Francisco Corzana López.

Universidad de La Rioja

E-mail: francisco.corzana@unirioja.es

Web: http://www.francisco-corzana.com

Conference title: Structure-based design of glycopeptides with applications in cancer therapy and diagnosis

Summary:

MUC1, a glycoprotein overexpressed in cancer cells and exhibiting abnormal glycosylation, has emerged as a potential target for cancer vaccine development.[1] The presence of anti-MUC1 antibodies has also been observed in the early stages of cancer.[2] In this presentation, we will explore the use of structured-guided designed MUC1 glycopeptides containing unnatural amino acids and/or carbohydrates as cancer vaccines and diagnostic tools for different cancer types. To illustrate the versatility of these compounds, we will present the results of vaccines testing on mice in our lab and introduce a new biosensor that can effectively distinguish between pancreatic cancer patients and healthy individuals, showing higher sensitivity and specificity compared to other clinically used biomarkers.[3-5]

References

[1] M. A. Hollingsworth, and B. J. Swanson, *Nat. Rev. Cancer* **2004**, *4*, 45.
[2] Chen, H.; Qian, J.; Werner, S.; Cuk, K.; Knebel, P.; Brenner, H. *Clin. Epidemiol.* **2017**, *9*, 517-526
[3] N. Martinez-Saez, N. T. Supekar, M. A. Wolfert, I. A. Bermejo, R. Hurtado-Guerrero, J. L. Asensio, J. Jimenez-Barbero, J. H. Busto, A. Avenoza, G. J. Boons, J. M. Peregrina, and F. Corzana, *Chem. Sci.* **2016**, *7*, 2294.

[4] I. Companon, A. Guerreiro, V. Mangini, J. Castro-Lopez, M. Escudero-Casao, A. Avenoza, J. H. Busto, S. Castillon, J. Jimenez-Barbero, J. L. Asensio, G. Jimenez-Oses, O. Boutureira, J. M. Peregrina, R. Hurtado-Guerrero, R. Fiammengo, G. J. L. Bernardes, F. Corzana, *J. Am. Chem. Soc.* **2019**, *141*, 4063.

[5] I. A. Bermejo, C. D. Navo, J. Castro-López, A. Guerreiro, E. Jiménez-Moreno, E. M. Sánchez Fernández, F. García-Martín, H. Hinou, S.-I. Nishimura, J. M. García Fernández, C. O. Mellet, A. Avenoza, J. H. Busto, G. J. L. Bernardes, R. Hurtado-Guerrero, J. M. Peregrina, F. Corzana, *Chem. Sci.* **2020**, *11*, 3996.

Biosketch:

Dr. Francisco Corzana received his PhD in Chemistry from the University of La Rioja in 2001, where he focused on synthesizing enantiomers of quaternary amino acids. He then completed two postdoctoral positions, the first at the University of Copenhagen studying the conformational behavior of starch-derived carbohydrates using molecular dynamics simulations, and the second at the *Instituto de Química Orgánica General* (IQOG, CSIC) in Madrid synthesizing modified aminoglycoside antibiotics and analyzing their conformation in solution using NMR experiments and MD simulations. In 2005, he returned to the University of La Rioja as a "Ramon y Cajal" researcher and now holds a permanent position as an associate professor. His research focuses on the synthesis and structure of glycopeptides and their use in clinical applications such as the development of cancer therapeutic vaccines and early tumor detection. His work has resulted in the preparation of several cancer vaccines that have been successful in mice. Dr. Corzana is the principal investigator of the DIRNANO Curie ITN (H2020-MSCA-ITN2020) project at the University of La Rioja, which aims to study the interactions of biocompatible nanomaterials with the innate immune system at the molecular level. Dr. Corzana has completed several research stays at prestigious universities and research groups, including the University of Oxford and the University of Cambridge. He has published over 150 articles in top journals and given more than 20 invited talks at national and international conferences. He is currently a visiting professor at the University of Cambridge.