Part A. PERSONAL INFORMATION

First name	Carlos Gabriel		
Family name	Juan Poveda		
Gender (*)	Male	Birth date (dd/mm/yyyy)	02/07/1991
Social Security, Passport, ID number		45844100-V	
e-mail	carlos.juan01@umh.es	URL Web	https://cgjuanpoveda.wixsite.com/home
Open Researcher and Contributor ID (ORCID) (*)		0000-0003-0793-7958	

A.1. Current position

Position	"Ramón y Cajal" Senior Research Fellow		
Initial date	01/09/2024		
Institution	Miguel Hernández University of Elche		
Department/Center	Institute of Bioengineering		
Country	Spain	Teleph. number	619944114
Key words	Dielectric permittivity, glucose, microwave devices, non-invasive sensors		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
Oct. 2022–Aug. 2024	"APOSTD" Post-Doctoral Fellow at Dep. Electronics, Computer Technology and Projects, Technical University of Cartagena (Spain)
Sept. 2023–Jan. 2024	Interruption due to parental leave
Jan. 2022–Sept. 2022	"Margarita Salas" Post-Doctoral Fellow at Dept. Systems Engineering and Automation, University of Málaga (Spain)
Jan. 2020–Dec. 2021	Post-Doctoral Fellow at CNRS Lab-STICC, Université de Bretagne Occidentale, Brest (France)
Sept. 2019–March 2020	Adjunct Professor, Dept. Materials Science, Optics and Electronics Technol., Miguel Hernández Univ. Elche (Spain)
Oct. 2019–March 2020	Freelance engineer, electronics and automation projects for industry in Alicante region (Spain)
Oct. 2015–Sep. 2019	"FPU" Pre-Doctoral Fellow at Dept. Systems Engineering and Automation, Miguel Hernández Univ. Elche (Spain)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Industry and Telecommunication Technologies	Miguel Hernández University of Elche	2019
Master's degree in Online University ICT-based Teaching (e-Learning)	Catalonia Open University	2020
Master's degree in Telecommunication Engineering	Miguel Hernández University of Elche	2014

Part B. CV SUMMARY

Carlos G. Juan is an Early Career Researcher (PhD from Nov. 2019) specialized in microwave sensors for biomedical applications. He received the highest-quality training in top leading international research groups as for microwave engineering, bioengineering and signal processing, thereby gaining a significant track record in electronic- and microwave-based biomedical engineering. He is currently a "Ramón y Cajal" Senior Research Fellow with Miguel Hernández University of Elche (UMH, Spain), where he leads cutting-edge research lines on **biomedical engineering** while getting involved in chief national and international research projects as well as collaborations with industry, hospitals and end users for knowledge and technology transfer actions.

His research career started in 2015 with nBio research group at UMH, where he completed his PhD dissertation, which was graded Cum Laude with International Doctorate Mention (2019). During his predoctoral stage he carried out two international research internships in France (2016, 2018). **He developed and coined a brand-new measurement strategy (Q_u-based sensors), whose authorship and potential is now globally acknowledged by the scientific community**. His work was recognized with the CEA-Springer Award to the Best PhD Thesis in Bioengineering 2020, the Santander Bank Young Researchers Award 2022 and the Extraordinary PhD Award 2022. In Jan. 2020 he was engaged as a Postdoctoral Fellow with the prestigious group CNRS Lab-STICC (Univ. de Bretagne Occidentale,

Brest, France), through different research projects and technology transfer contracts, for a total time of 24 months. During this period, he carried out path-breaking research on microwave-based biosensors and high-frequency electronics fabrication techniques, developing **the first biocompatible microwave sensor, which was also the first Q_u-based sensor to ever measure biologically-relevant glucose concentrations**. As a result of his works with CNRS Lab-STICC, he was awarded the *Applied Sciences* 2021 Highly Cited Paper Award, among other merits. During 2022–2024 he gained his own Postdoctoral positions at Univ. of Málaga and Technical Univ. of Cartagena. After being granted an excellence "Ramón y Cajal" fellowship, since 2024 **he leads pioneering research at UMH on sophisticated selective microwave sensors** through enticing collaborations with his national colleagues and top international researchers from CNRS Lab-STICC (France), Ontario Tech and McGill Univ. (Canada).

