laser Annealing Thin Solid Films2016, 616, 838–841, 101016/jtsf201610026
28. Crouch, C H; Carey, J E; Warrender, J M; Aziz, M J; Mazur, E; Génin, F Y Comparison of Structure and Properties of Femtosecond and Nanosecond Laser-Structured Silicon Appl Phys Lett2004, 84, 1850–1852, 101063/11667004
29. Wu, C; Crouch, C H; Zhao, L; Carey, J E; Younkin, R; Levinson, J; Mazur, E; Farrell, R M; Gothoskar, P; Karger, Near-Unity below-Band-Gap Absorption by Microstructured Silicon Appl Phys Lett2001, 78, 1850–1852, 101063/11358846
30. Pedraza, J; Fowlkes, J D; Lowndes, D H Silicon Microcolumn Arrays Grown by Nanosecond Pulsed-Excimer Laser Irradiation Appl Phys Lett1999, 74, 2322, 101063/1123838
31. Pedraza, J; Fowlkes, J D; Jesse, S; Mao, C; Lowndes, D H Surface Micro-Structuring of Silicon by Excimer-Laser Irradiation in Reactive Atmospheres Appl Surf Sci2000, 168, 251–257, 101016/S0169-4332(00)00611-5
32. Porte, H P; Turchinovich, D; Persheyev, S; Fan, Y; Rose, M J; Jepsen, P U On Ultrafast Photoconductivity Dynamics and Crystallinity of Black Silicon IEEE Trans Terahertz Sci Technol2013, 3, 331–341, 101109/TTHZ20132255917
33. Georgiev, D G; Baird, R J; Avrutsky, I; Auner, G; Newaz, G Controllable Excimer-Laser Fabrication of Conical Nano-Tips on Silicon Thin Films Appl Phys Lett2004, 84, 4881–4883, 101063/11762978
34. Eizenkop, J; Avrutsky, I; Georgiev, D G; Chaudhary, V Single-Pulse Excimer Laser Nanostructuring of Silicon: A Heat Transfer Problem and Surface Morphology J Appl Phys2008, 103, 094311, 101063/12910196
35. Eizenkop, J; Avrutsky, I; Auner, G; Georgiev, D G; Chaudhary, V Single Pulse Excimer Laser Nanostructuring of Thin Silicon Films: Nanosharp Cones Formation and a Heat Transfer Problem J Appl Phys2007, 101, 094301, 101063/12720185
36. Hong, L; Wang, X C; Zheng, H Y; He, L; Wang, H; Yu, H Y; Rusli Femtosecond Laser Induced Nanocone Structure and Simultaneous Crystallization of 16  $\mu\text{M}$  Amorphous Silicon Thin Film for Photovoltaic Application J Phys D: Appl Phys2013, 46, 195109, 101088/0022-3727/46/19/195109
37. Hong, L; Wang, X; Rusli; Wang, H; Zheng, H; Yu, H Crystallization and Surface Texturing of Amorphous-Si Induced by UV Laser for Photovoltaic Application J Appl Phys2012, 111, 043106, 101063/13686612
38. Magdi, S; Swillam, M Broadband Absorption Enhancement in Amorphous Si Solar Cells Using Metal Gratings and Surface Texturing Proc SPIE2017, 10099, 1009912, 101117/122253326
39. Diedenhofen, S L; Janssen, O T; Grzela, G; Bakkers, E P M; Gómez Rivas, J Strong Geometrical Dependence of the Absorption of Light in Arrays of Semiconductor Nanowires ACS Nano2011, 5, 2316–2323, 101021/nn103596n
40. Jäger, S T; Strehle, S Design Parameters for Enhanced Photon Absorption in Vertically Aligned Silicon Nanowire Arrays Nanoscale Res Lett2014, 9, 511, 101186/1556-276X-9-511
41. Gouda, M; Elsayed, M Y; Khalifa, E; Ismail, Y; Swillam, M Lithography-Free Wide-Angle Antireflective Self-Cleaning Silicon Nanocones Opt Lett2016, 41, 3575, 101364/OL41003575
42. Magdi, S; Swillam, M Optical Analysis of Si-Tapered Nanowires/low Band Gap Polymer Hybrid Solar Cells Proc SPIE2017, 10099, 100991D, 101117/122253299
43. Jiang, Y; Gong, X; Qin, R; Liu, H; Xia, C; Ma, H Efficiency Enhancement Mechanism for Poly(3, 4-ethylenedioxythiophene):Poly(styrenesulfonate)/Silicon Nanowires Hybrid Solar Cells Using Alkali Treatment Nanoscale Res Lett2016, 11, 267, 101186/s11671-016-1450-5
44. Gong, X; Jiang, Y; Li, M; Liu, H; Ma, H Hybrid Tapered Silicon nanowire/PEDOT:PSS Solar Cells RSC Adv2015, 5 (14), 10310–10317, 101039/C4RA16603E
45. Mohammad, N S Understanding Quantum Confinement in Nanowires: Basics, Applications and Possible Laws J Phys: Condens Matter2014, 26, 423202, 101088/0953-8984/26/42/423202
46. Zhang, Y; Luo, S; Ouyang, G; Yang, G W Strain-Induced Optical Absorption Properties of Semiconductor Nanocrystals J Chem Phys2013, 138, 244702, 101063/14811222
47. He, Y; Yu, W; Ouyang, G Shape-Dependent Conversion Efficiency of Si Nanowire Solar Cells with Polygonal Cross-Sections J Appl Phys2016, 119, 225101, 101063/14953377
48. Tchakarov, S; Das, D; Saadane, O; Kharchenko, V; Suendo, V; Kail, F; Roca i Cabarrocas, P Helium versus Hydrogen Dilution in the Optimization of Polymorphous Silicon Solar Cells J Non-Cryst Solids2004, 338–340, 668–672, 101016/jnoncrysol200403068
49. Roszairi, H; Rahman, S High Deposition Rate Thin Film Hydrogenated Amorphous Silicon Prepared by Dc Plasma Enhanced Chemical Vapour Deposition of Helium Diluted Silane IEEE International Conference on Semiconductor Electronics, 2002 Proceedings ICSE 2002, Panang, Malaysia, Dec 19–21, 2002; IEEE: New York, NY, USA, 2002; pp 300–303, DOI: 101109/SMELEC20021217830
50. N'Guyen, T T T; Duong, H T T; Basuki, J; Montebault, V; Pascual, S; Guibert, C; Fresnais, J; Boyer, C; Whittaker, M R; Davis, T P; Fontaine, L Functional Iron Oxide Magnetic Nanoparticles with Hyperthermia-Induced Drug Release Ability by Using a Combination of Orthogonal Click Reactions Angew Chem, Int Ed2013, 52, 14152–14156, 101002/anie201306724
51. Xu, Z; Zhao, Y; Wang, X; Lin, T A Thermally Healable Polyhedral Oligomeric Silsesquioxane (POSS) Nanocomposite based on Diels-Alder chemistry Chem Commun2013, 49, 6755–6757, 101039/c3cc43432j
52. Engel, T; KICKELBICK, G Self-Healing Nanocomposites from Silica – Polymer Core – Shell Nanoparticles Polym Int2014, 63, 915–923, 101002/pi4642
53. Engel, T; KICKELBICK, G Furan-Modified Spherosilicates as Building Blocks for Self-Healing Materials Eur J Inorg Chem2015, 2015, 1226–1232, 101002/ejic201402551
54. Torres-Lugo, M; Rinaldi, C Thermal Potentiation of Chemotherapy by Magnetic Nanoparticles Nanomedicine2013, 8, 1689–1707, 102217/nnm13146
55. Hohlbein, N; Shaaban, ; Bras, R; Pyckhout-Hintzen, W; Schmidt, M Self-healing Dynamic Bond-based Rubbers: Understanding the Mechanisms in Ionomeric Elastomer Model Systems Phys Chem Chem Phys2015, 17, 21005–21017, 101039/C5CP00620A
56. Wu, C-S; Kao, T-H; Li, H-Y; Liu, Y-L Preparation of Polybenzoxazine-functionalized Fe<sub>3</sub>O<sub>4</sub> Nanoparticles through in situ Diels-Alder Polymerization for High Performance Magnetic Polybenzoxazine/Fe<sub>3</sub>O<sub>4</sub> Nanocomposites Compos Sci Technol2012, 72, 1562–1567, 101016/jcompscitech201206018
57. Menon, V; Madras, G; Bose, S Ultrafast Self-Healable Interfaces in Polyurethane Nanocomposites Designed Using Diels-Alder “Click” as an Efficient Microwave Absorber ACS Omega2018, 3, 1137–1146, 101021/acsomeg7b01845
58. Engel, T; KICKELBICK, G Thermoreversible Reactions on Inorganic Nanoparticle Surfaces: Diels-Alder Reactions on Sterically Crowded Surfaces Chem Mater2013, 25, 149–157, 101021/cm303049k
59. Schäfer, S; KICKELBICK, G Self-Healing Polymer Nanocomposites based on Diels-Alder reactions with Silica Nanoparticles: The Role of the Polymer Matrix Polymer2015, 69, 357–368, 101016/jpolymer201503017
60. Park, J S; Darlington, T; Starr, F; Takahashi, K; Riendeau, J; Thomas Hahn, H Multiple Healing Effect of Thermally Activated Self-Healing Composites based on Diels-Alder reaction Compos Sci Technol2010, 70, 2154–2159, 101016/jcompscitech201008017
61. Li, J; Liang, J; Li, L; Ren, F; Hu, W; Li, J; Qi, S; Pei, Q Healable Capacitive Touch Screen Sensors Based on Transparent Composite Electrodes Comprising Silver Nanowires and a Furan/Maleimide Diels-Alder Cycloaddition Polymer ACS Nano2014, 8, 12874–12882, 101021/nn506610p
62. Sun, S; Zeng, H; Robinson, D B; Raoux, S; Rice, P M; Wang, S X; Li, G Monodisperse MFe<sub>2</sub>O<sub>4</sub> (M = Fe, Co, Mn) Nanoparticles J Am Chem Soc2004, 126, 273–279, 101021/ja0380852

