MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

CV date	01/03/2022

Part A. PERSONAL INFORMATION

First name	Antonio		
Family name	Leal Plaza		
Gender (*)		Birth date	
ID number			
e-mail	alplaza@us.es	https://investigacion.us.es/sisius/sis_showpub.php?idpers=4328	
Open Researcher and Contributor ID (ORCID)		0000-0002-0687-5305	

A.1. Current position

Position	Professor		
Initial date	14/05/2008		
Institution	University of Seville		
Department/Center	Fisiología Médica y Biofísica	https://medicina.us.es/es/	
Country	Spain	Teleph. number	954559864
Key words	Medical Physics; UNESCO code: 2406.06; 3201.12		

A.2. Previous positions (research activity interuptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
2004-2005	Postdoctoral researcher/Fox Chase Cancer Center of Philadelphia, USA
1999-2002	Predoctoral researcher/Centro Informático Científico de Andalucía (CICA)

A.3. Education

Pre-Bologne degrees	University	Date
Licenciado en Ciencias Físicas	Universidad de Sevilla	1997
Doctorado en Ciencias Físicas	Universidad de Sevilla	2001

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

I graduated in Physical Sciences with the specialty of Fundamental Physics in 1997, and obtained my Ph.D. degree in 2001, at the University of Seville. My thesis project was developed in the Medical Physics field, managing to simulate actual Intensity Modulated clinical treatments, and since then, I have devoted my research to ionizing radiation for cancer therapy. In my pre-doctoral stage, I obtained a research grant from the Andalusian Computer Science Center (CICA), under public call by the Junta de Andalucía. From 2002 to 2004 I was a post-doctoral researcher funded by the SIEMENS company, Medical Solutions, for the study of new collimation systems in latest generation clinical accelerator models. I obtained the accreditation of Doctor Assistant by ANECA, becoming part of the teaching staff of the Department of Medical Physiology and Biophysics of the University of Seville. During the years 2004 and 2005, I worked as a Visiting Scientist at the Fox Chase Cancer Center in Philadelphia, USA, where I started my research on electron beam modulation for the therapy of shallow tumors, extending its application to the treatment of breast cancer. After that, I obtained the accreditation of Contratado Doctor and, in 2008, I obtained the qualification of University Professor, achieving a permanent position in the Department of Medical Physiology and Biophysics, from where I teach in the Degrees of Medicine and Biomedicine, as well as in Master's degrees, combining this function with the management of research projects and supervision of PhD students.

I am a co-author of more than 50 publications in web of science from which with an average of 35 references cited annually. I have been Principal Investigator in 6 national MINECO and FIS projects, and 3 regional ones, as well as in contracts for MINECO projects such as INTERCONECTA or INNPACTO. I have been the director of 5 doctoral theses and the co-director of another 3. I am a regular collaborator in international work groups, and I usually work as Associated Editor and Referee of scientific papers for impact journals in the area, as well as I collaborate in the evaluation and assessment of research projects, national and international, under public calls. Currently, I lead an interdisciplinary research group composed of clinical specialists and researchers (PADI: CTS-233 "Medical Physics") and I also lead the group attached to CS11 to the Institute of Biomedical Research of Seville (IBiS) with

the title "Special radiotherapy techniques and guided by image". On the other hand, I have accreditation up to Function D for Animal Experimentation. As a tenured professor, I also have a teaching task of Medical Physics and Medical Imaging matters in the degrees of Medicine, Biomedicine and Health Engineering, as well as in postgraduate masters, being coordinator of some of them. I am a regular tutor of final master's projects and I coordinate a line of research registered in the Doctoral Program of Molecular Biology, Biomedicine and Clinical Research of the University of Seville, where I am a member of the Academic Commission of the Master of Biomedical Research.
I have achieved the official recognition of 4 six-year term of research and 1 of knowledge transfer and innovation by the ANECA (National Commission for the Evaluation of Research Activity).

