



# ENELIA CRISTINA PELÁEZ-GUTIÉRREZ

M.Sc. Biotechnology - Ph.D. Chemistry

I am a creative and enthusiastic professional who has been working on projects for clinical applications based on optical biosensor devices. I have worked in multidisciplinary environments, such as genetics, pathology, immunology, electronics and molecular biology. I have had contact with different research centres and universities, as well as in hospital centres for the management of pathogenic samples.

## CONTACT



+34 674908986



ecripeg@gmail.com



www.dr cristinapelaez.com

## CONNECT



linkedin.com/in/  
crispelaez



orcid.org/0000-0002-9482-  
4566

## PROFESSIONAL SKILLS

### Optical biosensing system

SPR, biofunctionalization strategies, immunoassays, bioapplications, nanomedicine, microfluidics

### Molecular biological tools

PCR, cloning, western blot, expression and purification of biomolecules, hybridization, ELISA

### Medical affairs

Clinical diagnosis, Therapeutic drug monitoring, infectious diseases, tuberculosis, celiac disease, colorectal cancer, biomarkers, cardiovascular diseases.

### Chemical instrumental techniques

Gas, HPLC Chromatography, mass spectrometry, RMN

### Software

Microsoft Office, Origin, GraphPad Prism, Matlab, Chemdraw, Autodesk Inventor

### Personal skills

Open attitude, curious, persistent, proactive, self-motivated, self-confident, creative. Good communication skills in public.

## LANGUAGES

Spanish – Native speaker  
English – High level (C1)  
French – Basic level



## WORK EXPERIENCE

- **2017-2019. RESEARCH TECHNICIAN / ICN2, Barcelona (Spain)**  
Research and development and project management based on optical biosensors used for clinical applications: PreDICT, Urinetest, Colontest, Tuberculosis test, POC for sintrom follow-up.
- **2015-2016. RESEARCH INTERNSHIP / ICN2, Barcelona (Spain)**  
Project: "HspX protein tuberculosis biomarker evaluated in sputum samples by plasmonic biosensing".
- **2014-2015. RESEARCH ENGINEER / Corpogen Corporation, Bogotá (Colombia).** Project: "Expression and purification of the recombinant protein HspX as tuberculosis biomarker".
- **2013-2017. RESEARCH ENGINEER / CIDEI, Bogotá (Colombia).** Project: "New biosensing system based on nanotechnology for the detection of tuberculosis markers, using layer-by-layer deposition techniques in QCM".
- **2011-2013. UNIVERSITY LECTURER / National University of Colombia, Medellín (Colombia).** Teaching activities in theoretical and practical subjects of chemistry, biochemistry and organic chemistry.



## EDUCATION

- **2015-2020. Ph.D. IN CHEMISTRY**  
Autonomous University of Barcelona (Spain).
- **2011-2015. M.Sc. BIOTECHNOLOGY.**  
National University of Colombia, Medellín (Colombia).
- **2004-2009. B.Sc. CHEMISTRY.**  
Technological University of Pereira, Pereira (Colombia).



## ARTICLES

- **Peláez E.C.,** Estévez M.C., Sousa C., Moreno M.L., Cebolla A., Lechuga L.M. A compact SPR biosensor device for the rapid and efficient monitoring of gluten free diet directly in urine. *Anal. Bioanal. Chem.*, (March 23, 2020).
- **Peláez E.C.,** Estévez M.C., Mongui A., Menéndez M.C., García M.J., Toro C., Herrera O.L., Del Portillo, P., Robledo J., Lechuga L.M. Detection and quantification of the HspX antigen in sputum samples using plasmonic biosensing: toward a real POC for tuberculosis diagnosis. *ACS infect. Dis.* (2020), 6(5), 1110-1120.
- Portela, **E.C. Peláez,** O. Calvo-Lozano, M.C. Estévez and L.M. Lechuga. Label-Free Nanoplasmonic Biosensing of Cancer Biomarkers for Clinical Diagnosis. *Biomimetic Sensing. Methods in Molecular Biology*, vol 2027 (2019). Chapter 10. pp. 115-140.
- **Peláez E.C.,** Estévez M.-C., Portela A., Salvador J.P., Marco M.-P, Lechuga L.M. Nanoplasmonic biosensor device for the monitoring of acenocoumarol therapeutic drug in plasma. *Biosensors and Bioelectronics*, 119, (2018), 149-155.

- Lopez-Muñoz G.A., Estévez M.C., **Peláez E.C.**, Homs-Corbera A., García-Hernández M.C., Imbaud J.I., Lechuga L.M.A label-free nanostructured plasmonic biosensor based on Blu-ray discs with integrated microfluidics for sensitive biodetection. *Biosensors and Bioelectronics*, 96, (2017), 260–267.
- **Peláez E.C.**, García, A., Herrera O.L., Del Portillo P. Design of a gravimetric biosensor using deposition of polyelectrolytes for detection of tuberculosis. *IEEE Sensors Journal* ISSN: 1530-437, (2014), 1-4.
- Beltrán M.C., **Peláez E.C.**, Escobar J.A., Serna L. "Pharmacognostic study for healthcare from essential oils obtained by steam distillation". In: *Colombia Investigaciones Andina* ISSN: 0124-8146 ed., (2010) v.12 fasc. 20 p. 8 - 18.