63. Frison, R; Cernuto, G; Cervellino, ; Zaharko, O; Colonna, G M; Guagliardi, ; Masciocchi, N Magnetite-Maghemite Nanoparticles in the 5–15 nm Range: Correlating the Core-Shell Composition and the Surface Structure to the Magnetic Properties A Total Scattering Study Chem Mater 2013, 25, 4820–4827, 101021/cm403360f
64. Santoyo Salazar, J; Perez, L; de Abril, O; Truong Phuoc, L; Ihiwakrim, D; Vazquez, M; Grenèche, J-M; Begin-Colin, S; Pourroy, G Magnetic Iron Oxide Nanoparticles in 10–40 nm Range: Composition in Terms of Magnetite/Maghemite Ratio and Effect on the Magnetic Properties Chem Mater 2011, 23, 1379–1386, 101021/cm103188a
65. Guerrero, G; Mutin, P H; Vioux, Anchoring of Phosphonate and Phosphinate Coupling Molecules on Titania Particles Chem Mater 2001, 13, 4367–4373, 101021/cm001253u
66. Babu, K; Dhamodharan, R Grafting of Poly(methyl methacrylate) Brushes from Magnetite Nanoparticles Using a Phosphonic Acid Based Initiator by Ambient Temperature Atom Transfer Radical Polymerization (ATATRP) Nanoscale Res Lett 2008, 3, 109–117, 101007/11671-008-9121-9
67. Mohapatra, S; Pramanik, P Synthesis and Stability of Functionalized Iron Oxide Nanoparticles using Organophosphorus Coupling Agents Colloids Surf, A 2009, 339, 35–42, 101016/jcolsurf200901009
68. Larsen, B ; Hurst, K M; Ashurst, W R; Serkova, N J; Stoldt, C R Mono- and Dialkoxysilane Surface Modification of Superparamagnetic Iron Oxide Nanoparticles for Application as Magnetic Resonance Imaging Contrast Agents J Mater Res 2012, 27, 1846–1852, 101557/jmr2012160
69. Davis, K; Qi, B; Witmer, M; Kitchens, C L; Powell, B ; Mefford, O T Quantitative Measurement of Ligand Exchange on Iron Oxides via Radiolabeled Oleic Acid Langmuir 2014, 30, 10918–10925, 101021/la502204g
70. Feichtenschlager, B; Pabisch, S; Peterlik, H; KICKELBICK, G Nanoparticle Assemblies as Probes for Self-Assembled Monolayer Characterization: Correlation between Surface Functionalization and Agglomeration Behavior Langmuir 2012, 28, 741–750, 101021/la2023067
71. Musa, O M Handbook of Maleic Anhydride Based Materials: Syntheses, Properties and Applications; Springer International Publishing: Switzerland, 2016; p 175ff
72. Sauer, R; Froimowicz, P; Scholler, K; Cramer, J M; Ritz, S; Mailander, V; Landfester, K Design, Synthesis, and Miniemulsion Polymerization of New Phosphonate Surfmers and Application Studies of the Resulting Nanoparticles as Model Systems for Biomimetic Mineralization and Cellular Uptake Chem - Eur J 2012, 18, 5201–5212, 101002/chem201103256
73. Lu, C; Bhatt, L R; Jun, H Y; Park, S H; Chai, K Y Carboxyl-Polyethylene Glycol-Phosphoric Acid: A Ligand for highly stabilized Iron Oxide Nanoparticles J Mater Chem 2012, 22, 19806–19811, 101039/c2jm34327d
74. Patsula, V; Kosinova, L; Lovric, M; Ferhatovic Hamzic, L; Rabyk, M; Konefal, R; Paruzel, ; Slouf, M; Herynek, V; Gajovic, S; Horak, D Superparamagnetic Fe<sub>3</sub>O<sub>4</sub> Nanoparticles: Synthesis by Thermal Decomposition of Iron(III) Glucuronate and Application in Magnetic Resonance Imaging ACS Appl Mater Interfaces 2016, 8, 7238–7247, 101021/acsami5b12720
75. Pothayee, N; Balasubramaniam, S; Davis, R M; Riffle, J S; Carroll, M R J; Woodward, R C; St Pierre, T G Synthesis of 'ready-to-adsorb' Polymeric Nanoshells for Magnetic Iron Oxide Nanoparticles via Atom Transfer Radical Polymerization Polymer 2011, 52, 1356–1366, 101016/jpolymer201101047
76. Daou, J; Begin-Colin, S; Grenèche, J M; Thomas, F; Derory, ; Bernhardt, P; Legaré, P; Pourroy, G Phosphate Adsorption Properties of Magnetite-Based Nanoparticles Chem Mater 2007, 19, 4494–4505, 101021/cm071046v
77. Breucker, L; Landfester, K; Taden, Phosphonic Acid-Functionalized Polyurethane Dispersions with Improved Adhesion Properties ACS Appl Mater Interfaces 2015, 7, 24641–24648, 101021/acsami5b06903
78. Sahoo, Y; Pizem, H; Fried, T; Golodnitsky, D; Burstein, L; Sukenik, C N; Markovich, I Alkyl Phosphonate/Phosphate Coating on Magnetite Nanoparticles: A Comparison with Fatty Acids Langmuir 2001, 17, 7907–7911, 101021/la010703+
79. Longo, R C; Cho, K; Schmidt, W G; Chabal, Y J; Thissen, P Monolayer Doping via Phosphonic Acid Grafting on Silicon: Microscopic Insight from Infrared Spectroscopy and Density Functional Theory Calculations Adv Funct Mater 2013, 23, 3471–3477, 101002/adfm201202808
80. Lushtinetz, R; Seifert, G; Jaehne, E; Adler, H-J Infrared Spectra of Alkylphosphonic Acid Bound to Aluminium Surfaces Macromol Symp 2007, 254, 248–253, 101002/masy200750837
81. Thomas, L C; Chittenden, R Characteristic Infrared Absorption Frequencies of Organophosphorus Compounds-II P-O(X) Bonds Spectrochim Acta 1964, 20, 489–502, 101016/0371-1951(64)80044-8
82. Quinones, R; Shoup, D; Behnke, G; Peck, C; Agarwal, S; Gupta, R K; Fagan, J W; Mueller, K T; Iulicci, R J; Wang, Q Study of Perfluorophosphonic Acid Surface Modifications on Zinc Oxide Nanoparticles Materials 2017, 10, 1–16, 103390/ma10121363
83. Lalatonne, Y; Paris, C; Serfaty, J M; Weinmann, P; Lecouvey, M; Motte, L Bis-Phosphonates-Ultra Small Superparamagnetic Iron Oxide Nanoparticles: A Platform towards Diagnosis and Therapy Chem Commun 2008, 2553–2555, 101039/b801911h
84. Jastrzebski, W; Sitarz, M; Rokita, M; Bulat, K Infrared Spectroscopy of different Phosphates Structures Spectrochim Acta, Part A 2011, 79, 722–727, 101016/jsa201008044
85. Brodard-Severac, F; Guerrero, G; Maquet, J; Florian, P; Gervais, C; Mutin, P H High-Field 17O MAS NMR Investigation of Phosphonic Acid Monolayers on Titani Chem Mater 2008, 20, 5191–5196, 101021/cm8012683
86. Brice-Profeta, S; Arrio, M ; Tronc, E; Menguy, N; Letard, I; CartierditMoulin, C; Noguès, M; Chanéac, C; Jolivet, J P; Saintavit, P Magnetic Order in g-Fe<sub>2</sub>O<sub>3</sub> Nanoparticles: A XMCD Study J Magn Magn Mater 2005, 288, 354–365, 101016/jmmm200409120
87. Tronc, E; Ezzir, ; Cherkaoui, R; Chanéac, C; Noguès, M; Kachkachi, H; Fiorani, D; Testa, M; Grenèche, J M; Jolivet, J P Surface-Related Properties of g-Fe<sub>2</sub>O<sub>3</sub> Nanoparticles J Magn Magn Mater 2000, 221, 63–79, 101016/S0304-8853(00)00369-3
88. Yee, C; Kataby, G; Ulman, ; Prozorov, T; White, H; King, ; Rafailovich, M; Sokolov, J; Gedanken, Self-Assembled Monolayers of Alkanesulfonic and -phosphonic Acids on Amorphous Iron Oxide Nanoparticles Langmuir 1999, 15, 7111–7115, 101021/la990663y
89. Jolivet, J P; Chaneac, C; Tronc, E Iron Oxide Chemistry From Molecular Clusters to Extended Solid Networks Chem Commun 2004, 481–487, 101039/B304532N
90. Campbell, V E; Tonelli, M; Cimatti, I; Moussy, J B; Tortech, L; Dappe, Y J; Riviere, E; Guillot, R; Delprat, S; Mattana, R; Sensor, P; Ohresser, P; Choueikani, F; Otero, E; Koprowiak, F; Chilkuri, V G; Suaud, N; Guihery, N; Galtayries, ; Miserque, F; Arrio, M ; Saintavit, P; Mallah, T Engineering the Magnetic Coupling and Anisotropy at the Molecule-Magnetic Surface Interface in Molecular Spintronic Devices Nat Commun 2016, 7, 13646–10, 101038/ncomms13646
91. Pabisaki, T; Winiarski, M J; Ossowski, T; Kiejna, Adsorption of Gold Subnano-Structures on a Magnetite (111) Surface and their Interaction with CO Phys Chem Chem Phys 2016, 18, 18169–18179, 101039/C6CP03222B
92. Gomes, R; Hassinen, ; Szczygiel, ; Zhao, Q; Vantomme, ; Martins, J C; Hens, Z Binding of Phosphonic Acids to CdSe Quantum Dots: A Solution NMR Study J Phys Chem Lett 2011, 2, 145–152, 101021/jz1016729
93. Chun, Y-J; Park, J-N; Oh, G-M; Hong, S-I; Kim, Y-J Synthesis of ω-Phthalimidoalkylphosphonates Synthesis 1994, 1994, 909–910, 101055/s-1994-25599
