Carlos Palo Nieto

carlos.nieto@angstrom.uu.se

https://orcid.org/0000-0002-1591-3828

Tlf: 0046765806453

https://www.linkedin.com/in/carlos-palo-nieto-98303371/

Keywords: Carbohydrates chemistry, materials chemistry, modification of biopolymers, nanocellulose, medicinal chemistry, synthesis and characterization of new materials, catalysis, biomedical applications.

Summary

I have a long-standing interest in the synthesis of new molecules and materials that can possess a valuable biological activity. Related to this, I have been working in different fields such as carbohydrates chemistry, catalysis, medicinal chemistry and materials chemistry. My recent research efforts have been focused on developing new materials by chemical modification of nanocellulose.

I am fascinated by the complexity and diversity of carbohydrates and the important role that they play in many biological processes. My past and future research aims are to get a better understanding of these roles and to find new chemical processes for tailoring the polysaccharide structure. New chemical approaches that allow us to develop new carbohydrate-based materials for various applications in an environmentally friendly way.

Highlights

- Design and optimization of new chemical reactions
- Chemical surface modification of materials for biomedical applications (antibacterial, antioxidant, etc.)
- Broad experience utilizing characterization techniques, such as NMR, LCMS, SEM, FTIR, TGA, etc.
- Great ability to collaborate with others. I have established a network with a multidisciplinary research team to meet our project goals
- Generation of intellectual property (patents)
- Projects funded by international funding agency (Royal Society)
- Publications in high impact journals in the different fields

Experience

UPPSALA UNIVERSITET

Materials chemist researcher (2019-current): My recent research efforts have been focused on developing new materials by chemical modification of nanocellulose. These materials have the potential to be used in biomedicine, for example, for the treatment of chronic wounds.

Medicinal chemist researcher (2017-2019): During my Postdoctoral position at the Department of Medicinal Chemistry at Biomedical centre in Uppsala I was working on developing new potential drugs by heterocycles chemistry and catalysis.

Carbohydrates chemist researcher (2015-2017): I was awarded by the Royal Society with Newton International Postdoctoral Fellowship which is a highly competitive grant (4% success) to join University of Bristol. During this period, I developed several catalytic chemical approaches for the synthesis of oligosaccharides and glyco-conjugates of biological importance.

Industry experience (2015): Regarding industry, I worked for Eurofins Villapharma Research, a company that offers services for organic synthesis and medicinal chemistry with expertise in a wide range of chemistry. Here, I developed new synthetic routes for valuable pharmaceutical compounds.

Catalysis chemist (2011, 2012, 2014-2015): I was working on catalysis chemistry, using a combination of metal and organocatalysis. Here, I developed new catalytic methods for the building of pharmacologically active molecules. This work produced also two patents where I am co-inventor. In these patents, I have planned and optimized a new chemical method for the synthesis of valuable molecules. The chemical procedures and final compounds are being exploited for companies such as XP Chemistries, producing commercial products.

Carbohydrates chemistry (2008-2013): Through my PhD I was working using carbohydrates as chiral building blocks for the development of pharmaceutical compounds and the synthesis of small molecules with biological properties.

Education

- **2013**: PhD in Pharmacy, Universidad de Sevilla, Spain.
- **2009:** Master in Pharmacy, Universidad de Sevilla, Spain.
- **2008:** Licensed in Pharmacy, Universidad de Sevilla, Spain.

Selected publications

- Blasi-Romero, M. Ångström, A. Franconetti, T. Muhammad, U. Göransson, **C. Palo-Nieto***, Natalia Ferraz*. KR-12 derivatives endow nanocellulose with antibacterial and anti-inflammatory properties: Role of conjugation chemistry. *ACS Appl. Mater. Interfaces* **2023**, *15*, *20*, 24186–24196.
- **C. Palo-Nieto***, A. Blasi-Romero, C. Sandström, D. Balgoma, M. Hedeland, M.Strømme, Natalia Ferraz*. Functionalisation of cellulose nanofibrils to develop novel ROS-sensitive biomaterials. *Mater. Adv.*, **2023**, *4*, 1555-1565.
- A. Blasi-Romero, **C. Palo-Nieto,** C. Sandström, J. Lindh, M. Strømme, N. Ferraz. In Vitro Investigation of Thiol-Functionalized Cellulose Nanofibrils as a Chronic Wound Environment Modulator. *Polymers*, **2021**, *13*, 249.
- **C. Palo-Nieto**, A. Sau, R. Jeanneret, P-A. Payard, A. Salame, M. Martins-Teixeira, I. Carvalho, L. Grimaud, M.C. Galan. Copper Reactivity can be Tuned to Catalyse the Stereoselective Synthesis of 2-deoxy Glycosides from Glycals. *Organic Letters*, **2020**, *22*, 1991.
- **C. Palo-Nieto**, A. Sau, M.C. Galan. Gold(I)-Catalyzed Direct Stereoselective Synthesis of Deoxyglycosides from Glycals. *Journal of the American Chemical Society*, **2017**, *139*, 14041.

- **C. Palo-Nieto**, A. Sau, R. Williams, M.C. Galan. "Cooperative Brønsted Acid-Type Organocatalysis for the Stereoselective Synthesis of Deoxyglycosides". *Journal of Organic Chemistry*, **2017**, *82*, 407.
- **C.Palo-Nieto**, S. Afewerki, M. Anderson, C.-W. Tai, Per Berglund, Armando Cordova. "Integrated Heterogeneous Metal/Enzymatic Multiple Relay Catalysis for Eco-Friendly and Asymmetric Synthesis". *ACS Catalysis* **2016**, *6*, 3932.
- *PCT Int. Appl.* WO 2016066835 "A Mild Catalytic Reduction of C-O Bonds Using a Recyclable Catalyst System". Inventors: Armando Córdova, Samson Afewerki, **Carlos Palo-Nieto**. 6th May **2016**.
- *PCT Int. Appl.* WO 2016096905 "Synthesis of amides and amines from aldehydes or ketones by heterogeneous metal catalysis". Inventors: Armando Córdova, Samson Afewerki, **Carlos Palo-Nieto**. 23th June **2016**.

References

- Maria Strømme: maria.stromme@angstrom.uu.se, Uppsala University (Sweden).
- Carmen Galán, m.c.galan@bristol.ac.uk, University of Bristol (England).

- More references available upon request.

Personal interests

- Sports in general: swimming, running, football, etc.
- Travelling
- Good food and socializing