Editorial

iMedPub Journals
http://www.imedpub.com

Archives in Cancer Research
ISSN 2254-6081

2016
Vol. 4 No. 1: 61

Anti-Cancer Effect of UV Irradiation at Presence of Cadmium Oxide (CdO) Nanoparticles on DNA of Cancer Cells: A Photodynamic Therapy Study

A Heidari

Faculty of Chemistry, California South University, USA

Corresponding author:
A Heidari

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

Scholar.Researcher.Scientist@gmail.com

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

Received: March 22, 2016; **Accepted:** March 24, 2016; **Published:** March 28, 2016

Editorial

Due to the extensive usage of anti-cancers, the spread of multi-drug resistant DNA of cancer cells is one of the most worrying threats to public health. In this editorial, the susceptibility of DNA of cancer cells to inactivation by a novel treatment, which involves applying appropriate UV irradiation at presence of Cadmium Oxide (CdO) nanoparticles on DNA of cancer cells, as a promising method for medical, clinical, biological, pharmaceutical, biochemical and photodynamic applications were analyzed.

A series of *in vitro* experiments have been designed to investigate DNA of cancer cells sensitivity to different anti-cancer agents such as UV irradiation and Cadmium Oxide (CdO) nanoparticles constructed by laser ablation and chemical reaction [1-4]. Different processes of Cadmium Oxide (CdO) nanoparticles production led to different size distribution and contact cross section; the nanoparticles with size distribution of 10 (nm) to 85 (nm) were used at this editorial.

UV irradiation and Cadmium Oxide (CdO) nanoparticles with concentration of several micromoles, which have produced through chemical reaction, was lonely eliminated DNA of cancer cells. Cadmium Oxide (CdO) nanoparticles that were produced by laser ablation have not any anti-cancer effect at high concentration. By coupling these two agents, UV irradiation at the presence of Cadmium Oxide (CdO) nanoparticles, the DNA of cancer cells were high eliminated after about 15 (min) of exposure and interestingly the high concentration of Cadmium Oxide (CdO) nanoparticles were enough for this purpose. Cadmium Oxide (CdO) nanoparticles, which produced by laser ablation process, also were able to effectively eliminate the DNA of cancer cells at the presence of UV irradiation in short time that was much less than previous reports [5-24].

According to several researches that were dealt on the effect of irradiation of UV on DNA of cancer cells, we developed a new method for eliminating of DNA of cancer cells by applying both Cadmium Oxide (CdO) nanoparticles and UV irradiation, which involve using a high concentration of Cadmium Oxide (CdO) nanoparticles at the presence of UV irradiation in short time irradiation. Production of Protoporphyrin IX, Methyl Aminolevulinate and Protoporphyrin have been suggested as a probable reason of DNA death by this treatment. An appropriate does of Cadmium Oxide (CdO) nanoparticles led to DNA death through several mechanisms, which include free radical production near it and pits creation in DNA of cancer cells. According to our experiment, applying a higher concentration of Cadmium Oxide (CdO) nanoparticles at the presence of UV irradiation may represent a novel method for eliminating of DNA of cancer cells, particularly in patients who have failed current medical, clinical, biological, pharmaceutical, biochemical and photodynamic treatments.

References

1 Heidari A, Brown C (2015) Study of composition and morphology of cadmium oxide (CdO) nanoparticles for eliminating cancer cells. Journal of Nanomedicine Research 2: 20.

2 Heidari A, Brown C (2015) Study of surface morphological, phytochemical and structural characteristics of rhodium (III) oxide (Rh_2O_3) nanoparticles, International Journal of Pharmacology. Phytochemistry and Ethnomedicine 1: 15-19.

3 Heidari A (2015) Simulation of interaction of light and iridium nanoparticles using 3D finite element method (FEM) as an optothermal cancer cells treatment. International Journal of Theoretical, Computational and Mathematical Chemistry 1: 11-16.

4 Heidari A (2012) A thesis submitted to the faculty of the chemistry, California South University (CSU), Irvine, California, The United States of America (USA) in fulfillment of the requirements for the degree of Doctor of Philosophy (PhD) in Chemistry.

5 Cabral E, Cardoso LC, Pereira IA, Ramos PM, Fernando H, et al. (2016) CdTe quantum dots as fluorescent probes to study transferrin receptors in glioblastoma cells. Biochimica et Biophysica Acta (BBA) - General Subjects 1860: 28-35.

6 Fitzgerald A, Meenakshi M, Matt G, Florence S, James CE, et al. (2016) A novel, anisamide-targeted cyclodextrin nanoformulation for siRNA delivery to prostate cancer cells expressing the sigma-1 receptor. International Journal of Pharmaceutics 499: 131-145.

7 Mohammad AF, Mohammad AA, Shen-Ming C, Ying Li, Mohammad AF, et al. (2016) Silver nanoparticles synthesized from Adenium obesum leaf extract induced DNA damage, apoptosis and autophagy via generation of reactive oxygen species. Colloids and Surfaces B: Biointerfaces 141: 158-169.