94. Heidari, C Brown, "Study of Composition and Morphology of Cadmium Oxide (CdO) Nanoparticles for Eliminating Cancer Cells", J Nanomed Res, Volume 2, Issue 5, 20 Pages, 2015
95. Heidari, C Brown, "Study of Surface Morphological, Phytochemical and Structural Characteristics of Rhodium (III) Oxide (Rh<sub>2</sub>O<sub>3</sub>) Nanoparticles", International Journal of Pharmacology, Phytochemistry and Ethnomedicine, Volume 1, Issue 1, Pages 15–19, 2015
96. Heidari, "An Experimental Biospectroscopic Study on Seminal Plasma in Determination of Semen Quality for Evaluation of Male Infertility", Int J Adv Technol 7: e007, 2016
97. Heidari, "Extraction and Preconcentration of N-Tolyl-Sulfonyl-Phosphoramid-Sacure-Dichlorid as an Anti-Cancer Drug from Plants: A Pharmacognosy Study", J Pharmacogn Nat Prod 2: e103, 2016
98. Heidari, "A Thermodynamic Study on Hydration and Dehydration of DNA and RNA-Amphiphile Complexes", J Bioeng Biomed Sci S: 006, 2016
99. Heidari, "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 5: e142, 2016
100. Heidari, "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 5: e146, 2016
101. Heidari, "Future Prospects of Point Fluorescence Spectroscopy, Fluorescence Imaging and Fluorescence Endoscopy in Photodynamic Therapy (PDT) for Cancer Cells", J Bioanal Biomed 8: e135, 2016

102. Heidari, "A Bio-Spectroscopic Study of DNA Density and Color Role as Determining Factor for Absorbed Irradiation in Cancer Cells", *Adv Cancer Prev* 1: e102, 2016
103. Heidari, "Manufacturing Process of Solar Cells Using Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh<sub>2</sub>O<sub>3</sub>) Nanoparticles", *J Biotechnol Biomater* 6: e125, 2016
104. Heidari, "A Novel Experimental and Computational Approach to Photobiosimulation of Telomeric DNA/RNA: A Biospectroscopic and Photobiological Study", *J Res Development* 4: 144, 2016
105. Heidari, "Biochemical and Pharmacodynamical Study of Microporous Molecularly Imprinted Polymer Selective for Vancomycin, Teicoplanin, Oritavancin, Telavancin and Dalbavancin Binding", *Biochem Physiol* 5: e146, 2016
106. Heidari, "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* 4: 1, 2016
107. Heidari, "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* 4: 2, 2016
108. Heidari, "Simulation of Temperature Distribution of DNA/RNA of Human Cancer Cells Using Time-Dependent Bio-Heat Equation and Nd: YAG Lasers", *Arch Cancer Res* 4: 2, 2016
109. Heidari, "Quantitative Structure-Activity Relationship (QSAR) Approximation for Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh<sub>2</sub>O<sub>3</sub>) 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* 4: 1, 2016
110. Heidari, "Biomedical Study of Cancer Cells DNA Therapy Using Laser Irradiations at Presence of Intelligent Nanoparticles", *J Biomedical Sci* 5: 2, 2016
111. Heidari, "Measurement the Amount of Vitamin D2 (Ergocalciferol), Vitamin D3 (Cholecalciferol) and Absorbable Calcium (Ca<sup>2+</sup>), Iron (II) (Fe<sup>2+</sup>), Magnesium (Mg<sup>2+</sup>), Phosphate (PO<sub>4</sub><sup>-</sup>) and Zinc (Zn<sup>2+</sup>) in Apricot Using High-Performance Liquid Chromatography (HPLC) and Spectroscopic Techniques", *J Biom Biostat* 7: 292, 2016
112. Heidari, "Spectroscopy and Quantum Mechanics of the Helium Dimer (He<sub>2</sub><sup>+</sup>), Neon Dimer (Ne<sub>2</sub><sup>+</sup>), Argon Dimer (Ar<sub>2</sub><sup>+</sup>), Krypton Dimer (Kr<sub>2</sub><sup>+</sup>), Xenon Dimer (Xe<sub>2</sub><sup>+</sup>), Radon Dimer (Rn<sub>2</sub><sup>+</sup>) and Ununoctium Dimer (Uuo<sub>2</sub><sup>+</sup>) Molecular Cations", *Chem Sci J* 7: e112, 2016
113. Heidari, "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* 7: e129, 2016
114. Heidari, "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)* 5: 207, 2016
115. Heidari, "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* 2: 1, 2016
116. Heidari, "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* 2: 113, 2016
117. Heidari, "A Chemotherapeutic and Biospectroscopic Investigation of the Interaction of Double-Standard DNA/RNA-Binding Molecules with Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh<sub>2</sub>O<sub>3</sub>) Nanoparticles as Anti-Cancer Drugs for Cancer Cells' Treatment", *Chemo Open Access* 5: e129, 2016
118. Heidari, "Pharmacokinetics and Experimental Therapeutic Study of DNA and Other Biomolecules Using Lasers: Advantages and Applications", *J Pharmacokinet Exp Ther* 1: e005, 2016
119. Heidari, "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* 2: 1, 2016
120. Heidari, "Discriminate between Antibacterial and Non-Antibacterial Drugs Artificial Neural Networks of a Multilayer Perceptron (MLP) Type Using a Set of Topological Descriptors", *J Heavy Met Toxicity Dis* 1: 2, 2016
121. Heidari, "Combined Theoretical and Computational Study of the Belousov-Zhabotinsky Chaotic Reaction and Curtius Rearrangement for Synthesis of Mechlorethamine, Cisplatin, Streptozotocin, Cyclophosphamide, Melfphalan, Busulphan and BCNU as Anti-Cancer Drugs", *Insights Med Phys* 1: 2, 2016
122. Heidari, "A Translational Biomedical Approach to Structural Arrangement of Amino Acids' Complexes: A Combined Theoretical and Computational Study", *Transl Biomed* 7: 2, 2016
123. Heidari, "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* 6: e144, 2016
124. Heidari, "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* 5: e111, 2016
125. Heidari, "Synthesis and Study of 5-[(Phenylsulfonyl)Amino]-1,3,4-Thiadiazole-2-Sulfonamide as Potential Anti-Pertussis Drug Using Chromatography and Spectroscopy Techniques", *Transl Med (Sunnyvale)* 6: e138, 2016
126. Heidari, "Nitrogen, Oxygen, Phosphorus and Sulphur Heterocyclic Anti-Cancer Nano Drugs Separation in the Supercritical Fluid of Ozone (O<sub>3</sub>) Using Soave-Redlich-Kwong (SRK) and Peng-Robinson (PR) Equations", *Electronic J Biol* 12: 4, 2016
127. Heidari, "An Analytical and Computational Infrared Spectroscopic Review of Vibrational Modes in Nucleic Acids", *Austin J Anal Pharm Chem* 3 (1): 1058, 2016
128. Heidari, C Brown, "Phase, Composition and Morphology Study and Analysis of Os-Pd/HfC Nanocomposites", *Nano Res Appl* 2: 1, 2016
129. Heidari, C Brown, "Vibrational Spectroscopic Study of Intensities and Shifts of Symmetric Vibration Modes of Ozone Diluted by Cumene", *International Journal of Advanced Chemistry*, 4 (1) 5-9, 2016
130. Heidari, "Study of the Role of Anti-Cancer Molecules with Different Sizes for Decreasing Corresponding Bulk Tumor Multiple Organs or Tissues", *Arch Can Res* 4: 2, 2016
131. Heidari, "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* 7: e125, 2016
132. Heidari, "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* 7: e153, 2016
133. Heidari, "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* 7: 2, 2016
134. Heidari, "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* 4: 2, 2016
135. Heidari, "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* 1: 3, 2016
136. Heidari, "Linear and Non-Linear Quantitative Structure-Anti-Cancer-Activity Relationship (QSACAR) Study of Hydrous Ruthenium (IV) Oxide (RuO<sub>2</sub>) Nanoparticles as Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) and Anti-Cancer Nano Drugs", *J Integr Oncol* 5: e110, 2016
137. Heidari, "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* 1: e101, 2016
138. Heidari, "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* 8: 007-008, 2016
139. Heidari, "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* 4: e161, 2016
140. Heidari, "Nanotechnology in Preparation of Semipermeable Polymers", *J Adv Chem Eng* 6: 157, 2016



