

<

Part A. PERSONAL DATA		Date	7/02/2022
Name	JOSE IGNACIO PORRAS SANCHEZ		
DNI		Age	
	Open Researcher and Contributor ID, ORCID	0000-0003-0754-8717	
	SCOPUS Author ID	6701825874	
	WoS Researcher ID	B-5574-2017	

A.1. Present professional status

Organism	Universidad de Granada		
Dpt.	Física Atómica, Nuclear y Molecular		
Address	Facultad de Ciencias, Univ. Granada, Granada		
Tel.		e-mail	
Position	Catedrático de Universidad	Fecha inicio	19/04/2016
Keywords (spanish)	Estructura atómica, reacciones nucleares, física médica		
Keywords	Atomic structure, nuclear reactions, medical physics		

A.2. Academic degrees (*título, institución, fecha*)

Degree	University	Year
Doctor en Física	Granada	1992
Licenciado en Ciencias Físicas	Complutense de Madrid	1987

A.3. General indicators of quality of scientific production

Six-year periods of research: 5 (last in 2020),

Directed theses (last 5 years): 3

Publications in Web of Science (last 5 years): 69 (D1: 4)

Total citations (for articles last 5 years): 279 (203 without own citations).

h-index for articles published in the last 5 years: 9

Part B. FREE SUMMARY OF THE CURRICULUM

Main results obtained in the last five years:

- Original proposal of a new isotope (³³S) as an adjuvant of boron for BNCT, reinforced by measurements at CERN of the neutron capture reaction by it; in the development phase of vector compounds of the same.
- Design of an innovative neutron profiler to produce an optimal beam for BNCT from a particle accelerator, improving all previous results. Patent filing and interest of accelerator and hospital construction companies in their operation for prototype installation of an improved BNCT.
- Achieving improvements in treatment planning at BNCT by (i) proposing a new model for biological dose determination in BNCT, obtaining new radiobiological data using precise measurements in a pure neutron line, and (ii) obtaining nuclear data from reactions with minor elements at CERN's n_TOF facility, in the analysis phase.
- Discovery of the possibility of obtaining various emerging radioisotopes of interest in nuclear medicine with the same accelerator used for BNCT, which has motivated the proposal of a novel facility for both applications at the Virgen de las Nieves Hospital in Granada (NEMESIS project).

One of the merits that I consider most relevant is to have formed the first research group in Spain in Boron Neutron Capture Therapy (BNCT), which is currently composed of multidisciplinary researchers from the Departments of Atomic, Molecular and Nuclear Physics and Biochemistry and Molecular Biology III and Immunology of the University of Granada, of the Radiation Oncology, Nuclear Medicine and Radiophysics Services of the Virgen de las Nieves University Hospital with the collaboration of the National Accelerator Center of Seville, the Institute of Materials Science of Barcelona (ICMAB-CSIC), the Laue-Langevin Institute of Grenoble, the University of Pavia-INFN, CERN (we belong to the collaboration of neutrons by time of flight, n_TOF), the University Hospital of Helsinki, the

National Laboratory of Legnaro (Italy) of the INFN, and the University Grenoble-Alpes (Institute of Advanced Biosciences).

The international recognition of my research at BNCT is reflected in the following facts: I was appointed member of the Board of Councillors of the ISNCT in 2014 (www.isnct.net), the first Spaniard in history, and recently unanimously elected President of the society in November 2018 (mandate until 2023). I have given plenary or invited talks on BNCT at the most relevant international conferences, such as the Gordon Research Conference on Neutron Scattering (Hong Kong 2019), the MLZ Neutrons for Health conference (Bad Reichenhall 2017), the Int. Conf. on Nuclear Reaction Mechanisms (Varenna 2018), the 18th International Congress on Neutron Capture Therapy (Taiwan 2018) and I have been a guest expert at the IAEA Consultant Meeting on BNCT (Vienna 2019) and the Technical Meeting of the same agency to develop a Technical Document as a practical guide for future BNCT facilities.

