Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

Alireza Heidari¹,²,³,⁴*, Elena Locci¹,²,³ and Silvia Raymond¹,²,³

¹Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA
²BioSpectroscopy Core Research Laboratory, California South University, 14731 Comet St. Irvine, CA 92604, USA
³Cancer Research Institute (CRI), California South University, 14731 Comet St. Irvine, CA 92604, USA
⁴American International Standards Institute, Irvine, CA 3800, USA

*Corresponding Author: Alireza Heidari, Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA, email id: Scholar.Researcher.Scientist@gmail.com; Alireza.Heidari@calsu.us; Central@aisi-usa.org

Received Date: Sep 16, 2021 / Accepted Date: Sep 30, 2021 / Published Date: Nov 03, 2021

Abstract
The team first screened a set of protein mimics originally designed to target Alzheimer's disease and type 2 diabetes. The results identify a mimicry of the protein that potentially isolates the mutated p53 material and prevents further protein accumulation. The researchers then showed that segregation of mutated p53 grains by protein mimicking restored the suppressive function of the p53 tumor, leading to the death of a wide range of cancer cells. Importantly, protein mimicry therapy effectively reduces tumors that contain mutated p53 while showing no significant toxins for healthy tissue, resulting in significantly longer survival. "As the prevalence of cancer increases worldwide, there is an urgent need for new cancer therapies to complement or replace existing therapies," said the study's lead author. Here we show the first successful use of a small molecule amyloid inhibitor as an anticancer agent. We believe that this will have a far-reaching impact, as it effectively bridges the gap between amyloid disease and cancer and is the basis for passing on information approaches in the design of new and robust cancer mutation therapies for the p53 mutation.

Keywords: Cancer; Cells; Tissues, Tumors; Prevention, Prognosis; Diagnosis; Imaging; Screening; Treatment; Management


Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. Copyright © 2021; Alireza Heidari

Introduction
CAR-T cell therapy is a type of immunotherapy that involves inhibiting the strength of a person's immune system by engineering their T cells to identify and kill cancer cells. The Food and Drug Administration approved the first CAR-T cell treatment for myeloma in March. Today we are working to treat another potential CAR-T cell for multiple myeloma. The CARTITUDE-1 study is a stage IB / II clinical trial. The trial targeted B-cell maturation antigen by targeting CAR-T cell therapy in

www.raftpubs.com
patients with multiple myeloma who had received at least three previous lines of treatment with standard drugs, including proteasome inhibitors, immunosuppressive drugs, and CD38 antibodies. Tested. Cilta-cel is made from the patient's own T cells, which is genetically engineered and is given as a single injection. The overall response rate to treatment was 97%, while the complete response rate and progression-free survival rate were 67% and 77%, respectively. The overall survival rate was 89%. Updates to this study were recently presented at the annual meeting of the American Clinical Oncology Association after our paper was accepted for publication in The Lancet. Our ASCO presentation showed a deeper response for patients receiving this treatment. These results are very impressive for patients with myeloma who have already undergone many treatment lines for their disease. It will be important to better understand the clinical features of patients who have experienced long-term recovery from this treatment and the mechanisms by which patients’ relapse. While it is not possible to formally conduct two separate single-arm studies on the idea of cells and cilia, the rate of dramatic response and progression-free survival of eyelash-treated patients is very interesting. The potential translation of this research into an individual clinical treatment requires the resolution of many logistical details, including ensuring the reliability of the transfer from production for research to a commercial product [1-510].

Results and Discussion

Ketogenic metabolic therapy (KMT) based on ketogenic diets is considered as a potential option or adjunctive therapy for disease control, brain tumor progression. This type of treatment is a non-toxic, complementary or alternative diet that uses low-carb, high-fat diets to treat a variety of malignancies, including glioblastoma. This has been important for people suffering from epilepsy. In addition to the ketogenic diet, the vital role of metabolism in the health and disease of the central nervous system and throughout the body is well known. New studies have shown that using personal metabolism to fight some tumors may be helpful. After adopting a ketogenic diet, a patient showed that he had refused treatment for his brain tumor and had developed a fatal glioblastoma tumor. Glioblastoma (GBM) is a rapidly growing brain tumor also known as grade 4 astrocytoma, which penetrates the tissues around the brain and kills approximately 15,000 people annually and is incurable. According to the researchers, the survival time after GBM has not yet increased significantly, despite changes in treatment standards and the development of new safe therapies. GBM, like malignant tumors, depends on the simultaneous restriction of fermentable fuels such as glucose and glutamine for energy synthesis and survival.

Conclusions

The cell cycle of such a subject has been thoroughly studied, yet here we are examining for the second time that we have entered a new phase; Biology always has new insights to show us. This data was amazing. This map is based on this beautiful circular pattern that we have identified as all the different stages of the cell cycle. Have a disease. When Placer and colleagues used the ccAF tool to analyze cell data for glioma tumors, we found that tumor cells were often in the G0 or G1 nerve growth state. With tumor aggression, fewer cells remain at rest in the G0 nerve state. This means that more cells are growing and growing in the tumor.

