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PART 1:

Journal Name:	International Research Journal of Pure and Applied Chemistry
Manuscript Number:	2012_IRJPAC_2622
Title of the Manuscript:	Comparison of Biophysical and Radiological Responses of Bio-test objects to Pulsed and Continuous X- and Neutron-Irradiations

General guideline for Peer Review process is available in this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)

- This form has total 9 parts. Kindly note that you should use all the parts of this review form.



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PART 2: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	Novelty: A comparison of biological effects of new DPF devices against conventional radiation sources has been presented. Some of the data have been already presented in proceedings: 17th IAEA Technical Meeting on Research Using Small Fusion Devices. Moreover the comparison both physical and radiobiological between pulsed and continuous X- and Neutron-Irradiations is relevant for the state of the art in the field. <i>DPF for NCT(Neutron Capture Therapy):</i> The use of short and powerful neutron pulses for NCT is feasible but the combined effect of intense X Rays pulses of and fast neutrons could produce a severe damage to the earthy tissue. The binary effects of NCT with 10B-carriers should produce a cellular lethal damage in preferentially cancer cell, according their boron loading, and then the selectivity of a suitable boronated bio-molecules for tumor cells. In this sense, the synergic effects of intense X Rays pulses leads by contrary to a damage of healthy tissue. Author must take into account this aspects in the paper while they propose DPF for (B)NCT.	We made proper references to our previous papers and here we have presented verification of our previous results using another bio-test objects and a number of different X-ray and neutron sources – both continuous and pulsed. The dose and dose power ranges used in these experiments are wider than in previous ones. - We invite the reviewer kindly to see our recent paper devoted to a discussion of <i>selectivity</i> of damage of malignant cells where DPF may have some advantages: G. Giannini¹, V. Gribkov, F. Longo, M. Ramos Aruca and C. Tuniz, Opportunities afforded by the intense nanosecond neutron pulses from a plasma focus source for neutron capture therapy and the preliminary simulation results, <i>Phys. Scr.</i> 86 (2012) 055801 (9pp) doi:10.1088/0031-8949/86/05/055801 - In this very paper submitted now a DPF is proposed just as a neutron source instead of the common ones.



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	Authors state: <i>“Some problems are badly studied here. These issues relate to dosage for the intermediate layers of organism while deeply located tumor is under irradiation, to neutron scattering and penetration within organism, combined irradiation modes, etc.”</i> Please refer to literature: this is probably true for very short neutron pulses, while dosimetry with Monte Carlo simulation is nowadays a well established approach in NCT. <i>Radioenzymology: the Authors states “Among fundamental problems of radiation biology a new presently born discipline radioenzymology occupies an important place.”</i> The effects of ionizing radiation on enzymes have been well studies in the past, see the following as an example, as it was published for the first time in 1962: “The Effects of Ionizing Radiation on Enzymes”, AU - Augenstine, L. G., John Wiley & Sons, Inc, UR - http://dx.doi.org/10.1002/9780470124888.ch7,	- Synergism of radiations of different quality depends on the depth distribution of absorbed energy (see however the above paper). - Please, see the above cited paper where we have made MCNP calculations and where we have discussed the problems of short pulses in this modelling. - At the same time to our meaning the MCNP methods do not allow to trace a destiny of the overall spectrum of dose-creating particles. That is why the experiments similar to those presented in the paper are so important. - We agree that enzymes were irradiated almost 50 years ago, and we made corresponding changes in the text with the additional references. - However the term “radioenzymology” was appeared at first in 90-s. It is characterized by methods of investigations: <i>mutual</i> radiochemistry, kinetic, general enzymology and bio-engineering. We have provided a reference to the first publication on it.
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	Definition of “<i>bio-test objects</i>”: while the Authors intend with “phantom studies” or “in vitro studies” as conventionally used in literature? Radiological (i.e. related to imaging) is often used instead of “Radiobiological” or simply “Radiation” . • Materials & Methods (M&M): the section “Apparatus”..“Methodology” should be reorganized and renamed as “Materials & Methods”. The description of the systems used in the experiments as well as the methods should be detailed giving a technical descriptions of the system, or clearly referring to previous publications of the Authors. Please move any comment on the advantages of the techniques in the Discussion section. <i>Methods for radiobiological testing:</i> please do	- Of course, <i>in vitro</i> mainly. - In the 1962 the ATC enzyme was not known yet. - Certainly, everybody would like to obtain results <i>in vivo</i>. However inside the organism the effect under investigation that is a very delicate one cannot be singled out. - However seminal fluid and serum can be counted as <i>ex vitro</i>. - A different situation is with mice. Russian term “radiologic” is broadly used in literature. And it is wider than the English one. The term “Radiation” is an equivalent. We took into account the remark. Done. We used both in radioenzymology and in
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	refers to a well established methodology and literature in the field. Which test have been used and for what? Please give a clear and comprehensive description of each test, starting from the method used for the assay to the number of sample, to the irradiation methods... • Results & Discussion: The use of DPF as radiation source for biomedical application is (for tomographic applications) is out of place in the paper: please eliminate or rephrased, See <i>Line 148-164</i>. Without a clear presentation of the methodology the interpretation of the data is not easy to the reader: please use actual references for discussing the results. The figures 3A,B are not easily understandable: please better clarified in the text. Again, Authors should provide relevant and current references during discussion. Conclusions section is missing. Conclusion must be reported, after a proper discussion inside the manuscript.	the estimations of chromosomal aberrations in human lymphocytes the generally accepted world standards. Now we made all references into previous works where they were described in details, namely: [1, 2, 5, 9-13, 19, and 20]. We agree and we have rephrased the paragraph making the text to be more hypothetical. Methodology is discussed in details in our previous numerous papers. Now we introduced into the text more references: [1, 2, 5, 9-13, 19, and 20]. We agree, and we have reorganized this figure and we have provided for it more explanatory notes. Now it is done. We include this chapter into the manuscript.
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	The references: Authors should provide relevant and current references in the manuscript. The linguistic quality and the overall readability must be improved.	Now we made it. We tried to make our best now.
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments		