MINISTERIO DE CIENCIA E INNOVACIÓN

CURRICULUM VITAE (maximum 4 pages)

AGENCIA ESTATAL DE INVESTIGACIÓN

Part A. PERSONAL INFORMATION

First and Family name	Alejandro Yánez Santana		
Social Security, Passport, ID number		Age	
Researcher codes	WoS Researcher ID *(*)*		
	SCOPUS Author ID*(*)*	56423836100	
	Open Researcher and Contributor ID (ORCID) **	0000-0002-1736-552X	

(*) At least one of these is mandatory
(**) Mandatory

A.1. Current position

Name of University/Institution	University of Las Palmas de Gran Canaria		
Department	Mechanical Engineering		
Address and Country	Edificio de Ingenierías. Las Palmas de Gran Canaria. Spain		
Phone number	+34 928451897	E-mail	alejandro.yanez@ulpgc.es
Current position	Profesor Titular de Universidad	From	20/03/2011
Key words	Machine design. Biomechanics		

A.2. Education

PhD	University	Year
Ingeniero Técnico Industrial	University of Las Palmas de Gran Canaria	1993
Ingeniero Industrial (Mecánica)	University of Las Palmas de Gran Canaria	2005
PhD	University of Las Palmas de Gran Canaria	2009

A.3. JCR articles, h Index, thesis supervised…

- sexenios de investigación (last granted 2018)
- Supervised PhD theses: 1. Currently supervising: 4
- Total references: 622
- Average references/year during the last 5 years: 68
- h index: 9.
- 22 JCR papers
- 7 Q1 JCR papers
- 12 Q1 SJR papers

Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

Alejandro Yánez Santana is a Mechanical Industrial Engineer and holds a PhD by the University of Las Palmas de Gran Canaria (ULPGC). He is a Senior Lecturer in the Mechanical Engineering Department (DIM), in the Mechanical Engineering area of the ULPGC. He has 8 trienios and 5 quinquenios at the teaching level and 2 research sexenios. He has served as Chief of Services at the DIM and Assistant Director at the School of Industrial and Civil Engineering. He is currently the Head of the DIM and the Head of the Biomaterials and Biomechanics Research Group of the ULPGC.

His research field has focused on Biomechanics and Biomaterials, especially in the biomechanics of the bone and scaffolds and medical applications of porous titanium structures fabricated by additive manufacturing. In 2005 he started the PhD program of Biomechanics, with mention of quality, at the University of Zaragoza and the Polytechnic University of Catalonia. He finished his PhD at the ULPGC with the reading of the thesis “Diseño y análisis teórico-experimental de un nuevo sistema de sujeción de tornillos de osteosíntesis en huesos osteoporóticos cilíndricos largos" in April 2009. Derived from the thesis, a utility model and a national and an international patent were obtained. These patents are being used by SURGIVAL S.L. and TRAUMAQUIR S.L. companies. As well, a total of 7 JCR papers have been obtained from the theses. In 2010, he began a close collaboration with the biomedical engineering division of the Technological Institute of the Canary Islands. From this collaboration there are several projects and publications related to the design and

improvement of titanium scaffolds obtained by additive manufacturing, as well as optimization of custom-made orthopaedic implants manufactured with this technology. That collaboration remains until today.

He has participated in 13 R&D projects financed in national and international public calls; two of them National Plan as IP (main researcher). He is the author of 3 utility models and 1 international patent in use. He has published 17 JCR research articles with an h index 8. He has presented more than 40 articles in national and international conferences. He has supervised 1 PhD thesis and currently he supervises 4. He has had mobility research placements at the University College of London (UK), Xi´an Jiatong University (China) and École de Technologie Supérieure de Montreal (Canada). He has participated in the organization of 3 conferences, one international and two national. He is reviewer of research projects and research articles. He is a member of the Spanish Association of Mechanical Engineering and the president of the Executive Board of the Spanish Chapter of the European Society of Biomechanics.

Part C. RELEVANT MERITS

C.1. Publications (including books)

- Fiorucci MP, Cuadrado A, Yánez A, Martel O, Mentado B, Monopoli D. Biomechanical characterization of custom-made dynamic implants fabricated by Electron Beam Melting for anterior chest wall reconstruction. Mater Des 2021;206. https://doi.org/10.1016/j.matdes.2021.109758.