141. Heidari, "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* 6: e119, 2016
142. Heidari, "DNA/RNA Fragmentation and Cytolysis in Human Cancer Cells Treated with Diphthamide Nano Particles Derivatives", *Biomedical Data Mining* 5: e102, 2016
143. Heidari, "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* 1: 1, 2016
144. Heidari, "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* 5: 282, 2016
145. Heidari, "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* 5: e143, 2016
146. Heidari, "The Impact of High Resolution Imaging on Diagnosis", *Int J Clin Med Imaging* 3: 1000e101, 2016
147. Heidari, "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* 1: 2, 2016
148. Heidari, "Advances in Logic, Operations and Computational Mathematics", *J Appl Computat Math* 5: 5, 2016
149. Heidari, "Mathematical Equations in Predicting Physical Behavior", *J Appl Computat Math* 5: 5, 2016
150. Heidari, "Chemotherapy a Last Resort for Cancer Treatment", *Chemo Open Access* 5: 4, 2016
151. Heidari, "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* 2: e101, 2016
152. Heidari, "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* 1: 1, 2016
153. Heidari, "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* 3: 516, 2016
154. Heidari, "A Novel Approach to Biology", *Electronic J Biol* 12: 4, 2016
155. Heidari, "Innovative Biomedical Equipment's for Diagnosis and Treatment", *J Bioengineer & Biomedical Sci* 6: 2, 2016
156. Heidari, "Integrating Precision Cancer Medicine into Healthcare, Medicare Reimbursement Changes and the Practice of Oncology: Trends in Oncology Medicine and Practices", *J Oncol Med & Pract* 1: 2, 2016
157. Heidari, "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* 6: 3, 2016
158. Heidari, "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* 6: 1, 2017
159. Heidari, "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* 1: 2, 2017
160. Heidari, "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*, 6: 1, 2017
161. Heidari, "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* 4: 2, 2017
162. Heidari, "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] Nano Clusters as Anti-Cancer Nano Drugs", *J Nanomater Mol Nanotechnol*, 6: 3, 2017
163. Heidari, "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* 6: e103, 2017
164. Heidari, "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 Synchrotron Radiation", *J Dev Drugs* 6: e154, 2017
165. Heidari, "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* 7: e127, 2017
166. Heidari, "Opinion on Computational Fluid Dynamics (CFD) Technique", *Fluid Mech Open Acc* 4: 157, 2017
167. Heidari, "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* 1: 21, 2017
168. Heidari, "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)* 6: 1, 2017
169. Heidari, "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* 6: 170, 2017
170. Heidari, "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* 5: 2, 2017
171. Heidari, "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* 1: e103, 2017
172. Heidari, "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* 5: 305, 2017
173. Heidari, "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* 5: e117, 2017
174. Heidari, "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* 2 (2): 1-4, 2017
175. Heidari, "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*, 4 (3): 16, 2017

176. Heidari, "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*, 1: 1, 2017
177. Heidari, "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* 5: 1, 2017
178. Heidari, "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* 2 (1): 1-5, 2017
179. Heidari, "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* 4 (2): 1-5, 2017
180. R Gobato, Heidari, "Calculations Using Quantum Chemistry for Inorganic Molecule Simulation BeLi<sub>2</sub>SeSi", *Science Journal of Analytical Chemistry*, Vol 5, No 6, Pages 76-85, 2017
181. Heidari, "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 Vol 1 No 1*: 1, 2017
182. Heidari, "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*, Vol 4 No 1: 10, 2017
183. Heidari, "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*, 2 (3): 1-5, 2017
184. Heidari, "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)-v3, n4, (10-19) October 12, 2017*
185. Heidari, "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* 1 (1): 014-020, 2017
186. Heidari, "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* 6: 1, 2017
187. Heidari, "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* 1 (1) MADD000504 2017
188. Heidari, "Potency of Human Interferon  $\beta$ -1a and Human Interferon  $\beta$ -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* 6: 1, 2017
189. Heidari, "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* 4 (2): 1-5, 2017
190. Heidari, C Brown, "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* 1 (2): 061-069, 2017
191. Heidari, "High-Resolution Simulations of Human Brain Cancer Translational Nano Drugs Delivery Treatment Process under Synchrotron Radiation", *J Transl Res* 1 (1): 1-3, 2017
192. Heidari, "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*, 1 (1): 36-41, 2017
193. Heidari, "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* 1 (1): 067-0100, 2017
194. Heidari, "Visualizing Metabolic Changes in Probing Human Cancer Cells and Tissues Metabolism Using Vivo <sup>1</sup>H or Proton NMR, <sup>13</sup>C NMR, <sup>15</sup>N NMR and <sup>31</sup>P NMR Spectroscopy and Self-Organizing Maps under Synchrotron Radiation", *SOJ Mater Sci Eng* 5 (2): 1-6, 2017
195. Heidari, "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* 4 (2): e001, 2017
196. Heidari, "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*, 3 (4): 079-084, 2017
197. Heidari, "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* 4 (2): e001, 2017
198. Heidari, "Overview of the Role of Vitamins in Reducing Negative Effect of Decapeptyl (Triptorelin Acetate or Pamote 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* 1 (1): 021-026, 2017
199. Heidari, "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* 4 (3): 1091, 2017
200. Heidari, "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* 2 (2): 77-83, 2017
201. Heidari, "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*, 1: 2, e001, 2017
202. Heidari, "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* 4 (2): 1-8, 2017
203. Heidari, "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* 1 (1): 12-17, 2017
204. Heidari, "Vibrational Decihertz (dHz), Centihertz (cHz), Millihertz (mHz), Microhertz ( $\mu$ Hz), 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*, 7 (4), 335-340, 2017
205. Heidari, "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*, 2 (5), 239-246, 2017
206. Heidari, "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*, 3: 3, 045-052, 2017
207. Heidari, "J-Spectroscopy, Exchange Spectroscopy (EXSY), Nuclear 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*, 1 (2): 006-013, 2017



208. Heidari, "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*, 1: 103–107, 2017
209. Heidari, "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*, 2 (1): 41–46, 2017
210. Heidari, "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* 6 (1): 101, 2018
211. Heidari, "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*, Volume 3, Issue 1, Pages 1–6, 2018
212. Heidari, "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*, 3 (1): 1011, 2018
213. Heidari, "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*, 1 (1): 18–24, 2017
214. Heidari, "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*, 2 (1): 00026–00032, 2018