Part C. RELEVANT MERITS

C.1. Publications (more relevant publications from 10 years ago)

- Skwierawska, D.; López-Valverde, J.A.; Balcerzyk, M.; **Leal, A**. Clinical Viability of Boron Neutron Capture Therapy for Personalized Radiation Treatment. *Cancers* 2022, *14*, 2865. https://doi.org/10.3390/cancers14122865 2022 Impact:Q1
- López-Valverde JA, Jiménez-Ortega E, Leal A. Clinical Feasibility Study of Gold Nanoparticles as Theragnostic Agents for Precision Radiotherapy. *Biomedicines.* 10(5):1214. https://doi.org/10.3390/biomedicine. 2022 Impact: Q1
- Miras, H.; Terrón, J.A.; Bertolet, A.; **Leal, A.** Modified Geometry of 106Ru Asymmetric Eye Plaques to Improve Dosimetric Calculations in Ophthalmic Brachytherapy. *J. Pers. Med. 12*, 723. https://doi.org/10.3390/jpm12050723. 2022 Impact: Q1
- Stefano, Alessandro; **Leal, Antonio**; Richiusa, Selene; Trang, Phan; et al. Robustness of PET radiomics features: Impact of co-registration with MRI. *Applied Sciences* 11(21):10170. https://doi.org/10.3390/app112110170. 2021 Impact: Q2
- Elisa Jiménez-Ortega, Ana Ureba, José Antonio Baeza, Ana Rita Barbeiro, Marcin Balcerzyk, Ángel Parrado-Gallego, Amadeo Wals-Zurita, Francisco Javier García-Gómez, **Antonio Leal**. Accurate, Robust and Harmonized Implementation of Morpho-functional Imaging in Treatment Planning for Personalized Radiotherapy. *PLoS ONE* 14(1): e0210549. https://doi.org/10.1371/journal.pone.0210549. 2019. Impact: Q2
- Carlos Míguez, Elisa Jiménez-Ortega, Bianey A. Palma, Hector Miras, Ana Ureba, Rafael Arráns, Francisco Carrasco-Peña, Ana Illescas-Vacas, **Antonio Leal**. Clinical implementation of combined modulated electron and photon beams with conventional MLC for accelerated partial breast irradiation. *Radiotherapy and Oncology.* 124(1):124-129. 2017. Impact: Q1
- Jiménez-Ortega E, Ureba A, Vargas A, Baeza JA, Wals-Zurita A, García-Gómez FJ, Barbeiro AR, **Leal A**. Dose painting by means of Monte Carlo treatment planning at the voxel level. *Phys Med.* 42:339-344. 2017. Impact: Q2
- Balcerzyk, Marcin, Fernández López, Rosa, Parrado a, Pachón Garrudo, Víctor Manuel, Chavero Royán, José, **Leal A**. Application of EARL (ResEARch 4 Life®) protocols for [18F]FDG-PET/CT clinical and research studies. A roadmap towards exact recovery coefficient. *Nucl. Instrum. Meth. A.* 873,21: 39-42. 2017. Impact: Q2
- Barbeiro, Ana Rita; Ureba, Ana; Baeza, José Antonio; Linares, Rafael; Perucha, Maria; Ortega, Elisa; **Leal, Antonio**. A QA system based on MC simulation of log files refined from rolled films for 3D verification and evaluation of VMAT. *PLoS ONE* 11(11): e0166767. https://doi.org/10.1371/journal.pone.0166767. 2016. Impact: Q1
- Ureba A, Salguero FJ, Barbeiro AR, Jimenez-Ortega E, Baeza JA, Miras H, Linares R, Perucha M, **Leal A**. MCTP system model based on linear programming optimization of apertures obtained from sequencing patient image data maps. *Med Phys.* 41 (8). 2014. Impact: Q2
- Zarza-Moreno, M., Carreira, P., Madureira, L., Miras del Rio, H., Salguero, F. J., **Leal, A.**, Teixeira, N., Jesus, A. P., Mora, G. Dosimetric effect by shallow air cavities in high energy electron beams. *Phys Med.* 30(2):234-41. https://doi: 10.1016/j.ejmp.2013.07.125. 2014. Impact: Q2
- Simoes, Hugo; Pinto, Marco; Cunha, Micaela; Goncalves, Joana; Sampaio, Liliana; Ferreira, Ricardo J.; Saraiva, Henrique M.; Barbeiro, Ana Rita; Capela, Miguel; Ferreira, Brigida; Fonte, Paulo; Ghithan, Sharif; **Leal Plaza, Antonio**; Lopes, Maria do Carmo; Martins, Paulo; Crespo, Paulo. Dose-free monitoring of radiotherapy treatments with scattered photons: First experimental results at a 6-MV Linac. *IEEE Trans. Nucl. Sci.*. 60(4):3110-3118, 2013. Impact: Q1
- Bianey Atriana Palma, Ana Ureba Sánchez, Francisco Javier Salguero, Rafael Arráns, Carlos Míguez Sánchez, Amadeo Walls Zurita, María Isabel Romero Hermida, **Antonio Leal**. Combined modulated electron and photon beams planned by a Monte-Carlo-based optimization procedure for

