

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION		CV date	26/11/2022
First name	Juan Luis		
Family name	Asensio Alvarez		
Gender (*)	Male	Birth date (dd/mm/yyyy)	29/06/1967
ID number	00822847E		
e-mail	juanluis.asensio@csic.es	www.iqog.csic.es	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-7536-5221		

(*) Mandatory

A.1. Current position

Position	Senior Scientist		
Initial date	Agost-2008		
Institution	Instituto de Química Orgánica General (CSIC)		
Department/Center	Departament of Bioorganic Chemistry		
Country	Spain	Teleph. number	34915622900
Key words	Glycochemistry, Molecular recognition, NMR		

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

Period	Position/Institution/Country/Interruption cause
01/03/1996 a 31/3/1998	Postdoctoral Researcher. National Institute for Medical Research. Medical Research Council. London. UK. Fellowship from the "Ministerio de Educación y Ciencia"
01/04/1998 a 28/02/1999	Postdoctoral Researcher. Instituto de Química Orgánica General (IQOG-CSIC). Postdoctoral fellowship from the CAM
01/03/1999 a 31/07/2000	Postdoctoral Researcher. Instituto de Química Orgánica General (IQOG-CSIC). Postdoctoral fellowship from the "Ministerio de Educación y Ciencia"
01/08/2000 a 31/07/2008	Tenured Scientist at the Instituto de Química Orgánica General del CSIC.

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed in Chemistry	Universidad Autónoma de Madrid (UAM)	1990
PhD	Universidad Autónoma de Madrid (UAM)	1995

(Include all the necessary rows)

Part B. CV SUMMARY (max. 5000 characters, including spaces)

Juan Luis Asensio has a degree and a PhD in Chemistry from the Universidad Autónoma de Madrid (extraordinary Thesis award). After finishing his doctoral thesis, he completed a two-year postdoctoral fellowship at the National Institute for Medical Research (MRC) in London, under the supervision of Dr. Andrew N. Lane. Subsequently, he returned to the Instituto de Química Orgánica General (IQOG-CSIC). In August 2000 he obtained the position of tenured Scientist at the CSIC, promoting to Scientific Researcher in 2008. Since the beginning of his scientific career his work has been focused on the study of molecular recognition phenomena of chemical and/or biological relevance. More specifically, his research has several main lines,



closely related to each other. First, it aims to shed light on the molecular bases of carbohydrate recognition by nucleic acids and proteins from a fundamental perspective, with special emphasis on the different factors that determine the affinity and specificity of the process. Second, his goal is to make use of this knowledge, to design new, tighter and more selective, ligands. As a third line, he has worked on the development of new methodological approaches for both the analysis of complexation processes and the identification of improved binders for medically relevant targets. As an example of his research, he has designed novel strategies, based on dynamic combinatorial chemistry, to facilitate a precise quantification of weak interactions. In addition, his group has set up novel NMR-based approaches for the screening of combinatorial mixtures. In recent years his research has been reoriented towards the interface between glycochemistry and molecular recognition. Thus, in a recent contribution his group has dissected the influence that weak cation/ π -type interactions exert on the course of glycosidation reactions. In addition, they have contributed to clarify the precise mechanism of common glycosylation reactions employed by the chemical community. Finally, it is worth mentioning that, from a methodological perspective, all this research has a markedly multidisciplinary nature, integrating organic synthesis and molecular biology, with various chemical-physical techniques such as NMR or microcalorimetry. Juan Luis has been awarded the **prize of the Royal Society of Chemistry (2002) for young researchers**, the **prize of the NMR group for young researchers (2002)** and the **Barluenga medal (2017) of the RSEQ Organic Chemistry group**.