Acknowledgment

This study was supported by the Cancer Research Institute (CRI) Project of Scientific Instrument and Equipment Development, the National Natural Science Foundation of the United States, the International Joint Bio Spectroscopy Core Research Laboratory
Program supported by the California South University (CSU), and the Key project supported by the American International Standards Institute (AISI), Irvine, California, USA.

References

18. Heidari A. 2016. Measurement the Amount of Vitamin D2 (Ergocalciferol), Vitamin D3 (Cholecalciferol) and Absorbable Calcium (Ca\textsuperscript{2+}), Iron (II) (Fe\textsuperscript{2+}), Magnesium (Mg\textsuperscript{2+}), Phosphate (PO\textsuperscript{4-}) and Zinc (Zn\textsuperscript{2+}) in Apricot Using High-Performance Liquid Chromatography (HPLC) and Spectroscopic Techniques. J Biom Biomastat. 7: 292.
19. Heidari A. 2016. Spectroscopy and Quantum Mechanics of the Helium Dimer (He\textsuperscript{2+}), Neon Dimer (Ne\textsuperscript{2+}), Argon Dimer (Ar\textsuperscript{2+}), Krypton Dimer (Kr\textsuperscript{2+}), Xenon Dimer (Xe\textsuperscript{2+}), Radon Dimer (Rn\textsuperscript{2+}) and Ununoctium Dimer (Uuo\textsuperscript{2+}) Molecular Cations. Chem Sci J. 7: 112.
24. Heidari A. 2016. A Chemotherapeutic and Biospectroscopic Investigation of the Interaction of Double-Standard DNA/RNA-Binding Molecules with Cadmium Oxide (CdO) and Rhodium (III) Oxide (Rh\textsubscript{2}O\textsubscript{4}) Nanoparticles as Anti-Cancer Drugs for Cancer Cells’ Treatment. Chem Open Access 5: 129.
27. Heidari A. 2016. 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.
Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014

System Nano Drugs under Synchrotron Radiations. J Gastrointest Dig Syst. 6: 119.


52. Heidari A. 2016. 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: 143.


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014

JCA: November-2021: Page No: 198-236

Page: 204

www.raftpubs.com


82. Heidari A. 2017. 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 Polyamiline (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: 16.


91. Heidari A. 2017. Investigation of Medical, Medicinal, Clinical and Pharmaceutical Applications of Estradiol, Mestranol (Norlutin), Norethindrone (NET), Norethisterone Acetate (NETA), Norethisterone Enanthate (NETE) and...


Comparative Study on Malignant and Benign Human Cancer Cells and Tissues with the Passage of Time under Synchrotron Radiation. Int J Hepatol Gastroenterol. 3: 079-084.


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


116. Heidari A. 2017. Vibrational Decahertz (daHz), Hectohertz (hHz), Kilohertz (kHz), Megahertz (MHz), Gigahertz (GHz), Terahertz (THz), Petahertz (PHz), Exahertz (EHz),


119. Heidari A. 2018. 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: 1011.


129. Heidari A. 2018. 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...


152. Heidari A. 2018. Heteronuclear Correlation Experiments such as Heteronuclear Single-Quantum Correlation Spectroscopy (HSQC), Heteronuclear Multiple-Quantum Correlation Spectroscopy (HMQC) and
Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014

JCA: November-2021: Page No: 198-236


165. Heidari A. 2018. 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: 4-11.


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


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014


186. Heidari A. 2018. 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. 3: 1-8.


188. Heidari A, Gobato R. 2018. First-Time Simulation of Deoxyuridine Monophosphate (dUMP) (Deoxyuridylic Acid or Deoxyuridylate) and Vomitoxin (Deoxyxinalenol (DON)) ((3α,7α)-3,7,15-Trihydroxy-12,13-Epoxytrichothe-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. 4: 46-67.

189. Heidari A. 2018. Buckminsterfullerene (Fullerene), Bullvalene, Dickite and Josiphos Ligands Nano Molecules Incorporation into the Nano Polymeric Matrix (NPME) 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. 3: 1-7.


197. Gobato R, Gobato MRR, Heidari A, et al. 2018. Spectroscopy and Dipole Moment of the Molecule C_{3}H_{2}BeLiSeSi via Quantum Chemistry Using Ab Initio, Hartree-Fock Method in the Base Set CC-pVTZ and 6-
204. Heidari A. 2018. 2-Amino-9-(1S, 3R, 4R)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclo pentyl)-1H-Purin-6(9H)-One, 2-Amino-9-(1R, 3R, 4R)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclo pentyl)-1H-Purin-6(9H)-One, 2-Amino-9-(1S, 3R, 4S)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclo pentyl)-1H-Purin-6(9H)-One and 2-Amino-9-(1S, 3R, 4S)-4-Hydroxy-3-(Hydroxymethyl)-2-Methylenecyclo pentyl)-1H-Purin-6(9H)-One-Enhanced Precatalyst Preparation Stabilization and Initiation Nano Molecules. Glob Imaging Insights. 3: 1-9.
221. Heidari A. 2019. The Hydrolysis Constants of Copper (I) (Cu$^+$) and Copper (II) (Cu$^{2+}$) in Aqueous Solution as a Function of pH Using a Combination of pH Measurement and Biospectroscopic Methods and Techniques. Glob Imaging Insights. 4: 1-8.
the Nano Molecule C_{13}H_{20}BeLi_{2}SeSi 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. 2: 1-26.