## PATENTS

- **Peláez E.C.**, Estévez M.C., Lechuga L.M. " Storing and packaging of gold sensor chips of a compact SPR biosensor device for the monitoring of gluten-free diet". 2020. (Submitted).



## THESIS

- **Ph.D. in Chemistry:** "Point-of-care nanoplasmonic biosensors for clinical diagnosis, drug monitoring and therapeutic follow-up" led by Dr. María Carmen Estevez and Dr. Laura Lechuga. Catalan Institute of Nanoscience and Nanotechnology. Autonomous University of Barcelona. Barcelona, Spain. 2020.
- **M.Sc. Biotechnology:** "Bioactive substances obtained from extracts of Colombian native fungal isolates" led by Dr. Blanca Cecilia Salazar and Maria del Socorro Yepes. Micotoxins group. National University of Colombia. Medellín, Colombia. 2015.
- **B.Sc. Chemistry:** "Antioxidant activity of dichloromethane extract of *Palicourea guianensis* Aubl." led by Dr. Juan Carlos Sepúlveda. Polyphenols group. Technological University of Pereira. Pereira, Colombia. 2009.



## RESEARCH PROJECTS AND GRANTS

- **PreDICT:** Point-of-care nanoplasmonic platforms for novel high-value diagnostics and therapy follow-up. Ministerio de Economía, Industria y Competitividad TEC2016-78515-R.
- **Urinetest:** Rapid methods of analysis of gluten immunogenic peptides in urine. Ministerio de Economía, Industria y Competitividad. Fondo Europeo de Desarrollo Regional (FEDER). RETOS-COLABORACIÓN Programme RTC-2016-5452-1.
- **Colontest:** Design and development of kits for the diagnosis of colorectal cancer in blood based on multiplex platforms. Ministerio de Economía, Industria y Competitividad. RETOS-COLABORACIÓN Programme RTC-2014-1518-1.
- **Tuberculosis Nucleosensor:** Latent tuberculosis detection using promoter region of the ribosomal RNA operon of *M. tuberculosis*. COLCIENCIAS, Colombia for supporting through the grant No. 0375-2013 with number project 6570577636375. The Universidad Central (Colombia) through the Research Cluster on Converging Sciences and Technology (NBIC). Others institutions: Nanob2A-ICN2, CIDEI company, Corpogen Corporation, CIB Corporation (Colombia), and Autonomous University of Madrid, Hospital Universitario La Paz (Spain).
- **Acenocoumarol drug Monitoring.** Nanoplasmonic biosensor device for the monitoring of acenocoumarol therapeutic drug in plasma. Research group The Nanobiotechnology for Diagnostics Group (NB4D) of Instituto de Química Avanzada de Cataluña (IQAC).



## CONFERENCES AND PRESENTATIONS

### Oral presentations

- **Peláez E.C.**, M.-C. Estevez, C. Sousa, M.L. Moreno, A. Cebolla, L.M. Lechuga. Label-free SPR monitoring of Gluten Immunogenic Peptides in Urine for Celiac Disease Follow-up. 11th Ibero-American Congress on Sensors. IBERSENSOR 2018. September 17<sup>th</sup> – 20<sup>th</sup>, 2018. Barcelona (Spain).
- **Peláez E.C.**, Estévez M.C., Mongui A., Menéndez M.C., García M.J., Toro C., Herrera O.L., Del Portillo, P., Robledo J., Lechuga L.M. "HspX protein tuberculosis biomarker evaluated in sputum samples by plasmonic biosensing". Doctoral Seminars. Autonomous University of Barcelona. May 30<sup>th</sup> – June 1<sup>st</sup>, 2018. Barcelona, Spain.
- **Peláez E.C.**, Estévez M.C., Mongui A., Menéndez M.C., García M.J., Toro C., Herrera O.L., Del Portillo, P., Robledo J., Lechuga L.M. Development of a nanosensor for Tuberculosis detection. International Workshop: Biomarkers of infectious diseases for diagnosis. December 6<sup>th</sup> – 7<sup>th</sup>, 2017. Barranquilla, Atlántico (Colombia).
- **Peláez E.C.**, Herrera O.L., Del Portillo P. "Design of a gravimetric biosensor using deposition of polyelectrolytes for detection of tuberculosis". The 9th IberoAmerican Congress on Sensors (IBERSENSOR 2014), October 11<sup>th</sup> – 15<sup>th</sup>, 2014. Bogotá (Colombia).