Dr. Juan published 1 scientific book, 2 book chapters, 18 JCR articles (+2 under review), being first and/or corresponding author of 15 of them, 18 contributions to international conferences and 15 to national conferences (in different nations). His research shows an exponentially-growing impact, garnering more than 100 citations/year during the last 5 years. He is firmly committed to **dissemination and divulgation activities** (he serves as **IEEE I&M Distinguished Lecturer**, he delivered 4 invited workshops in the prestigious international conferences IEEE IMBioC 2020 and EuMC 2020, 2022, 2024, he constantly takes part in public events, talks, websites, press…). He participated in one technology transfer-to-industry contract. He is also actively involved in **editorial** [currently **Associate Editor-in-Chief for *IEEE Trans. Instrum. Meas.*** (Q1), recipient of the "IEEE TIM Outstanding Associate Editor Award 2023 and 2024"] **and peer-review activities** for the most prestigious journals in the field (recipient of the "IEEE TIM Outstanding Reviewer Award 2022 and 2023"). He is also actively engaged in **leadership and supervision tasks**, including funded projects evaluation, publications with senior authorship, supervision of 5 undergraduate students, 2 postdoct researchers and 1 ongoing PhD student.

Part C. RELEVANT MERITS

C.1. Publications (CA = corresponding author)

C.1.1. **C. G. Juan (CA)**, B. Potelon, A. Aquino, H. García-Martínez, C. Quendo, 2024, "Multi-parameter simultaneous extraction with a novel microwave sensor based on coupled resonators," *Sci. Rep*. (Q1), vol. 14: 23076. DOI: 10.1038/s41598-024-72061-3. Citations: 2.

C.1.2. **C. G. Juan (CA)**, E. Bronchalo, B. Potelon, C. Quendo, V. F. Muñoz, J. M. Ferrádnez-Vicente, J. M. Sabater-Navarro, 2023, "On the selectivity of planar microwave glucose sensors with multicomponent solutions," *Electronics* (Q2), vol. 12(1): 191. DOI: 10.3390/electronics12010191. Citations: 17.

C.1.3. A. Martínez-Lozano, C. Blanco-Angulo, A. Rodríguez-Martínez, **C. G. Juan (CA)**, H. García-Martínez, José M. Sabater-Navarro, E. Ávila-Navarro, 2023, "Toward intraoperative brain-shift detection through microwave imaging system," *IEEE Trans. Instrum. Meas.* (Q1), vol. 72: 4011411. DOI: 10.1109/TIM.2023.3315363. Citations: 6.

C.1.4. **C. G. Juan (CA)**, 2021, *Designing Microwave Sensors for Glucose Concentration Detection in Aqueous and Biological Solutions: Towards Non-invasive Glucose Sensing*, Springer: Cham, Switzerland. ISBN: 978-3-030-76178-3. Citations: 8.

C.1.5. **C. G. Juan (CA)**, B. Potelon, C. Quendo, H. García-Martínez, E. Ávila-Navarro, E. Bronchalo, J. M. Sabater-Navarro, 2021, "Study of Q_u-based resonant microwave sensors and design of 3-D-printed devices dedicated to glucose monitoring," *IEEE Trans. Instrum. Meas.* (Q1), vol. 70: 8005716. DOI: 10.1109/TIM.2021.3122525. Citations: 46.

C.1.6. **C. G. Juan (CA)**, B. Potelon, C. Quendo, E. Bronchalo, 2021, "Microwave planar resonant solutions for glucose concentration sensing: A systematic review," *Appl. Sci.* (Q2), vol. 11(15): 7018. DOI: 10.3390/app11157018. Citations: 70.