215. M R R Gobato, R Gobato, Heidari, "Planting of Jaboticaba Trees for Landscape Repair of Degraded Area", *Landscape Architecture and Regional Planning*, Vol 3, No 1, 2018, Pages 1–9, 2018
216. Heidari, "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*, 4 (1): 1018, 2018
217. Heidari, "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*, 2 (1): 1–14, 2018
218. Heidari, "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*; 2 (1): 1–14, 2018
219. Heidari, "Correlation Two-Dimensional Nuclear Magnetic Resonance (NMR) (2D-NMR) (COSY) Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", *EMS Can Sci*, 1–1–001, 2018
220. Heidari, "Thermal Spectroscopy, Photothermal Spectroscopy, Thermal Microspectroscopy, Photothermal Microspectroscopy, Thermal Macroscopy and Photothermal Macroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation", *SM J Biometrics Biostat*, 3 (1): 1024, 2018
221. Heidari, "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* 1 (1), 2018
222. Heidari, "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*, 3 (1): 555603, 2018
223. Heidari, "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* 6 (1e): 1–5, 2018
224. Heidari, "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* 1 (3) GJEM 000514–000519, 2018
225. Heidari, "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* 1 (1): 002–008, 2018
226. Heidari, "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* 3 (1): 8, 2018
227. Heidari, "Investigation of Cancer Types Using Synchrotron Technology for Proton Beam Therapy: An Experimental Biospectroscopic Comparative Study", *European Modern Studies Journal*, Vol 2, No 1, 13–29, 2018
228. Heidari, "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* 5 (1): 001–007, 2018
229. Heidari, "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* 6 (2e): 1–6, 2018
230. Heidari, "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* 1 (1), 2018
231. Heidari, "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*, 2 (1): 1–12, 2018
232. Heidari, "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* 23: 17–20, 2018
233. Heidari, "Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation with the Passage of Time", *Organic & Medicinal Chem IJ* 6 (1): 555676, 2018
234. Heidari, "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* 2 (1): 001–007, 2018
235. Heidari, "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* 1 (1): 001–009, 2018
236. Heidari, "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* 1 (1): 1001, 2018
237. Heidari, "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* 1 (2): 1006, 2018
238. Heidari, "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* 5: 201, 2018
239. Heidari, "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* 25: 30–35, 2018
240. Heidari, "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*, Volume 1 (1): 1–10, 2018
  241. Heidari, "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
  242. Heidari, "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
  243. Heidari, "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* 5 (1): 1–9, 2018
  244. Heidari, "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*, 3 (2): 000138, 2018
  245. Heidari, "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* 5 (1): 1024, 2018
  246. Heidari, "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* 5 (3): 142–148, 2018
  247. Heidari, "Time-Dependent Vibrational Spectral Analysis of Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", *J Cancer Oncol*, 2 (2): 000124, 2018
  248. Heidari, "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* 3 (1), 2018
  249. R Gobato, Heidari, "Infrared Spectrum and Sites of Action of Sanguinarine by Molecular Mechanics and ab initio Methods", *International Journal of Atmospheric and Oceanic Sciences* Vol 2, No 1, pp 1–9, 2018
  250. Heidari, "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*, 2 (1): 000111, 2018
  251. Heidari, "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 Hesperitin, 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*, 2 (1): 007–014, 2018
  252. Heidari, "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*, Volume 3 (2): 1–14, 2018
  253. Heidari, "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* 23: 144–156, 2018
  254. Heidari, "Tetrakis [3, 5-bis (Trifluoromethyl) Phenyl] Borate (BARF)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Medical Research and Clinical Case Reports* 21: 113–126, 2018
  255. Heidari, "Sydnone, Münchnone, Montréalone, Mogone, Montelukast, Quebecol and Palau'amine-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Sur Cas Stud Op Acc J* 1 (3), 2018
  256. Heidari, "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*, Vol 4: Issue 1, Pages 1–19, 2018
  257. Heidari, R Gobato, "Putrescine, Cadaverine, Spermine and Spermidine-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Parana Journal of Science and Education (PJSE)-v4*, n5, (1–14) July 1, 2018
  258. Heidari, "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* 1 (1): 4–11, 2018
  259. Heidari, "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*, Vol 3, No 1, Pages 1–28, 2018
  260. R Gobato, Heidari, "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*, Vol 20 (1), 1–23, 2018
  261. Heidari, "Vibrational Biospectroscopic Studies on Anti-cancer Nanopharmaceuticals (Part I)", *Malaysian Journal of Chemistry*, Vol 20 (1), 33–73, 2018
  262. Heidari, "Vibrational Biospectroscopic Studies on Anti-cancer Nanopharmaceuticals (Part II)", *Malaysian Journal of Chemistry*, Vol 20 (1), 74–117, 2018
  263. Heidari, "Uranocene (U(C<sub>8</sub>H<sub>8</sub>)<sub>2</sub>) and Bis(Cyclooctatetraene)Iron (Fe(C<sub>8</sub>H<sub>8</sub>)<sub>2</sub> or Fe(COT)<sub>2</sub>)-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Chemistry Reports*, Vol 1, Iss 2, Pages 1–16, 2018
  264. Heidari, "Biomedical Systematic and Emerging Technological Study on Human Malignant and Benign Cancer Cells and Tissues Biospectroscopic Analysis under Synchrotron Radiation", *Glob Imaging Insights*, Volume 3 (3): 1–7, 2018
  265. Heidari, "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* 7(2) RDMS000659, 2018
  266. Heidari, "C<sub>70</sub>-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*, Volume 3 (3): 1–7, 2018
  267. Heidari, "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*, 6 (2) 140–156, 2018
  268. Heidari, "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*, 5 (7): 414–426, 2018
269. Heidari, "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*; 1 (1): 1–20, 2018
  270. Heidari, "Use of Molecular Enzymes in the Treatment of Chronic Disorders", *Canc Oncol Open Access J* 1 (1): 12–15, 2018
  271. Heidari, "Vibrational Biospectroscopic Study and Chemical Structure Analysis of Unsaturated Polyamides Nanoparticles as Anti-Cancer Polymeric Nanomedicines Using Synchrotron Radiation", *International Journal of Advanced Chemistry*, 6 (2), 167–189, 2018
  272. Heidari, "Adamantane, Irene, Naftazone and Pyridine-Enhanced Precatalyst Preparation Stabilization and Initiation (PEPSSI) Nano Molecules", *Madridge J Nov Drug Res* 2 (1): 61–67, 2018
  273. Heidari, "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*, 2 (1): 68–74, 2018
  274. Heidari, R Gobato, "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),  $\Delta^9$ -Tetrahydrocannabinol (THC) [(–)-trans- $\Delta^9$ -Tetrahydrocannabinol], Theobromine (Xanthose), Caffeine, Aspartame (APM) (NutraSweet) and Zidovudine (ZDV) [Azidothymidine (AZT)] as Anti-Cancer Nano Drugs by Coassembly of Dual Anti-Cancer Nano Drugs to Inhibit DNA/RNA of Human Cancer Cells Drug Resistance", *Parana Journal of Science and Education*, v 4, n 6, pp 1–17, 2018