In terms of research management, I have obtained funding from the National and Autonomic Plan, the University of Granada and from foundations and associations as the AECC and the ACS foundation, which together with local associations sponsors the Neutrons University Chair for Medicine that I lead.

Parte C. MORE RELEVANT MERITS MÉRITOS LAST 5 YEARS

C.1. 10 Publications (AC: CORRESPONDING AUTHOR)

P. Torres-Sánchez, I. Porras (AC), N. Ramos-Chernenko, F. Arias de Saavedra & J. Praena (2/5)

Optimized beam shaping assembly for a 2.1-MeV proton-accelerator-based neutron source for boron neutron capture therapy.

Scientific Reports **11**, 7576 (12 pags) **2021**. <https://doi.org/10.1038/s41598-021-87305-9>

Torres-Sanchez P (AC), Porras, I, de Saavedra FA. Praena, J (2/4)

Study of the upper energy limit of useful epithermal neutrons for Boron Neutron Capture Therapy in different tissues

Radiation Physics & Chemistry **185**:109490, **2021**.
<https://doi.org/10.1016/j.radphyschem.2021.109490>

Bortolussi S, Liu, YH, Porras I (AC) (3/3)

Boron Neutron Capture Therapy: From Nuclear Physics to Biomedicine

Biology **10**: 370, **2021**. <https://doi.org/10.3390/biology10050370>

I. Porras (AC), J. Praena, F. Arias de Saavedra, ... & M.J. Ruiz-Magaña (1/13)

BNCT research activities at the Granada group and the project NeMeSis: Neutrons for Medicine and Sciences, towards an accelerator-based facility for new BNCT therapies, medical isotope production and other scientific neutron applications.

Applied Radiation and Isotopes **163**, 109247 (7 pag.), **2020**.
<https://doi.org/10.1016/j.apradiso.2020.109247>

M. Pedrosa-Rivera, J. Praena, I. Porras (AC), ... & M.J. Ruiz-Magaña (3/14)

Thermal Neutron Relative Biological Effectiveness Factors for Boron Neutron Capture Therapy from In Vitro Irradiations

Cells, **9**, 2144 (14 pag.), **2020**. <https://doi.org/10.3390/cells9102144>

C. Guerrero (AC), J. Lerendegui-Marco, M. Paul, ... & P. Žugec (117/153)

Neutron Capture on the s-Process Branching Point ^{171}Tm via Time-of-Flight and Activation

Physical Review Letters **125**, 142701 (8 pag.), **2020**.
<https://doi.org/10.1103/PhysRevLett.125.142701>

M. Pedrosa-Rivera, J. Praena, I. Porras (AC), M.J. Ruiz-Magaña & C. Ruiz-Ruiz (3/5)

A simple approximation for the evaluation of the photon iso-effective dose in Boron Neutron Capture Therapy based on dose-independent weighting factors.

Applied Radiation and Isotopes **157**, 109018 (7 pag.), **2020**.
<https://doi.org/10.1016/j.apradiso.2019.109018>

P. Torres-Sánchez, I. Porras (AC), F. Arias de Saavedra, M.P. Sabariego & J. Praena (2/5)

On the upper limit for the energy of epithermal neutrons for Boron Neutron Capture Therapy.
Radiation Physics and Chemistry **156**: 240-244, **2019**.
<https://doi.org/10.1016/j.radphyschem.2018.11.015>

F. Arias De Saavedra (AC), I. Porras & J. Praena (2/3)

Routes for the production of isotopes for PET with high intensity deuteron accelerators.
Nuclear Instruments and Methods in Physics Research Section A, **887**: 50-53, **2018**.
<https://doi.org/10.1016/j.nima.2018.01.048>

M. Barbagallo (AC), A. Musumarra, L. Cosentino, ... & P. Žugec (98/135)

$^7\text{Be}(n,\alpha)^4\text{He}$ Reaction and the Cosmological Lithium Problem: Measurement of the Cross Section in a Wide Energy Range at n_TOF at CERN.
Physical Review Letters **117**: 152701 (7 pag.), **2016**
<https://doi.org/10.1103/PhysRevLett.117.152701>