C.1.7. A. Aquino, **C. G. Juan**, B. Potelon (CA), C. Quendo, 2021, "Dielectric permittivity sensor based on planar open-loop resonator," *IEEE Sensors Lett.*, vol. 5(3): 3500204. DOI: 10.1109/LSENS.2021.3055544. Citations: 44.

C.1.8. **C. G. Juan (CA)**, E. Bronchalo, B. Potelon, C. Quendo, E. Ávila-Navarro, J. M. Sabater-Navarro, 2019, "Concentration measurement of microliter-volume water–glucose solutions using Q factor of microwave sensors", *IEEE Trans. Instrum. Meas.* (Q1), vol. 68(7): 2621–2634. DOI: 10.1109/TIM.2018.2866743. Citations: 153.

C.1.9. **C. G. Juan (CA)**, E. Bronchalo, B. Potelon, C. Quendo, J. M. Sabater-Navarro, 2019, "Glucose concentration measurement in human blood plasma solutions with microwave sensors", *Sensors* (Q1), vol. 19(17): 3779. DOI: 10.3390/s19173779. Citations: 52.

C.1.10. **C. G. Juan (CA)**, H. García, E. Ávila-Navarro, E. Bronchalo, V. Galiano, Ó. Moreno, D. Orozco, J. M. Sabater-Navarro, 2019, "Feasibility study of portable microwave microstrip open-loop resonator for non-invasive blood glucose level sensing: Proof of concept", *Med. Biol. Eng. Comput.* (Q2), vol. 57(11): 2389–2405. DOI: 10.1007/s11517-019-02030-w. Citations: 24.

C.2. Congresses

C.2.1. E. Bronchalo, **C. G. Juan**, "Effect of dry layers in solute concentration sensing with planar resonant microwave sensors," in *Proc. 54th Europ. Microw. Conf. (EuMC)*, Paris, France, 2024, pp. 940–943. DOI: 10.23919/EuMC61614.2024.10732383. Full oral talk. International.

C.2.2. **C. G. Juan**, E. Bronchalo, J. M. Sabater-Navarro, "Influence of dry layers in solute concentration measurement with planar resonant microwave sensors," in *Proc. 2024 IEEE Int. Instrum. Meas. Technol. Conf. (I2MTC)*, Glasgow, United Kingdom, 2024. DOI: 10.1109/I2MTC60896. 2024.10560857. Full oral talk. International. C.G. Juan was session chairman. Citations: 3.

C.2.3. **C. G. Juan**, B. Potelon, C. Quendo, E. Bronchalo, J. M. Sabater-Navarro, "Addressing the selectivity and multi-parameter sensing with coupled planar microwave resonators," in *54th Europ. Microw. Conf. (EuMC)*, Paris, France, 2024. Workshop (Invited talk), Full contribution. Int.

C.2.4. N. Bermejo, J. D. Romero-Ante, J. Manrique-Córdoba, J. M. Sabater-Navarro, **C. G. Juan**, "Augmented reality holographic visualization system for surgery auxiliary visualization: Proof of concept for surgical training," in *Proc. 45th IEEE Int. Eng. Med. Biol. Conf. (EMBC)*, Sydney, Australia, 2023. DOI: 10.1109/EMBC40787.2023.10341182. Full oral talk. Int. Citations: 2.

C.2.5. Á. García, J. Manrique-Córdoba, M. Á. de la Casa-Lillo, J. M. Sabater-Navarro, **C. G. Juan**, "Enhancing surgeon's gaze strategies in endoscopic surgery during simulated surgical emergency situations thanks to computer vision," in *Proc. 45th IEEE Int. Eng. Med. Biol. Conf. (EMBC)*, Sydney, Australia, 2023. DOI: 10.1109/EMBC40787.2023.10340430. Full oral talk. Int. Cit.: 1.

C.2.6. **C. G. Juan**, B. Potelon, C. Quendo, E. Bronchalo, J. M. Sabater-Navarro, "Microwave resonating sensors: Addressing the sensitivity and selectivity challenges," in *52nd Europ. Microw. Conf. (EuMC)*, Milano, Italy, 2022. Workshop (Invited talk), Full contribution. International.