- Yánez A, Paula Fiorucci M, Cuadrado A, Martel O, Monopoli D. Surface roughness effects on the fatigue behaviour of gyroid cellular structures obtained by additive manufacturing. Int J Fatigue 2020;138:105702. https://doi.org/10.1016/j.ijfatigue.2020.105702.

- D. Pérez, O. Martel, A. Yánez, J.R. Cano, A. Cuadrado, G. Torrent, L. López, Does the modelling of the pectus bar affect its stability? Rationale for using a short flat bar, Interact. Cardiovasc. Thorac. Surg. (2019) 1–7. doi:10.1093/icvts/ivz217.

- G.L. Garcés, O. Martel, A. Yánez, A. Cuadrado. Does thread shape affect the fixation strength of the bioabsorbable interference screws for anterior cruciate ligament reconstructions? A biomechanical study, BMC Musculoskelet. Disord. 20 (2019) 4–11.

- A. Pérez-Sánchez, A. Yánez, A. Cuadrado, O. Martel, N. Nuño, Fatigue behaviour and equivalent diameter of single Ti-6Al-4V struts fabricated by Electron Bean Melting orientated to porous lattice structures, Mater. Des. 155 (2018) 106–115.

- A. Yánez, A. Cuadrado, O. Martel, H. Afonso, D. Monopoli, Gyroid porous titanium structures: A versatile solution to be used as scaffolds in bone defect reconstruction, Mater. Des. 140 (2018) 21–29.

- A. Cuadrado, A. Yánez, O. Martel, S. Deviaene, D. Monopoli, Influence of load orientation and of types of loads on the mechanical properties of porous Ti6Al4V biomaterials, Mater Des. 135 (2017) 309-318.

- Yánez, A., Herrera, A., Martel, O., Monopoli, D., Afonso, H. 2016, “Compressive behaviour of gyroid lattice structures for human cancellous bone implant applications”, Materials Science and Engineering: C, vol. 68, no. 1, pp. 445-448.

- Herrera, A., Yánez, A., Martel, O., Afonso, H. & Monopoli, D. 2014, "Computational study and experimental validation of porous structures fabricated by electron beam melting: A challenge to avoid stress shielding", Materials Science and Engineering: C, vol. 45, no. 0, pp. 89-93.

- Yánez, A., Cuadrado, A., Cabrera, P.J., Martel, O. & Garcés, G. 2014, "Experimental analysis of the minimally invasive plate osteosynthesis technique applied with non-locking screws and screw locking elements", Medical Engineering and Physics.

- Garces, G., Rodriguez, O., Grau-Bassas, E., Roiz, s., Yanez, A., Cuadrado, A. 2014 “Use of screw locking elements improves radiological and biomechanical results of femoral osteotomies”, BMC MUSCULOSKELETAL DISORDERS. 15, pp. 387 - 387.

- Cuadrado, A., Yánez, A., Carta, J.A. & Garcés, G. 2012, "Suitability of DCPs with Screw Locking Elements to allow sufficient interfragmentary motion to promote secondary bone healing of osteoporotic fractures", Medical Engineering and Physics.

- Yánez, A., Cuadrado, A., Carta, J.A. & Garcés, G. 2012, "Screw locking elements: A means to modify the flexibility of osteoporotic fracture fixation with DCPs without compromising system strength or stability", Medical Engineering and Physics, vol. 34, no. 6, pp. 717-724.

- Yánez, A., Garcés, G.L., Carta, J.A. & Cuadrado, A. 2011, "A new system to improve screw fixation to bones", Journal of Medical Devices, Transactions of the ASME, vol. 5, no. 4.

- Yánez, A., Carta, J.A. & Garcés, G. 2010, "Biomechanical evaluation of a new system to improve screw fixation in osteoporotic bones", Medical Engineering and Physics, vol. 32, no. 5, pp. 532-541.

C.2. Research projects

- (PID2020-116336RB-I00) Analisis biomecanico y biologico de la combinacion de sistema de osteosintesis y scaffold para la reparacion de defectos oseos segmentarios., Ministerio de Ciencia e Innovación de España. IP: Alejandro Yánez Santana. Universidad de Las Palmas de Gran Canaria. Desde 01/09/2021 a 31/18/24. Cuantía de la subvención: 105.000 €. Investigador principal.