Number of peer-reviewed articles: 111 including 21 in *J. Am. Chem. Soc.*, 4 in *Angew. Chem. Int. Ed.*, 2 in *Chemical Science*, 4 in *Nucleic Acids Research*, 2 in *Acc. Che. Res*, 1 in *Nat. Commun.*

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

1- "Binding-driven reactivity attenuation enables NMR identification of selective drug candidates for nucleic acid targets". L. Díaz-Casado, A. G. Santana, I. Gómez-Pinto, A. Villacampa, F. Corzana, J. Jiménez-Barbero, C. González, Juan Luis Asensio* **Communications Chemistry** (2022), 5(1), 137. DOI: 10.1038/s42004-022-00755-8.

2-"The glycosyl oxocarbenium ions: Structure, Conformation, Reactivity, and Interactions" A. Franconetti, A. Ardá, Juan Luis Asensio,* Y. Blériot,* S. Thibaudeau,* J. Jiménez-Barbero* **Accounts of Chemical Research** (2021), 54, 2552-2564. DOI 10.1021/acs.accounts.1c00021.

3-"Dissecting the Essential Role of Anomeric β -Triflates in Glycosylation Reactions". A.G. Santana, L. Montalvillo-Jiménez, L. Díaz-Casado, F. Corzana, P. Merino, F.J. Cañada, G. Jiménez-Osés, J. Jiménez-Barbero, A.M. Gómez, Juan L. Asensio* **J. Am. Chem. Soc.** (2020), 142, 12501-12514. DOI 10.1021/jacs.0c05525.

4-"De Novo Design of Selective Quadruplex-Duplex Junction Ligands and Structural Characterisation of their Binding Mode: Targeting the G4 Hot-Spot". A L. Díaz-Casado, I. Serrano-Chacón, L. Montalvillo-Jiménez, F. Corzana, A. Bastida, A. G. Santana,* C. González,* Juan Luis Asensio*. **Chem. Eur. J.** (2021), 27, 1–10. DOI 10.1002/chem.202005026. **Very important paper. Distinguished with the cover.**

5-"Impact of Aromatic Stacking on Glycoside Reactivity: Balancing CH/ π and Cation/ π Interactions for the Stabilization of GlycosylOxocarbenium Ions". L. Montalvillo-Jiménez, A. G. Santana, F. Corzana, G. Jiménez-Osés, J. Jiménez-Barbero, A. M. Gómez, Juan L. Asensio* **J. Am. Chem. Soc.** (2019), 141, 13372-13384. DOI 10.1021/jacs.9b03285.

6-"Finding the Right Candidate for the Right Position:A Fast NMR-assisted Combinatorial Method for Optimizing Nucleic Acids Binders". Ester Jiménez-Moreno, Laura Montalvillo-Jiménez, Andrés G. Santana, Ana M. Gómez, Gonzalo Jiménez-Osés, Francisco Corzana, Agatha Bastida, Jesús Jiménez-Barbero, Francisco Javier Cañada, Irene Gómez-Pinto, Carlos González, Juan Luis Asensio* **J. Am. Chem. Soc.** (2016), 138, 20, 6463. DOI 10.1021/jacs.6b00328

7-"A Thorough Experimental Study of CH/ π Interactions in Water: Quantitative Structure-stability Relationships for Carbohydrate/Aromatic Complexes" Ester Jiménez-Moreno, Gonzalo Jiménez-Osés, Ana M. Gómez, Andrés G. Santana, Francisco Corzana,



Agatha Bastida, Jesus Jiménez-Barbero, Juan Luis Asensio* **Chemical Science** (2015) 6, 11, 6076-6085. DOI 10.1039/c5sc02108a

8-“Modulating weak interactions for molecular recognition: A dynamic combinatorial analysis for assessing the contribution of electrostatics to the stability of CH/ π bonds in water”. E. Jiménez-Moreno, Ana M. Gómez, A. Bastida, F. Corzana, G. Jiménez-Oses, J. Jiménez-Barbero, Juan Luis Asensio* **Angew. Chem. Int. Edit.** (2015) 54, 14, 4344-4348. DOI 10.1002/anie.201411733.