accelerated partial breast irradiation. *Physics in Medicine & Biology*. 57(5):1191-202. 2012. Impact: Q1

C.2. Congress (only international oral communication as speaker)

- JA. López-Valverde, I. Chavarría, E Jiménez-Ortega, R. Arráns, S. Velazquez, A Leal. Gold nanoparticles and SBRT synergy on whole breast tumor treatment planning. Congress: The 3rd European Congress of Medical Physics, organized by EFOMP. Torino, Italy, 2021.
- Leal A, Jiménez-Ortega E, Ureba A, Baeza JA, Barbeiro AR. A Monte Carlo model for planning radiotherapy based on the morpho-functional image towards the theragnosis. Workshop: Radiotherapy Modelling. Luz Saint Sauveur (Francia), 2016.
- Leal Plaza, Antonio. Optimization: IMRT and VMAT. IUPESM World Congress (WC) on Medical Physics (MP) and Biomedical Engineering (BME). Toronto , Canada. 2015
- Leal Plaza, Antonio. Radiation Treatment Planning Systems and Dose Computation Algorithms (including Monte Carlo). IUPESM World Congress (WC) on Medical Physics (MP) and Biomedical Engineering (BME). Toronto , Canada. 2015
- Leal A, Salguero, FJ, Arrans, R, Palma, B, Ureba, Romero, I. Radiotherapy optimization methods for modulated beams in Monte Carlo treatment planning. Workshop Radiotherapy and Mathematics, Universidade Santiago de Compostela, 2010.
- A.Leal, C. Ma, F. du Plessis, JI. Lagares, J.Li et al.: Energy and intensity modulated radiation therapy using a Monte Carlo optimization procedure. AAPM 47th Annual Meeting. Seattle, USA 2005. Medical Physics 32(6): 2070-2070
- A.Leal, C. Ma, F. du Plessis, JI. Lagares, J.Li et al.: Energy and intensity modulated electron radiation therapy by means a Monte Carlo routine. 8th Biennial ESTRO Meeting. Lisbon, Portugal 2005. Radiotherapy and Oncology S94-S94, Suppl. 2.
- A.Leal, F. Sánchez-Doblado, M. Perucha, M. Rincón, R. Arráns, C. Bernal, E. Carrasco. Monte Carlo simulation of an arc-therapy treatment by means of a PC distribution model. MC 2000. Book of proceedings. Lisbon, Portugal, 2000.
- A.Leal, F. Sánchez-Doblado, M. Rincón, M. Perucha, R. Arráns, C. Bernal, E. Carrasco.PC-based process distribution to solve iterative Monte Carlo simulations in physical dosimetry. MC 2000. Book of proceedings. Lisbon, Portugal, 2000.

C.3. Research projects (only as Principal Investigator)

