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

Alireza Heidari*

Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA

ABSTRACT
In the current study, we have experimentally and comparatively investigated and compared malignant human cancer cells, tissues and tumors before and after irradiating of synchrotron and synchrocyclotron radiations using Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Heteronuclear Single–Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple–Bond Correlation Spectroscopy (HMBC).

Key words: Clinical Pathology, Molecular Pathology, Biospecroscopy, Malignant and Benign Human Cancer Cells, Tissues and Tumors, Synchrotron Radiation, Synchrocyclotron Radiation, Large Hadron Collider (LHC), Proton and Helium Ion (Charged Particle) Beams, Oncology Radiotherapy

INTRODUCTION
In the current study, we have experimentally and comparatively investigated and compared malignant human cancer cells, tissues and tumors before and after irradiating of synchrotron and synchrocyclotron radiations using Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Heteronuclear Single–Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple–Bond Correlation Spectroscopy (HMBC). It is clear that malignant human cancer cells, tissues and tumors have gradually transformed to benign human cancer cells, tissues and tumors under synchrotron and synchrocyclotron radiations with the passage of time using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (Figures 1–5) [1–161].

MATERIALS, RESEARCH METHOD AND EXPERIMENTAL TECHNIQUES
In the current research, 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 was studied.
RESULTS AND DISCUSSION

Here, Correlation Spectroscopy (COSY), Exclusive Correlation Spectroscopy (ECOSY), Total Correlation Spectroscopy (TOCSY), Heteronuclear Single–Quantum Correlation Spectroscopy (HSQC) and Heteronuclear Multiple–Bond Correlation Spectroscopy (HMBC) analysis of malignant human cancer cells, tissues and tumors using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (a) before and (b) after irradiating of synchrotron and synchrocyclotron radiations in transformation process to benign human cancer cells, tissues and tumors with the passage of time was respectively presented (Figures 1–5).

Fig. 1 Correlation Spectroscopy (COSY) analysis of malignant human cancer cells, tissues and tumors using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (a) before and (b) after irradiating of synchrotron and synchrocyclotron radiations in transformation process to benign human cancer cells, tissues and tumors with the passage of time [1–161].

Fig. 2 Exclusive Correlation Spectroscopy (ECOSY) analysis of malignant human cancer cells, tissues and tumors using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (a) before and (b) after irradiating of synchrotron and synchrocyclotron radiations in transformation process to benign human cancer cells, tissues and tumors with the passage of time [1–161].


**Fig. 3** Total Correlation Spectroscopy (TOCSY) analysis of malignant human cancer cells, tissues and tumors using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (a) before and (b) after irradiating of synchrotron and synchrocyclotron radiations in transformation process to benign human cancer cells, tissues and tumors with the passage of time [1–161].

**Fig. 4** Heteronuclear Single–Quantum Correlation Spectroscopy (HSQC) analysis of malignant human cancer cells, tissues and tumors using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (a) before and (b) after irradiating of synchrotron and synchrocyclotron radiations in transformation process to benign human cancer cells, tissues and tumors with the passage of time [1–161].
CONCLUSIONS, PERSPECTIVES, USEFUL SUGGESTIONS AND FUTURE STUDIES

It can be concluded that malignant human cancer cells, tissues and tumors have gradually transformed to benign human cancer cells, tissues and tumors under synchrotron and synchrocyclotron radiations with the passage of time using cyclotron versus synchrotron, synchrocyclotron and the Large Hadron Collider (LHC) for delivery of proton and Helium ion (charged particle) beams for oncology radiotherapy (Figures 1–5).

REFERENCES


Alireza 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.


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


Alireza Heidari, “Measurement the Amount of Vitamin D2 (Ergocalciferol), Vitamin D3 (Cholecalciferol) and Absorbable Calcium (Ca²⁺), Iron (II) (Fe²⁺), Magnesium (Mg²⁺), Phosphate (PO₄³⁻) and Zinc (Zn²⁺) in Apricot Using High–Performance Liquid Chromatography (HPLC) and Spectroscopic Techniques”, J Biom Biomiat 7: 292, 2016.

Alireza Heidari, “Spectroscopy and Quantum Mechanics of the Helium Dimer (He₂⁰), Neon Dimer (Ne₂⁰), Argon Dimer (Ar₂⁰), Krypton Dimer (Kr₂⁰), Xenon Dimer (Xe₂⁰), Radon Dimer(Rn₂⁰) and Ununoctium Dimer (Uuo₂⁰) Molecular Cations”, Chem Sci J 7: e112, 2016.


Alireza Heidari, “Discriminate between Antibacterial and Non–Antibacterial Drugs Artificial Neutral Networks of a Multilayer Perceptron (MLP) Type Using a Set of Topological Descriptors”, J Heavy Met Toxicity Dis. 1: 2, 2016.


[37]. Alireza 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.


[74]. Alireza 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 Au_{125}(SR)_{40}, Au_{329-sAg_{2}(SR)_{34}, Au_{144}(SR)_{30}, Au_{80}(SR)_{36, Au_{120}(SR)_{16}, Au_{102}(SPb)_{24, Au_{30}(SPb)_{24, Au_{50}(SC-H_{2}Ph)_{24}, Au_{215}(SAdm)_{15, Au_{90}(pMBA)_{24 and Au_{125}(pMBA)_{16 Nano Clusters”}, J Surgery Emerg Med 1: 21, 2017.


[98]. Alireza Heidari, Christopher Brown, “Combinatorial Therapeutic Approaches to DNA/RNA and Benzylpenicillin (Penicillin G), Fluoxetine Hydrochloride (Prozac and Sarafem), Propofol (Diprivan), Acetylsalicylic Acid (ASA) (Aspirin), Naproxen Sod, 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.


[113]. Alireza Heidari, “Vibrational Decihertz (dHz), Centihertz (cHz), Millihertz (mHz), Microwhert (μHz), Nanohertz (nHz), Picohertz (pHz), Femtohertz (fHz), Attohertz (aHz), Zettahertz (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.


[118]. Alireza 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.


[121]. Alireza 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.


Heidari


Heidari


[157]. Alireza 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 Organometallic Chem Sci 3(1), 2018.