C.2.7. **C. G. Juan**, B. Potelon, C. Quendo, E. Bronchalo, J. M. Sabater-Navarro, "Single and coupled microwave resonators as glucose concentration sensors," in *50th Europ. Microw. Conf. (EuMC)*, Utrecht, The Netherlands, 2021. Workshop (Invited talk), Full contribution. International.

C.2.8. **C. G. Juan**, E. Bronchalo, B. Potelon, J. Álvarez-Pastor, J. M. Sabater-Navarro, "Use of colpanar quarter-wave resonators for glucose sensing in aqueous solutions," in *Proc. 2020 IEEE MTT-S Int. Microw. Biomed. Conf. (IMBioC)*, Toulouse, France, 2020. DOI: 10.1109/IMBIoC47321.2020.9385037. Full oral talk. International. Citations: 13.

C.2.9. **C. G. Juan**, B. Potelon, C. Quendo, E. Bronchalo, J. M. Sabater-Navarro, "Highly-sensitive glucose concentration sensor exploiting inter-resonators couplings", in *Proc. 49th Europ. Microw. Conf. (EuMC)*, Paris, France, 2019, pp. 662–665. DOI: 10.23919/EuMC.2019.8910847. Full oral talk. International. Citations: 39.

C.2.10. J. M. Vicente-Samper, E. Avila-Navarro, **C. G. Juan**, N. García, J. M Sabater-Navarro, "Design of wearable bio-patch for monitoring patient's temperature", in *Proc. 38th IEEE Int. Eng. Med. Biol. Conf. (EMBC)*, Orlando FL, USA, 2016, pp. 4792–4795. DOI: 10.1109/EMBC.2016.7591799. Full oral talk. International. Citations: 17.

C.3. Research projects

C.3.1. Research line: non-invasive microwave glucose sensors for diabetes. **C.G. Juan's main research line, entirely leaded by him**. Personal projects and funds raised with individual fellowships in this line: Ramón y Cajal (RYC2022-036257-I; AEI, MICIU, ESF+), APOSTD (CIAPOS/2021/267; Generalitat Valenciana, ESF), Margarita Salas MS00106 (Ministerio Universidades, EU), SAD-NoNeedle (Gouvernment Région Bretagne, France), FPU (FPU14/00401; Ministerio de Educación, Cultura y Deporte), which add up to 570,797'78 €. Ongoing.

C.3.2. Project: YA1001IP-68302 "Innovative microwave sensors for biomedical applications" (associated to RYC2022-036257-I; AEI, MICIU, ESF+). **Role: PI**. Full responsible for the contract

of Ms. Khadija Jaffal (ongoing PhD thesis co-funded and co-supervised by **C. G. Juan**, B. Potelon and C. Quendo). Place: CNRS Lab-STICC (Brest, France), UMH: 50,000'00 €. Ongoing.

C.3.3. Project: 101-2024-CONCYTEC-P "Technological implementation of microwave sensors devoted to glucose concentration monitoring". Funded by Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica, Republic of Peru. **Role: co-PI** with B. Potelon. Responsible for the supervision and management of Ms. Anyela Aquino's secondment during her PhD. Place: Université Paris-Saclay, CNRS Lab-STICC (Brest, France), UMH: 12,000'00 S/. = 3,099'46€. Ongoing.

C.3.4. Project: PID2022-139783OB-I00: "Non-invasive detection of breast tumors by means of microwave signals." Funded by Ministerio de Ciencia e Innovación. PI: Ernesto Ávila and Enrique Bronchalo (UMH). **Role. Researcher**. Responsible for the development of electromagnetic models of female breast and adapted tissue characterization sensors. Place: UMH: 187,875'00 €. Ongoing.

C.3.5. Project: PID2022-138206OB-C32: "Application of a digital twin to liver laparoscopic surgery for bleeding detection and real-time intraoperative replanning." Funded by Ministerio de Ciencia e Innovación. PI: José M. Sabater-Navarro (UMH). **Role. Researcher**. Responsible the development of miniaturized in-body characterization sensors. Place: UMH: 218,750 €. Ongoing.