238. Heidari A. 2019. 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: 1002-1015.


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014

JCA: November-2021: Page No: 198-236

Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer

DOI: https://doi.org/10.36811/jca.2021.110014

Journal of Advanced Engineering and Science. 10: 20-64.


488. Heidari A, Hotz M, MacDonald N, et al. 2021. Active Targeting of Rhenium (IV) Oxide (ReO₂), Rhenium Trioxide (ReO₃) and Rhenium (VII) Oxide (Re₂O₇) Nanoparticles as Cancer Therapeutics Swell-up to Kill Cancer Cells under Synchrotron and Synchrocyclotron Radiations.
Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer


Targeting the Prion-Like Aggregation of Mutant p53 to Combat Cancer


Authors’ Brief Biographies

Prof. Dr. Iireza Heidari, Ph.D., D.Sc. is a Full Distinguished Professor and Academic Tenure of Chemistry and also Enrico Fermi Distinguished Chair in Molecular Spectroscopy at California South University (CSU), Irvine, California, USA. He has got his Ph.D. and D.Sc. degrees from California South University (CSU), Irvine, California, USA. Furthermore, he has double postdocs in Project Management, Oncology, Human Cancer Tissues and Synchrotron Radiation from Monash University, Melbourne, Victoria, Australia and also in Nano chemistry and Modern Molecular Electronic-Structure Computations Theory from California South University (CSU), Irvine, California, USA. His research interests include Biophysical Chemistry, Biomolecular and Biomedical Spectroscopy, Quantum Chemistry, Nano chemistry, Modern Electronic Structure Computations, Theoretical Chemistry, Mathematical Chemistry, Computational Chemistry, Vibrational Spectroscopy, Molecular Modelling, Ab initio & Density Functional Methods, Molecular Structure, Biochemistry, Molecular Simulation, Pharmaceutical Chemistry, Medicinal Chemistry, Oncology, Synchrotron Radiation, Synchrocyclotron Radiation, LASER, Anti-Cancer Nano Drugs, Nano Drugs Delivery, ATR-FTIR Spectroscopy, Raman Spectroscopy, Intelligent Molecules, Molecular Dynamics, Biosensors, Biomarkers, Molecular Diagnostics, Numerical Chemistry, Nucleic Acids, DNA/RNA Monitoring, DNA/RNA Hypermethylation & Hypomethylation, Human Cancer Tissues, Human Cancer Cells, Tumors, Cancer Tissues, Cancer Cells, etc. He has participated at more than five hundred reputed international conferences, seminars, congresses, symposiums and forums around the world as yet. Also, he possesses many published articles in Science Citation Index (SCI)/International Scientific Indexing (ISI), Medline/PubMed and Scopus Journals. It should be noted that he has visited many universities or scientific and academic research institutes in different countries such as United States, United Kingdom, Canada, Australia, New Zealand, Scotland, Ireland, Netherlands, Belgium, Denmark, Luxembourg, Romania, Greece, Russia, Estonia, Ukraine, Turkey, France, Swiss, Germany, Sweden, Norway, Italy, Austria, Czech Republic, Hungary, Poland, South Africa, Egypt, Brazil, Spain, Portugal, Mexico, Japan, Singapore, Malaysia, Indonesia, Thailand, Taiwan, Hong Kong, Philippines, South Korea, China, India, Kingdom of Saudi Arabia, Jordan, Qatar,

www.raftpubs.com
United Arab Emirates, etc. as research fellow, sabbatical and volunteer researcher or visitor and so on heretofore. He has a history of several years of teaching for college students and various disciplines and trends in different universities. Moreover, he has been a senior advisor in various industry and factories. He is expert in many computer programs and programming languages. Hitherto, he has authored more than twenty books and book chapters in different fields of Chemistry. Syne, he has been awarded more than one thousand reputed international awards, prizes, scholarships and honors. Heretofore, he has multiple editorial duties in many reputed international and peer-reviewed journals, books and publishers. Hitherward, he is a member of more than five hundred reputed international academic-scientific-research institutes around the world. It should be noted that he is currently the President of the American International Standards Institute (AISI), Irvine, California, USA and also Head of Cancer Research Institute (CRI) and Director of the Bio Spectroscopy Core Research Laboratory at California South University (CSU), Irvine, California, USA.

Elena Loci is a Ph.D. Candidate under the Supervision of Professor Alireza Haidari at Cancer Research Institute (CRI) and Bio Spectroscopy Core Research Laboratory at California South University (CSU), Irvine, California, USA.

Dr. Silvia Raymond, Ph.D., D.Sc. is the current Junior Postdoctoral Research Fellows under the Supervision of Professor Alireza Haidari at Cancer Research Institute (CRI) and Bio Spectroscopy Core Research Laboratory at California South University (CSU), Irvine, California, USA.