C.2. Research Grants (as IP or co-IP)

1) Neuthera: An accelerator-based neutron source for cancer therapy and radioisotope production for diagnosis, CC21-10047

CaixaImpulse Consolidate 2021, La Caixa Foundation

January 2022- December 2023

Amount: 100000 €

PI: Ignacio Porras

1) Aplicaciones complementarias de la instalacion IFMIF-DONES en medicina nuclear y radioterapia (PID2020-117969RB-I00)

Ministerio de Ciencia e Innovación. Programa Estatal de I+D+i Orientada a los Retos de la Sociedad.

2021-2025.

Amount: 72.600,00 €.

PIs: Javier Praena & Ignacio Porras.

2) Estudio y diseño de nuevos tratamientos de radioterapia selectiva del cancer mediante captura de neutrones por boro basada en acelerador electrostatico de baja energia

Fundacion Científica de la Asociación Española Contra el Cáncer (AECC), Convocatoria 2016.

Oct 2016-Mar 2020.

Amount:143.000 €

PI: Ignacio Porras

3) Convenio entre la fundacion ACS y la UGR para el patrocinio de la investigacion en terapia del cancer mediante captura de neutrones por boro.

Fundación ACS

2018-2022.

Amount: 20.000 €/año

PI: Ignacio Porras

5) Simulaciones por ordenador de sistemas cuánticos (FIS2015-69941-C2-1-P)

Ministerio de Economía y Competitividad, Convocatoria proyectos I+D 2015.

Jan 2016-Jun 2019

Amount:: 41.503 €

PIs: Fernando Arias de Saavedra & Ignacio Porras

6) Innovación en la radioterapia dirigida del cáncer mediante técnicas de captura de neutrones de baja energía y otras estrategias basadas en nanoestructuras (P11-FQM-08229)

Consejería de Economía, Innovación y Ciencia de la Junta de Andalucía, Convocatoria 2011 de Proyectos de Excelencia.

Mar 2013-Mar 2017

Amount:: 275.632,00 €

PI: Ignacio Porras

First project in BNCT in Spain.

C.3. Contracts

Contrato: **Convenio Marco de Colaboración para la Certificación De Proyectos I+D+I**

Empresa: *EQA Certificaciones*

Dotación: 36880,80 €. Duración: 2012-2018.

Investigador Responsable: Jesús Banqueri Ozáez

C.4. Patents

Dispositivo de producción, moderación y conformación de haces de neutrones para terapia por captura neutrónica.

Ignacio Porras Sánchez, Javier Praena Rodríguez, Pablo Torres Sánchez, Fernando Arias de Saavedra Alías, Nataliya Ramos Chernenko

Nº: P202030854 Date: 9/8/2020 Holder: Universidad de Granada.

In phase of internacionalization by PCT

C.5. Invited Editor of international journals

- Guest editor of Special Issue of Biology journal (JCR Q1 en Biology, IF: 5.079), 2020:

https://www.mdpi.com/journal/biology/special_issues/BNCT

- Guest editor of Special Issue of Reports of Practical Oncology & Radiotherapy, 2016:

www.sciencedirect.com/journal/reports-of-practical-oncology-and-radiotherapy/vol/21/issue/2

C.6. Member of international committees

- President (2018-2023) of the *International Society for Neutron Capture Therapy* (ISNCT)

- Team Leader/Deputy Team Leader of UGR in the *n_TOF Collaboration* at CERN (2016-today)

C.7. Research stays

- Laboratori Nazionale di Legnaro, INFN (Italia) Sep 2018-Jan 2019. Project NEPIR & SPARE (radiation protection for space missions).

- CERN, Switzerland, Sep 2014-Jan 2015. Corresponding Associate at the Neutron Time of Flight facility.

C.8. Academic posts

- Director of Departamento de Física Atómica, Molecular y Nuclear, from 10/02/2009 to 23/02/2017.

- Director of the Cátedra Universitaria Neutrones para Medicina, from 8/5/2018 up to 2023.