C.3.6. Project: PID2019-111023RB-C32"Automatic suturing and assessment for robotic anastomosis competence evaluation." Funded by Ministerio de Ciencia e Innovación. PI: José María Sabater Navarro and Ernesto Ávila Navarro (UMH). **Role: Researcher**. Responsible for the development of tissue characterization sensors. Dates: June 2020-May 2023. Place: UMH: 175,929'00 €.

C.3.7. Project: DPI2016-80391-C3-2-R: "Brain-shift predictive system based on non-invasive distance measurements." Funded by Ministerio de Industria, Economía y Competitividad. PI: José María Sabater Navarro (UMH). **Role: Researcher**. Responsible for the development of antenna-based sensors. Dates: Jan. 2017-Dec. 2020. Place: UMH. Amount: 182,710'00 €.

C.3.8. Project: UGP-15-202: "Development and validation of a non-invasive glucose measurement system." Funded by FISABIO. PI: Óscar Moreno (UMH). **Role: Researcher**. Responsible for the development of the glucose sensor and driving electronics, co-responsible (with Dr. Moreno) for clinical trials. Dates: Jan. 2017-Dec. 2018. Place: UMH: 19 899'17 €.

C.3.9. Project: DPI2013-47196-C3-2-R: "Interface for the supervision and cooperative control of the intervention in hand-assisted laparoscopic." Funded by Ministerio de Economía y Competitividad. PI: José María Sabater Navarro (UMH). **Role: Researcher**. Responsible for the development of tissue-recognition sensor. Dates: Jan. 2014-Dec. 2016. Place: UMH: 108,900'00 €.

C.4. Contracts, technological or transfer merits

C.4.1. **Contract** "Projet IMPACT." International privately-funded technology-transfer contract. Companies: DGA, Paris (France); Elliptika, Brest (France); PROTECNO Circuits Imprimés, Brest (France). PI: C. Quendo. **Role: Researcher**. Responsible for metallization process for 3-D-printed microwave devices. Dates: Jan. 2021-Dec. 2021. Place: Brest, France. Amount: confidential.

C.4.2. **Direction of PhD Thesis** by Khadija Jaffal, (CNRS Lab-STICC, France and UMH, PhD completion expected July 2027), co-directed with B. Potelon and C. Quendo.

C.4.3. **Active collaboration in the direction of PhD students** C. Blanco-Angulo, A. Martíez-Lozano, J. Manrique-Córdoba, J. D. Romero-Ante, N. Bermejo-Herrero, D. Zambrana-Vinaroz and postdoc fellows Dr. O. Bakam, and Dr. N. Hamdash. All these collaborations have led to joint publications.

C.4.4. **Direction of 5 Undergraduate Theses**, including Anyela Aquino's, which resulted in the publication C.1.7 and recently in the grant of project C3.3.

C.4.5. Active participation in the whole process of **invention patent ES 2621006 A1**, "Non Invasive Device for Measuring Blood Glucose Levels and Method for its Use", from our group.

C.4.6. **Associate Editor-in-Chief** for *IEEE Trans. Instrum. Meas.* (Q1) and **Associate Technical Program Committee Chair** for IEEE I2MTC 2024 conference.

C.4.7. **Dissemination engagement:** service as **IEEE Distinguished Lecturer I&M (2025–2027)** and delivery of **4 invited talks in prestigious conf.** IEEE IMBioC 2020 and EuMC 2020, 2022, 2024.

C.4.8. **Awards and distinctions**. IEEE TIM Outstanding Associate Editor Award 2023 and 2024; IEEE TIM Outstanding Reviewer Award 2022 and 2023; Santander Bank Young Researchers Award 2022; *Applied Sciences* 2021 Highly Cited Paper Award; CEA-Springer Award to the Best PhD Thesis in Bioengineering 2020; Extraordinary PhD Award UMH 2022; among others.

C.4.9. **Evaluation of funded projects** for AEI-PID, UAX, Murcia, Euskadi and Valencia reg.