- Project title: Experimental evaluation of the theragnostic possibilities of gold nanoplatforms in Radiotherapy.
  Funding entity: Consejería de Economía, Conocimiento, Empresas y Universidad. PAIDI 2020: Proyectos I+D+i
  Date, from: 05/10/2021 to:31/12/2022 Budget: 109.900 €
- Project title:Aproximación a la radioterapia personalizada a traves del uso de nanopartículas como agente teragnóstico en tratamientos hipofraccionados bajo condiciones de estrés oxidativo.
  Funding entity: Ministerio de Ciencia, Innovación y Universidades
  Date, from: 2019 to: 2021 Budget: € 114.950,00
- Project title:Sistema 4uArC de verificación y control de calidad 4D para el tratamiento radioterápico extracraneal estereotáxico (SBRT) específico del paciente con lesión sometida a movimiento respiratorio.
  Funding entity: Junta de Andalucía. Trasferencia PAIDI.
  Date, from: 2019 to: 2020 Budget: € 65.194,80
- Project title:Integración de la imagen PET/CT en una planificación radioterápica de precisión y adaptativa.
  Funding entity: Junta de Andalucía
  Date, from: 2014 to: 2017 Budget: € 130.244,00
- Project title:Evaluación clínica y desarrollo de un modelo de optimización para la aplicación de la técnica radioterápica VMAT
  Funding entity: Ministerio de Ciencia e Innovación. OPN - INNPACTO
  Date, from: 2011 to: 2014 Budget: € 168.598,00
- Project title:Desarrollo teórico y evaluación clínica de la técnica radioterápica con arcoterapia volumétrica modulada (VMAT).
  Funding entity: Ministerio de Investigación y Ciencia

Date, from: 2012 to: 2014 Budget: € 128.000

- Project title:Radioterapia con haces de electrones modulados en combinación con IMRT para el tratamiento de cáncer de mama y cabeza-cuello
  Funding entity: Junta de Andalucía
  Date, from: 2009 to: 2013 Budget: € 76.026,50
- Project title:Radioterapia con haces de electrones modulados en combinación con IMRT: Planificación basada en Monte Carlo.
  Funding entity: Ministerio de Investigación y Ciencia
  Date, from: 2009 to: 2011 Budget: € 115.000,00
- Project title:Modulación de la intensidad y la energía de haces de electrones para tratamientos radioterápicos de cáncer de cabeza-cuello y mama.
  Funding entity: Fondo de Investigaciones Sanitarias (FIS). Instituto de Salud Carlos III, Ministerio de Sanidad y Consumo
  Date, from: 2005 to: 2007 Budget: € 141,565.00

C.4. Contracts, technological or transfer merits

- Project title: Desafío integral frente al cáncer de mama
  Funding entity: Proyecto CDTI (Exploraciones Radiológicas Especiales SA (ERESA)
  Entity where project took place: Fundación Universidad de Sevilla (FIUS), ERESA
  Date, from: 2012 to: 2015
  Budget: 108.447,92 €
- Project title: Desarrollo de un Gantry superconductor para el tratamiento de tumores con técnicas de protonterapia.
  Funding entity: Proyecto CDTI (TTI. NORTE S.L.)
  Entity where project took place: Fundación Universidad de Sevilla (FIUS), TTI. NORTE S.L.
  Date, from: 2014 to: 2015
  Budget: 22.800,00 €
- Project title: Sistema de fusión de imágenes PET y Resonancia Magnética para el diagnóstico médico
  Funding entity: Consejería de Investigación y Ciencia
  Entity where project took place: Orienta Ingeniería - Universidad de Sevilla
  Date, from: 2006 to: 2007
  Budget: € 30.360,00
- Project title: Estudio de la influencia de la anchura de las hojas del colimador multilámina en la probabilidad de control tumoral
  Funding entity: SIEMENS, Medical Solutions
  Entity where project took place: Servicio Andaluz de Salud (SAS), Universidad de Sevilla, SIEMENS
  Date, from: 2001 to: 2003
  Budget: € 40.000,00

Transfer merits

- Recognition of the one six-year term of knowledge transfer and innovation by the ANECA (National Commission for the Evaluation of Research Activity).
- Professional protocol. F. Sánchez-Doblado, R. Arráns, A. Leal, J. V. Roselló, E. Carrasco
  Título: New trends in Radiotherapy: Intensity Modulated
  ISBN: 84-95454-599, 2001.
- Professional protocol. F. Sánchez-Doblado, R. Arráns, A. Leal, J. V. Roselló, E. Carrasco
  Título: Verification of IMRT.
  ISBN: 84-95454-580, 2001.
- Pending patent application No. P202131036 " Método para la planificación de tratamiento de radioterapia"
- Pending patent application No. P202131034 “Equipo médico de verificación y control de calidad radioterápica 4D”