

SANTA CRUZ-2: BNCT IN ARGENTINA: AN INTERDISCIPLINARY APPROACH

[POSTER]

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BNCT calls for continuous research and development in different areas which, ideally, should be deeply interconnected. From the technology provided by sophisticated equipment that deliver mixed radiation fields to the intracellular milieu, rather unknown variables play an interrelated role, ultimately leading to the expression of different degrees of the desired therapeutic effect. Sometimes and based on empirical approaches, researchers in BNCT search for more systematic methodologies to understand and improve the outcomes in BNCT. However, the elusive character of the boron compounds, the intricate mammalian physiological mechanisms, the chaotic structure of a solid tumor, the complex aspects of dose delivery in mixed radiation fields or the stochastic nature of radiation, constitute some of the most important sources of uncertainty. Work in each of these areas can be somehow performed separately, but must be analyzed in an INTERDISCIPLINARY context.

The now mature Argentine BNCT project is a modest example of a strongly interactive research program. Twelve subject areas were recognized and formally defined, namely: Accelerators, Clinical Applications, Boron Chemistry, Boron Imaging, Boron Nanovehicles, Computational Dosimetry & Treatment Planning, Medical Physics, Nuclear Instrumentation,

Radiobiology of Colon cancer, Thyroid cancer and Melanoma, Radiobiology of Oral Cancer, Liver and Lung Metastases and Rheumatoid Arthritis, and the RA-3 and RA-6 nuclear reactor teams. However, this does not intend to be an exhaustive classification since many other specialties, groups and international collaborations are also daily involved in the R&D activities.

Soon afterwards it was realized that these areas mould, by far, more working intersections than their original number. Around seventy researchers, technologists, staff and fellows at CNEA, working in three atomic centers and in collaboration with several medical and veterinary institutions are daily gathered around specific projects devoted to posing questions, developing solutions, exploring new applications, providing better answers and establishing new paradigms.

It also became evident that the knowledge and experience gained during years of work in the science and technology of BNCT would be suitable for facing other challenges in particle therapy, i.e., founding the first proton therapy center in Argentina and Latin-America, for medical and basic research.

In this work we will present the status and dynamics of the different projects, and a review of how these diverse R&D areas articulate to produce novel approaches, techniques and ideas for BNCT and beyond.