  275. Heidari, R Gobato, "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*, v 4, n 6, pp 18–33, 2018
  276. R Gobato, Heidari, Mitra, "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* 3 (4) AOICMSID000167, 2018
  277. R Gobato, Heidari, Mitra, "Using the Quantum Chemistry for Genesis of a Nano Biomembrane with a Combination of the Elements Be, Li, Se, Si, C and H", *ResearchGate*, See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/326201181>, 2018
  278. R Gobato, Heidari, "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* 7 (4): 241–252, 2018
  279. Heidari, "Bastadins and Bastaranes-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Glob Imaging Insights*, Volume 3 (4): 1–7, 2018
  280. Heidari, "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*, Volume 3 (4): 1–8, 2018
  281. E Dadvar, Heidari, "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* 5: 228, 2018
  282. Heidari, R Gobato, "First-Time Simulation of Deoxyuridine Monophosphate (dUMP) (Deoxyuridylic Acid or Deoxyuridylate) and Vomitoxin (Deoxynivalenol (DON)) ((3 $\alpha$ ,7 $\alpha$ )-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*, Vol 4, No 6, pp 46–67, 2018
  283. Heidari, "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*, Volume 3 (4): 1–7, 2018
  284. Heidari, "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*, Volume 3 (4): 1–7, 2018
  285. Heidari, "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*, Volume 3 (5): 1–9, 2018
  286. Heidari, "Terphenyl-Based Reversible Receptor with Rhodamine, Rhodamine-Based Molecular Probe, Rhodamine-Based Using the Spirolactam Ring Opening, Rhodamine B with Ferrocene Substituent, CalixArene-Based Receptor, Thioether + Aniline-Derived Ligand Framework Linked to a Fluorescein Platform, Mercuryfluor-1 (Flourescent Probe), N,N'-Dibenzyl-1,4,10,13-Tetraraoxa-7,16-Diazacyclooctadecane and Terphenyl-Based Reversible Receptor with Pyrene and Quinoline as the Fluorophores-Enhanced Precatalyst Preparation Stabilization and Initiation (EPPSI) Nano Molecules", *Glob Imaging Insights*, Volume 3 (5): 1–9, 2018
  287. Heidari, "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*, Volume 3 (5): 1–10, 2018
  288. Heidari, "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*, Volume 3 (5): 1–7, 2018
  289. Heidari, "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*, Volume 3 (5): 1–7, 2018
  290. Heidari, "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*, Volume 1, Issue 1, Pages 01–10, 2018
  291. R Gobato, M R R Gobato, Heidari, Mitra, "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* 3 (5), Pages 402–409, 2018
  292. Heidari, "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*, Volume 5 (3): 1–8, 2018
  293. Heidari, "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*, Volume 3 (6): 1–8, 2018
  294. Heidari, "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*, Volume 3 (6): 1–8, 2018
  295. Heidari, "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*, Volume 3 (6): 1–8, 2018



296. Heidari, "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*, Volume 3 (6): 1-8, 2018
297. Heidari, "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*, Volume 3 (6): 1-8, 2018
298. Heidari, "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*, Volume 3 (6): 1-9, 2018
299. R Gobato, M R R Gobato, Heidari, Mitra, "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*, Vol 2, No 1, pp 9-17, 2018
300. Heidari, "Production of Electrochemiluminescence (ECL) Biosensor Using Os-Pd/HfC Nanocomposites for Detecting and Tracking of Human Gastroenterological Cancer Cells, Tissues and Tumors", *Int J Med Nano Res* 5: 1, 022-034, 2018
301. Heidari, "Enhancing the Raman Scattering for Diagnosis and Treatment of Human Cancer Cells, Tissues and Tumors Using Cadmium Oxide (CdO) Nanoparticles", *J Toxicol Risk Assess* 4: 1, 012-025, 2018
302. Heidari, "Human Malignant and Benign Human Cancer Cells and Tissues Biospectroscopic Analysis under Synchrotron Radiation Using Anti-Cancer Nano Drugs Delivery", *Integr Mol Med*, Volume 5 (5): 1-13, 2018
303. Heidari, "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*, Volume 5 (5): 1-8, 2018
304. Heidari, "Hadron Spectroscopy, Baryon Spectroscopy and Meson Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation", *Integr Mol Med*, Volume 5 (5): 1-8, 2018
305. R Gobato, M R R Gobato, Heidari, "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*, Volume 7, Number 1, Pages 14-35, 2019
306. Heidari, R Gobato, "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*, Volume 2 (1): 1-8, 2019
307. Heidari, R Gobato, "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*, Volume 2 (1): 1-8, 2019
308. Heidari, R Gobato, "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*, Volume 2 (1): 1-8, 2019
309. Heidari, R Gobato, "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*, Volume 2 (1): 1-8, 2019
310. Heidari, R Gobato, "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*, Volume 2 (1): 1-8, 2019
311. Heidari, R Gobato, "High-Resolution Mapping of DNA/RNA Hypermethylation and Hypomethylation Process in Human Cancer Cells, Tissues and Tumors under Synchrotron Radiation", *Trends in Res*, Volume 2 (2): 1-9, 2019
312. Heidari, "A Novel and Comprehensive Study on Manufacturing and Fabrication Nanoparticles Methods and Techniques for Processing Cadmium Oxide (CdO) Nanoparticles Colloidal Solution", *Glob Imaging Insights*, Volume 4 (1): 1-8, 2019
313. Heidari, "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*, Volume 4 (1): 1-8, 2019
314. Heidari, "Novel Experimental and Three-Dimensional (3D) Multiphysics Computational Framework of Michaelis-Menten Kinetics for Catalyst Processes Innovation, Characterization and Carrier Applications", *Glob Imaging Insights*, Volume 4 (1): 1-8, 2019
315. Heidari, "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*, Volume 4 (1): 1-8, 2019
316. Heidari, "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 113", *Glob Imaging Insights*, Volume 4 (1): 1-8, 2019
317. Heidari, "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*, Volume 4 (1): 1-9, 2019
318. R Gobato, M R R Gobato, Heidari, "Storm Vortex in the Center of Paraná State on June 6, 2017: A Case Study", *Sumerianz Journal of Scientific Research*, Vol 2, No 2, Pages 24-31, 2019
319. R Gobato, M R R Gobato, Heidari, "Attenuated Total Reflection-Fourier Transform Infrared (ATR-FTIR) Spectroscopy Study of the Nano Molecule C13H20BeLi2SeSi 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*, Vol 2, No 1, Pages 1-26, 2019
320. Heidari, "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* 1 (1): 01-17, 2019
321. R Gobato, M R R Gobato, Heidari, Mitra, "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* 8 (1): 1-6, 2019
322. Heidari, J Esposito, Caissutti, "The Importance of Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) and Raman Biospectroscopy 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* 2 (2): 1-21, 2019
323. Heidari, "Mechanism of Action and Their Side Effects at a Glance Prevention, Treatment and Management of Immune System and Human Cancer Nano Chemotherapy", *Nanosci Technol* 6 (1): 1-4, 2019
324. Heidari, J Esposito, Caissutti, "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* 5 (2): 071-084, 2019
325. Heidari, J Esposito, Caissutti, "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*, 3 (1): 150-170, 2019