8 Hanot-Roy M, Emilie T, Ariane G, Anne B, Pascale V, et al. (2016) Oxidative stress pathways involved in cytotoxicity and genotoxicity of titanium dioxide (TiO2) nanoparticles on cells constitutive of alveolo-capillary barrier in vitro. Toxicology in vitro 33: 125-135.

9 Pratik M, Sambit R, Sayantan S, Bhaskar D, Khan I, et al. (2016) Facile bio-synthesis of gold nanoparticles by using extract of Hibiscus sabdariffa and evaluation of its cytotoxicity against U87 glioblastoma cells under hyperglycemic condition. Biochemical Engineering Journal 105: 264-272.

10 Paulo EF, Pamela CG, Amanda VJ, Antônio CT, Maria C, et al. (2016) Synthesis of ZnPc loaded poly(methyl methacrylate) nanoparticles via mini emulsion polymerization for photodynamic therapy in leukemic cells. Materials Science and Engineering: C 60: 458-466.

11 Dávid K, Krisztina S, Nóra I, Gabriella S, József M, et al. (2016) Silver nanoparticles modulate ABC transporter activity and enhance chemotherapy in multidrug resistant cancer. Nanomedicine: Nanotechnology, Biology and Medicine 12: 601-610.

12 Brittany H, Yanhua Z, Fangchao L, Jing L, Sarah P, et al. (2016) Gold nanoparticle conjugated Rad6 inhibitor induces cell death in triple negative breast cancer cells by inducing mitochondrial dysfunction and PARP-1 hyperactivation: Synthesis and characterization, Nanomedicine: Nanotechnology. Biology and Medicine 12: 745-757.

13 Chidambaram K, Palanivel S, Mahalingam M, Rajamanickam U, Rajarajeswaran J, et al. (2016) Synthesis of flexirubin-mediated silver nanoparticles using Chryseobacterium artocarpi CECT 8497 and investigation of its anticancer activity. Materials Science and Engineering: C 59: 228-234.

14 Abhinav K, Elif MB, Anna BM, Paul EP, Marco M, et al. (2016) Enrichment of immunoregulatory proteins in the biomolecular corona of nanoparticles within human respiratory tract lining fluid. Nanomedicine: Nanotechnology, Biology and Medicine 12: 1033-1043.

15 Lucie A, Mathilde B, Laure B, Véronique C, Hélène D, et al. (2016) Molecular responses of alveolar epithelial A549 cells to chronic exposure to titanium dioxide nanoparticles: A proteomic view. Journal of Proteomics 134: 163-173.

16 Catherine AG, Bastien D, Ravanat JL, Véronique CF, Hélène D, et al. (2016) A combined proteomic and targeted analysis unravels new toxic mechanisms for zinc oxide nanoparticles in macrophages, Journal of Proteomics 134: 174-185.

17 Sunil S, Rahul C, Sangram R, Jaclyn B, Nirupama S, et al. (2016) Photophysical characterization of anticancer drug valrubicin in rHDL nanoparticles and its use as an imaging agent. Journal of Photochemistry and Photobiology B: Biology 155: 60-65.

18 Hongdi W, Jialing F, Guijin L, Baoqiong C, Yanbin J, et al. (2016) In vitro and in vivo anti-tumor efficacy of 10-hydroxycamptothecin polymorphic nanoparticle dispersions: shape- and polymorph-dependent cytotoxicity and delivery of 10-hydroxycamptothecin to cancer cells. Nanomedicine: Nanotechnology, Biology and Medicine 12: 881-891.

19 Jan Z, Marina P, Gerd L, Ralf PF, Gunter A, et al. (2016) Pharmaceutical formulation of HSA hybrid coated iron oxide nanoparticles for magnetic drug targeting. European Journal of Pharmaceutics and Biopharmaceutics 101: 152-162.

20 Deepti C, Lipika R, Ashish D, Shashi KT, Jyoti S, et al. (2016) Photoprotective efficiency of PLGA-curcumin nanoparticles versus curcumin through the involvement of ERK/AKT pathway under ambient UV-R exposure in HaCaT cell line. Biomaterials 84: 25-41.

21 Sandra VP, Xiaoyan L, Isabelle M, Jennifer DS, Yong Q, et al. (2016) Effects of intratracheally instilled laser printer-emitted engineered nanoparticles in a mouse model: A case study of toxicological implications from nanomaterials released during consumer use. NanoImpact 1: 1-8.

22 Anitha J, Kadarkarai M, Chellasamy P, Pari M, Devakumar D, et al. (2016) Earthworm-mediated synthesis of silver nanoparticles: A potent tool against hepatocellular carcinoma, Plasmodium falciparum parasites and malaria mosquitoes. Parasitology International 65: 276-284.

23 Paulo EF, Ana LC, Maria IA, Ana PM, Fernando HM, et al. (2016) CdTe quantum dots as fluorescent probes to study transferrin receptors in glioblastoma cells. Biochimica et Biophysica Acta (BBA) - General Subjects 1860: 28-35.

24 Kathleen A, Meenakshi M, Matt G, Florence S, James CE, et al. (2016) A novel, anisamide-targeted cyclodextrin nanoformulation for siRNA delivery to prostate cancer cells expressing the sigma-1 receptor. International Journal of Pharmaceutics 499: 131-145.