### Poster presentations

- **Peláez E.C.**, Estévez M.C., Mongui A., Menéndez M.C., García M.J., Toro C., Herrera O.L., Del Portillo, P., Robledo J., Lechuga L.M. "HspX protein tuberculosis biomarker evaluated in sputum samples by plasmonic biosensing". 11<sup>th</sup> Ibero-American Congress on Sensors. IBERSENSOR 2018. September 17<sup>th</sup> – 20<sup>th</sup>, 2018. Barcelona (Spain).
- **Peláez E.C.**, Estévez M.C., Del Portillo P., Herrera O.L., Robledo J., Lechuga L. "LSPR-based immunoassay for the specific detection of HspX protein biomarker related to Tuberculosis disease". Doctoral Seminars. Autonomous University of Barcelona. May 30<sup>th</sup> – June 1<sup>st</sup>, 2018. Barcelona, Spain.
- **Peláez E.C.**, M.-C. Estevez, C. Sousa, M.L. Moreno, A. Cebolla, L.M. Lechuga. "Label-free SPR Monitoring of Gluten Immunogenic Peptide in Urine for Celiac Disease Follow-up". EUROPT(R)ODE XIV. March 25<sup>th</sup>-28<sup>th</sup>, 2018. Naples, Italy.
- **Peláez E.C.**, Estévez M.C., Salvador J.P., Marco M.P., Lechuga L. "Localised Surface Plasmon Resonance Biosensor for the monitoring of Sintrom® therapeutic drug in plasma". VIII International Congress on Analytical Nanoscience and Nanotechnology. NyNA2017. July 3<sup>rd</sup> – 5<sup>th</sup>, 2017. Barcelona, Spain.
- **Peláez E.C.**, Estévez M.C., Del Portillo P., Herrera O.L., Robledo J., Lechuga L. "LSPR-based immunoassay for the specific detection of HspX protein biomarker related to Tuberculosis disease". The 3rd Institute Pasteur International Network Symposium, November 29<sup>th</sup> – December 2<sup>nd</sup>, 2016. París (France).
- **Peláez E.C.**, Estévez M.C., Salvador J.P., Marco M.P., Lechuga L. "SPR-based immunoassay for quantification of Sintrom® in serum". The 2nd Scientific Meeting of BNC-b Students. Autonomous University of Barcelona, June 29<sup>th</sup> – 30<sup>th</sup>, 2016. Barcelona (Spain).
- García M.A., Pazos J., Carvajal L.A., **Peláez E.C.**, Herrera O.L. "Resonator of quartz crystal as a low-cost nanobiosensor for the detection of *Mycobacterium Tuberculosis*". NanoAndes 2016. November 8<sup>th</sup> – 11<sup>th</sup>, 2016. Bogotá (Colombia).
- **Peláez E.C.**, Salazar B.C., Yepes M.S., Mora A.L. "Antioxidant activity and production of organic acids obtained in extracts of 25 native Colombian filamentous fungi". 30<sup>th</sup> Latin American Congress of Chemistry CLAC 2012. 47<sup>th</sup> Mexican Congress of Chemistry. October 27<sup>th</sup> – 31<sup>st</sup>, 2012. Cancún (México).

## Conferences

- "Photonic nanobiosensors for clinical applications – NanoB2A, ICN2". Central University. December 3<sup>rd</sup> 2017. Bogotá, Colombia.
- "Development of a biosensor for early tuberculosis diagnosis". 4<sup>th</sup> Consortium Network Nucleosensor Corporation Corpogen, Center for Research and Technological Development of the Electro Electronics Industry (CIDEI), National University of Colombia, Corporation for biological Research (CIB), Central University. December 6<sup>th</sup> -12<sup>th</sup>, 2017. Barranquilla, Atlántico (Colombia).
- "Surface Plasmon Resonance biosensors, microfluidics and development of biomolecules" in Biosensors course. Faculty of Engineering and Basic Sciences. Central University. October 15<sup>th</sup> – 19<sup>th</sup>, 2016. Bogotá (Colombia).
- "Label free optical biosensors for specific detection of tuberculosis" October 11<sup>th</sup> – 13<sup>th</sup>, 2016. 3<sup>rd</sup> Consortium Network Nucleosensor Corporation Corpogen, Centre for Research and Technological Development of the Electro Electronics Industry (CIDEI), National University of Colombia, Corporation for biological Research (CIB), Central University. Villavicencio (Colombia).
- "Design of a gravimetric biosensor using deposition of polyelectrolytes for detection of tuberculosis". November 10<sup>th</sup> – 12<sup>th</sup>, 2015. 2<sup>nd</sup> Consortium Network Nucleosensor Corporation Corpogen, Centre for Research and Technological Development of the Electro Electronics Industry (CIDEI), National University of Colombia, Corporation for biological Research (CIB), Central University. Medellín (Colombia).
- "Search for a new biosensing system based on nanotechnology for the detection of markers for tuberculosis, through use of layer-by-layer deposition techniques". October 1<sup>st</sup> – 2<sup>nd</sup>, 2014. 1<sup>st</sup> Consortium Network Nucleosensor Corporation Corpogen, Centre for Research and Technological Development of the Electro Electronics Industry (CIDEI), National University of Colombia, Corporation for biological Research (CIB), Central University. Paipa (Colombia).
- "Biosensors for biomedical applications". In Biosensors course. Faculty of Engineering and Basic Sciences. Central University. October 24<sup>th</sup> – 25<sup>th</sup>, 2013. Bogotá (Colombia).