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Editorial



This Special issue of Reports in Practical Oncology and Radiotherapy (RPOR) is devoted to the publication of selected papers from the participants in the 7th International Meeting of Young Researchers in Boron Neutron Capture Therapy which took place in Granada, Spain, from 22nd to 26th of September 2013.

I have had the honor and the pleasure of being the meeting organizer, approved by the International Society for Neutron Capture Therapy (ISNCT). When I presented the proposal to the ISNCT in 2011, the great response of all the community filled me with joy. This was an example of the great feelings that I have contrasted in all the ISNCT Congresses that I have attended. There is an interdisciplinary atmosphere of collaboration, communication and mutual encouragement that is not common in other fields of science. I am absolutely grateful to all members of this scientific community.

Boron Neutron Capture Therapy (BNCT) is an experimental radiotherapy technique continuously benefiting from active research throughout the world. It is based on sound physical principles: the cell killing effect is produced by heavy charged ions (alpha particle and a recoil nucleus), the products of a nuclear reaction which happens inside the body by means of a low energy neutron when colliding with an specific nucleus, which in all clinical applications is Boron-10. Then, when the two non-toxic different components of the treatment (neutron field and B-10 tumor-specific compound) meets, a huge amount of energy is delivered locally, leading mostly to cell killing by double strand breaks in DNA.

The results from the clinical trials performed recently in Finland, Italy, Japan, Taiwan and Argentina, among others, are very promising: BNCT is a safe procedure (very small adverse effects), even for patients for which conventional radiotherapy is not possible; an enlargement of the mean survival time is found for very malignant diseases such as Glioblastoma Multiforme; a large percent of recurrent malignant head and neck cancer patients (for which no other treatment was possible) have shown complete tumor remission after a treatment of normally one session, and it is an interesting option for other cancers of very bad prognosis, as large metastasis in liver or malignant melanoma.

In order to become a well-established alternative to other cancer treatments, is it important the progress in some research problems which will optimize treatments, the construction of new facilities and the outreach of this promising therapy.

These latest promising results have motivated that the Nuclear Physics European Collaboration Committee (NuPECC), an Expert Committee of the European Science Foundation has devoted a chapter in the recent report of 2014 "Nuclear Physics for Medicine". BNCT is facing a renovation that may increase its presence in clinical treatments in the forthcoming years: there are different countries developing accelerator-based neutron sources which would replace nuclear reactors for clinical BNCT. These facilities could be built in hospitals and get the procedure closer to the medical community. Also the recent advances from research may lead to a new era in BNCT.

The Young researchers BNCT meeting is a tradition since the first one hold in Petten (Netherlands) in 1999, followed by the jointly hosted in Otaniemi (Finland)-Studsvik (Sweden) in 2001, Pavia (Italy) 2003, Birmingham (UK) in 2007, Mainz (Germany) in 2009 and Taiwan in 2011. These meetings have proved to be very useful forums for students for presenting their ideas, improve their background and collaborate with others. Social events are of special importance during the meeting to contributing to the growth of the scientific community in the field.

During five days, presentations of results from different fields in this interdisciplinary research took place, from engineering and physics to chemistry and pharmacology, and of course, biology and clinical medicine. I hope this exchange of ideas will improve the common knowledge in the field and the rise of new collaborations. In this issue of RPOR some research articles are included: about radiation measurements in BNCT with SPECT, BNCT radiobiology with the latest techniques, a new isotope studied as a collaborative potential neutron capturer, the study of using neutron fields from LINACs for BNCT, imaging techniques for boron microdistribution in cells, and new experimental setups for the irradiation of biological samples. In addition to this, we are proud to include also two reports from senior experts in BNCT, who were invited for the conference: one of them is a report on Microdosimetry and the

other is a report of the present status of the different options for accelerator-based neutron facilities for BNCT.

I would like to thank all the sponsors that have made this meeting affordable to the participants: University of Granada, ACS Foundation, ISNCT, MITRO, Junta de Andalucía (Regional Government) and Ayuntamiento de Granada (Local Government). I also wish to thank sincerely to the Editor-in-Chief of RPOR and all the staff of this journal for giving us the opportunity of presenting our work in this issue. And finally, I wish to thank all participants in the meeting, they who make this an interesting and unique event.

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