- (H2020-MSCA-RISE-2016-734156) Biomaterials and Additive Manufacturing Osteochondral Scaffold innovation applied to osteoarthritis (BAMOS). Horizon 2020, European Union funding for Research & Innovation. IP: Mario Monzón Verona. Universidad de Las Palmas de Gran Canaria. From 01/01/2017- to 1/12/2020. Amount: 225.000 €. Member of the Research Group.

- (DPI2015-71073-R) Mejora de la osteointegración de estructuras porosas de titanio mediante la optimización del diseño y modificación superficial con recubrimiento polimérico (SUPPORT). Ministerio de Economía y Competitividad, Programa Estatal de Investigación, Desarrollo e Innovación Orientada a los Retos de la Sociedad. IP: Alejandro Yánez Santana. Universidad de Las Palmas de Gran Canaria. Desde 01/01/2016 a 31/12/2018. Cuantía de la subvención: 238.000,98 €. Investigador principal.

- (SAF2010-20042) Uso de tornillos bloqueados con tuercas de PEEK para acelerar la consolidación de las fracturas. Ministerio de Ciencia y Tecnología. IP: Gerardo Garcés Martín. Universidad de Las Palmas de Gran Canaria. Desde 01/01/2011 a 01/01/2013. Cuantía de la subvención: 70000 €. Miembro del equipo investigador.

- (UNI2010/25) Optimización del diseño de estructuras metálicas porosas para aplicaciones médicas. Universidad de Las Palmas de Gran Canaria. IP: Alejandro Yánez Santana. Desde 07-06-2011 a 31-12-2011. Cuantía de la subvención: 3000 €. Investigador principal.

C.3. Contracts, technological or transfer merits

- Desarrollo y validación de una arandela de retención para hueso osteoporótico. Gobierno de Canarias, Programa de Apoyo a la Innovación de las Pequeñas y Medianas "Innoempresa. 2009". LPA. 0200. Entidades participantes: Universidad de Las Palmas de GC y empresa ACJ SL. IP: Gerardo Garcés Martín. Desde enero 2005 a diciembre 2005. Cuantía de la subvención: 25066,00 €. Miembro del equipo.

- Prototipo de herramienta y aparataje de implantación de tuercas de bloqueo SLE en clavículas. Gobierno de Canarias y la Unión Europea, Programa de Apoyo a la Innovación de las Pequeñas y Medianas Empresas InnoEmpresa 2013. Entidades participantes: Universidad de Las Palmas de GC y empresa ACJ SL. IP: Gerardo Garcés Martín. Desde enero 2013 a diciembre 2013. Miembro del equipo

C.4. Patents

- Instrumento para la fijación de tornillos en huesos osteoporóticos. Inventores (p.o. de firma): Gerardo Garcés Martín, José Antonio Carta González y Alejandro Yánez Santana. N. de publicación: ES 2327374 B1. N. de solicitud: ES 200702391. País de prioridad: España. Fecha de presentación: 04/09/2007. Fecha de concesión: 22/07/2010. Entidad titular: VEME Médico Quirúrgica S.L. Empresa/s que la están explotando: Surgival S.A.U. y Traumaquir S.L.

- Sistema de fijación de tornillos para huesos osteoporóticos. Inventores (p.o. de firma): Gerardo Garcés Martín, José Antonio Carta González y Alejandro Yánez Santana. N. de solicitud: PCT/ES2008/000574. País de prioridad: USA. Fecha de solicitud: 03/09/2008. Entidad titular: VEME Médico Quirúrgica S.L. Países a los que se ha extendido: Europa, Brasil y Méjico. Empresa/s que la están explotando: Surgival S.A.U. y Traumaquir S.L.

C.5. Institutional responsibilities

- Head of the Biomaterials and Biomechanics Research Group of the ULPGC. From 2019 to the present.
- Head of the Department of Mechanical Engineering of the ULPGC. From 2017 to the present.

C.6. Memberships of scientific societies

- Member of the Spanish Association of Mechanical Engineering from January 2010 to the present.
- Member of the European Society of Biomechanics from January 2015 to the present.
- President of the Executive Board of the Spanish Chapter of the European Society of Biomechanics.

C.7. Others

- Reviewer in JCR journals and research projects.
- Participation in the organization of the following congresses:
    - IX Congreso Iberoamericano de Ingeniería Mecánica, celebrado en Las Palmas de Gran Canaria del 17-20 de noviembre de 2013.
    - XX Congreso Universitario de Innovación Educativa en Las Enseñanzas Técnicas, celebrado en Las Palmas de Gran Canaria el 20 de julio de 2012.