326. Heidari, J Esposito, Caissutti, "Aplysatoxin 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*, 2 (2): 70-89, 2019
327. R Gobato, M R R Gobato, Heidari, Mitra, "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*, 2 (1): 9-17, 2018
328. Heidari, J Esposito, Caissutti, "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* 6 (04): 21-60, 2019

329. Heidari, "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* 3 (1): 1006-1019, 2019
330. Heidari, J Esposito, Caissutti, "Study of Anti-Cancer Properties of Thin Layers of Cadmium Oxide (CdO) Nanostructure", *Int J Analyt Bioanalyt Methods* 1 (1): 003-022, 2019
331. Heidari, J Esposito, Caissutti, "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*, 7 (1) 52-66, 2019
332. Heidari, "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)-v* 5, n 3, (1-23) May 2, 2019
333. Heidari, "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* 1 (1): 1002-1015, 2019
334. Heidari, J Esposito, Caissutti, "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* 2 (1): 113-129, 2019
335. Heidari, J Esposito, Caissutti, "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*, 4 (4): 174-194, 2019
336. R Gobato, M R R Gobato, Heidari, "Evidence of Tornado Storm Hit the Counties of Rio Branco do Ivaí and Rosario de Ivaí, Southern Brazil", *Sci Lett*, 7 (1): 32-40, 2019
337. M Jeyaraj, V Mahalingam, Indhuleka, P Sennu, M S Ho, Heidari, "Chemical Analysis of Surface Water Quality of River Noyyal Connected Tank in Tirupur District, Tamil Nadu, India", *Water and Energy International*, Volume 62r, Issue 1, pp 63-68, 2019
338. Heidari, J Esposito, Caissutti, "6-Methoxy-8-[[6-Methoxy-8-[[6-Methoxy-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-ol 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 Adv Phys Chem*, Volume 1, Issue 1, pp 1-6, 2019
339. Heidari, J Esposito, Caissutti, "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 Appl* 2 (3): 1-4, 2019
340. Heidari, J Esposito, Caissutti, "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*, Volume 2019, Issue 01, pp 1-24, 2019
341. Heidari, J Esposito, Caissutti, "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* 1 (1): 1-19, 2019
342. Heidari, "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*, 2 (1): 180010-180012, 2019
343. Heidari, J Esposito, Caissutti, "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*, Vol 1 Iss 2, Pages 1-5, 2019
344. R Gobato, M R R Gobato, Heidari, "Rhodochrosite as Crystal Oscillator", *Am J Biomed Sci & Res* 3 (2), 187, 2019
345. Heidari, J Esposito, Caissutti, "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*, Volume No: 2, Issue No: 3, Page Numbers 26-48, 2019
346. Heidari, J Esposito, Caissutti, "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*, 2 (2): 1-20, 2019
347. Heidari, J Esposito, Caissutti, "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*, Vol 21 (1), 70-95, 2019
348. Heidari, J Esposito, Caissutti, "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*, vol 7, no 1: 1-15, 2019
349. Heidari, J Esposito, Caissutti, "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 2: 03-07, 2019
350. Heidari, J Esposito, Caissutti, "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 2: 14-18, 2019
351. Heidari, J Esposito, Caissutti, "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 2: 19-23, 2019
352. Heidari, J Esposito, Caissutti, "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 2: 24-28, 2019
353. Heidari, J Esposito, Caissutti, "Hisirionicotoxin 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 1: 01-06, 2019
354. Heidari, J Esposito, Caissutti, "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 1: 07-12, 2019
355. Heidari, J Esposito, Caissutti, "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 1: 25-32, 2019
356. Heidari, J Esposito, Caissutti, "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 1: 13-18, 2019
357. Heidari, J Esposito, Caissutti, "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 1: 19-24, 2019
358. Heidari, J Esposito, Caissutti, "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 2: 02-07, 2019
359. Heidari, J Esposito, Caissutti, "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 2: 19-24, 2019
360. Heidari, J Esposito, Caissutti, "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* Vol 5, No 4, pp 1-28, 2019
361. Heidari, J Esposito, Caissutti, "Ochratoxin A, Ochratoxin B, Ochratoxin C, Ochratoxin  $\alpha$  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 2: 03-10, 2019

362. Heidari, J Esposito, Caissutti, "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 2: 11-16, 2019
363. Heidari, J Esposito, Caissutti, "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 2: 23-28, 2019
364. Heidari, J Esposito, Caissutti, "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 3: 01-05, 2019
365. Heidari, J Esposito, Caissutti, "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*, 57 (1), Pages: 21-32, 2019
366. Heidari, J Esposito, Caissutti, "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* 3 (6), 550-563, 2019
367. Heidari, J Esposito, Caissutti, "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* Vol 7, No 1, pp 18-27, 2019
368. R Gobato, M R R Gobato, Heidari, "Calculation by UFF Method of Frequencies and Vibrational Temperatures of the Unit Cell of the Rhodochrosite Crystal", *International Journal of Advanced Chemistry*, 7 (2) 77-81, 2019
369. Heidari, J Esposito, Caissutti, "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*, 7 (2) 82-96, 2019
370. Heidari, J Esposito, Caissutti, "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*, 2 (1) 17-54, 2019
371. Heidari, J Esposito, Caissutti, "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* vol1-iss2: jst1001, 1-16, 2019
372. R Gobato, M R R Gobato, Heidari, Mitra, "Rhodochrosite Optical Indicatrix", *Peer Res Nest* 1 (3) 1-2, 2019
373. Heidari, J Esposito, Caissutti, "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* 8 (2): 23-51, 2019
374. Heidari, J Esposito, Caissutti, "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* 2 (1): 1-21, 2019
375. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
376. Heidari, J Esposito, Caissutti, "6-Methoxy-8-[[6-Methoxy-8-[[6-Methoxy-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-ol 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*, Volume 2 (3): 1-14, 2019
377. Heidari, "Comparison of Synchrotron Radiation and Synchrocyclotron Radiation Performance in Monitoring of Human Cancer Cells, Tissues and Tumors", *Clin Case Studie Rep*, Volume 2 (3): 1-12, 2019
378. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
379. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
380. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
381. Heidari, J Esposito, Caissutti, "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* 6 (4): 364-377, 2019
382. Heidari, J Esposito, Caissutti, "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 2: 24-28, 2019
383. Heidari, J Esposito, Caissutti, "Histriocotoxin 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 1: 01-06, 2019
384. Heidari, J Esposito, Caissutti, "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 1: 07-12, 2019
385. Heidari, J Esposito, Caissutti, "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 1: 25-32, 2019
386. Heidari, J Esposito, Caissutti, "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 1: 13-18, 2019
387. Heidari, J Esposito, Caissutti, "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 1: 19-24, 2019
388. Heidari, J Esposito, Caissutti, "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 2: 02-07, 2019
389. Heidari, J Esposito, Caissutti, "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 2: 19-24, 2019
390. Heidari, J Esposito, Caissutti, "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* Vol 5, No 4, pp 1-28, 2019
391. Heidari, J Esposito, Caissutti, "Ochratoxin A, Ochratoxin B, Ochratoxin C, Ochratoxin  $\alpha$  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 2: 03-10, 2019
392. Heidari, J Esposito, Caissutti, "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 2: 11-16, 2019
393. Heidari, J Esposito, Caissutti, "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 2: 23-28, 2019
394. Heidari, J Esposito, Caissutti, "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 3: 01-05, 2019



395. Heidari, J Esposito, Caissutti, "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*, 57 (1), Pages: 21-32, 2019
396. Heidari, J Esposito, Caissutti, "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* 3 (6), 550-563, 2019
397. Heidari, J Esposito, Caissutti, "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* Vol 7, No 1, pp 18-27, 2019
398. R Gobato, M R R Gobato, Heidari, "Calculation by UFF Method of Frequencies and Vibrational Temperatures of the Unit Cell of the Rhodochrosite Crystal", *International Journal of Advanced Chemistry*, 7 (2) 77-81, 2019
399. Heidari, J Esposito, Caissutti, "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*, 7 (2) 82-96, 2019
400. Heidari, J Esposito, Caissutti, "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*, 2 (1) 17-54, 2019
401. Heidari, J Esposito, Caissutti, "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 vol1-iss2: jst1001*, 1-16, 2019
402. R Gobato, M R R Gobato, Heidari, Mitra, "Rhodochrosite Optical Indicatrix", *Peer Res Nest* 1 (3) 1-2, 2019
403. Heidari, J Esposito, Caissutti, "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* 8 (2): 23-51, 2019
404. Heidari, J Esposito, Caissutti, "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* 2 (1): 1-21, 2019
405. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
406. Heidari, J Esposito, Caissutti, "6-Methoxy-8-[[6-Methoxy-8-[[6-Methoxy-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-yl]Oxy]-2-Methyl-1-(2-Methylpropyl)-3,4-Dihydro-1H-Isoquinolin-7-ol 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*, Volume 2 (3): 1-14, 2019
407. Heidari, "Comparison of Synchrotron Radiation and Synchrocyclotron Radiation Performance in Monitoring of Human Cancer Cells, Tissues and Tumors", *Clin Case Studie Rep*, Volume 2 (3): 1-12, 2019
408. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
409. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
410. Heidari, J Esposito, Caissutti, "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*, Volume 2 (3): 1-14, 2019
411. Heidari, J Esposito, Caissutti, "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* 6 (4): 364-377, 2019
412. R Gobato, M R R Gobato, Heidari, Mitra, "Hartree-Fock Methods Analysis Protonated Rhodochrosite Crystal and Potential in the Elimination of Cancer Cells through Synchrotron Radiation", Vol 5, No 3, pp 27-36, 2019
413. R Gobato, I K K Dosh, Heidari, Mitra, M R R Gobato, "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* 3 (2): 1-2, 2019
414. R Gobato, M R R Gobato, Heidari, Mitra, "Unrestricted Hartree-Fock Computational Simulation in a Protonated Rhodochrosite Crystal", *Phys Astron Int J* 3 (6):220-228, 2019
415. Heidari, K Schmitt, M Henderson, E Besana, "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 120", *Journal of Energy Conservation*, Volume 1, Issue 2, Pages 46-73, 2019
416. Heidari, K Schmitt, M Henderson, E Besana, "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*, 1 (1), 17-44, 2019
417. Heidari, K Schmitt, M Henderson, E Besana, "Investigation of Interaction between Synchrotron Radiation and Thulium Nanoparticles for Human Cancer Cells, Tissues and Tumors Treatment", *European Journal of Scientific Exploration*, Volume 2, Issue 3, Pages 1-8, 2019
418. Heidari, K Schmitt, M Henderson, E Besana, "The Effectiveness of the Treatment Human Cancer Cells, Tissues and Tumors Using Darmstadtium Nanoparticles and Synchrotron Radiation", *International Journal of Advanced Engineering and Science*, Volume 9, Number 1, Pages 9-39, 2020
419. Heidari, K Schmitt, M Henderson, E Besana, "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*, 1 (2), 1-6, 2019
420. Heidari, K Schmitt, M Henderson, E Besana, "A New Approach to Interaction between Beam Energy and Erbium Nanoparticles", *Saudi J Biomed Res*, 4 (11): 372-396, 2019
421. Heidari, K Schmitt, M Henderson, E Besana, "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)*, 31 (6), 885-908, 2019
422. Heidari, K Schmitt, M Henderson, E Besana, "An Outlook on Optothermal Human Cancer Cells, Tissues and Tumors Treatment Using Lanthanum Nanoparticles under Synchrotron Radiation", *Journal of Materials Physics and Chemistry*, Vol 7, No 1, 29-45, 2019
423. Heidari, K Schmitt, M Henderson, E Besana, "Effectiveness of Einsteinium Nanoparticles in Optothermal Human Cancer Cells, Tissues and Tumors Treatment under Synchrotron Radiation", *Journal of Analytical Oncology*, 8, 1, 43-62, 2019
424. Heidari, K Schmitt, M Henderson, E Besana, "Study of Relation between Synchrotron Radiation and Dubnium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment Process", *Int Res J Applied Sci*, Volume 1, Number 4, Pages 1-20, 2019
425. Heidari, K Schmitt, M Henderson, E Besana, "A Novel Prospect on Interaction of Synchrotron Radiation Emission and Europium Nanoparticles for Human Cancer Cells, Tissues and Tumors Treatment", *European Modern Studies Journal*, 3 (5), 11-24, 2019
426. Heidari, K Schmitt, M Henderson, E Besana, "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*, 7 (2) 119-135, 2019
427. Heidari, K Schmitt, M Henderson, E Besana, "Role and Applications of Promethium Nanoparticles in Human Cancer Cells, Tissues and Tumors Treatment", *Scientific Modelling and Research*, 4 (1): 8-14, 2019
428. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-13, 2019

429. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-14, 2019
430. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-14, 2019
431. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-14, 2019
432. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-14, 2019
433. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-13, 2019
434. Heidari, J Esposito, Caissutti, "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* 4 (2), 1-14, 2019
435. Heidari, J Esposito, Caissutti, "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* 1 (2), 11-16, 2019
436. Heidari, J Esposito, Caissutti, "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* 3 (1), 1-13, 2019
437. Heidari, J Esposito, Caissutti, "Cyldrospermopsin 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* 3 (1), 1-14, 2019
438. Heidari, J Esposito, Caissutti, "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* 3 (1), 1-14, 2019
439. Heidari, K Schmitt, M Henderson, E Besana, "Investigation of Moscovium Nanoparticles as Anti-Cancer Nano Drugs for Human Cancer Cells, Tissues and Tumors Treatment", *Elixir Appl Chem* 137A, 53943-53963, 2019
440. Heidari, K Schmitt, M Henderson, E Besana, "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*, 6 (12): 34-62, 2019
441. Heidari, K Schmitt, M Henderson, E Besana, "Human Cancer Cells, Tissues and Tumors Treatment Using Dysprosium Nanoparticles", *Asian J Mat Chem* 4 (3-4), pp 47-51, 2019
442. Heidari, K Schmitt, M Henderson, E Besana, "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*, Volume 2 (4), Pages 1-19, 2019.