9-“Chemical interrogation of drug/RNA complexes: From chemical reactivity to drug design”. E. Jiménez-Moreno; I. Gómez-Pinto; F. Corzana; A. G. Santana; J. Revuelta; A. Bastida; J. Jiménez-Barbero; C. González; Juan Luis Asensio* **Angew. Chem. Int. Edit.** (2013) 52, 3148-3151. DOI 10.1002/anie.201209434.

10-“A dynamic combinatorial approach for the analysis of weak carbohydrate:aromatic complexes: Dissecting facial selectivity in CH/ π stacking interactions”. A. G. Santana; E. Jiménez-Moreno; A. M. Gómez; F. Corzana; C. González; G. Jiménez-Oses; J. Jiménez-Barbero; Juan Luis Asensio* **J. Am. Chem. Soc.** (2013) 135, 3347-3350. DOI 10.1021/ja3120218

11-“Novel dimeric structure of phage phi-29 encoded protein p56: insights into uracil-DNA glycosylase inhibition”. Juan Luis Asensio,* L. Perez-Lago, J. M. Lázaro, C. Gonzalez, G. Serrano-Heras, Margarita Salas* **Nucleic Acids Research** (2011) 39, 9779-9788. DOI 10.1093/nar/gkr667

12-“Role of Aromatic Rings in the Molecular Recognition of Aminoglycoside Antibiotics: Implications for Drug Design”. Tatiana Vacas, Francisco Corzana, Gonzalo Jimenez-Oses, Carlos González, Ana M. Gomez, Agatha Bastida, Julia Revuelta, and Juan Luis Asensio* **J. Am. Chem. Soc.** (2010) 132, 12074-12090. DOI 10.1021/ja1046439.

13-“NMR-based Analysis of Aminoglycoside Recognition by the Resistance Enzyme ANT(4’): The Pattern of OH/NH₃⁺ Substitution Determines the Preferred Antibiotic Binding Mode and is Critical for Drug Inactivation”. Julia Revuelta, Tatiana Vacas, Mario Torrado, Francisco Corzana, Carlos Gonzalez, Jesús Jiménez-Barbero, Margarita Menendez, Agatha Bastida,* and Juan Luis Asensio* **J. Am. Chem. Soc.** (2008) 130, 15, 5086-5103. DOI 10.1021/ja076835s.

14-“The Pattern of Distribution of Amino Groups Modulates the Structure and Dynamics of Natural Aminoglycosides: Implications for RNA Recognition”. F. Corzana, I. Cuesta, F. Freire, J. Revuelta, M. Torrado, A. Bastida, J. Jimenez-Barbero, Juan Luis Asensio* **J. Am. Chem. Soc.** (2007) 129, 2849-2865. DOI 10.1021/ja066348x.

15-“Exploring the use of conformationally locked aminoglycosides as a new strategy to overcome bacterial resistance”. Agatha Bastida, Ana Hidalgo, Jose Luis Chiara, Mario Torrado, Francisco Corzana, Jose Manuel Cañadillas, Patrick Groves, Eduardo Garcia-Junceda, Carlos Gonzalez, Jesús Jimenez-Barbero and Juan Luis Asensio* **J. Am. Chem. Soc.** (2006) 128, 1, 100-116. DOI 10.1021/ja0543144.

16-“A Simple Structural-Based Approach to Prevent Aminoglycoside Inactivation by Bacterial Defense Proteins. Conformational Restriction Provides Effective Protection against Neomycin-B Nucleotidylation by ANT4”. Juan Luis Asensio,* Ana Hidalgo, Agatha Bastida, Mario Torrado, Francisco Corzana, Eduardo García Junceda, Javier Cañada, Jose Luis Chiara, and Jesús Jiménez-Barbero **J. Am. Chem. Soc.** (2005) 127, 23, 8278-8279. DOI 10.1021/ja051722z.

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster).

-**Introductory Workshop on Biomedical Glycoscience** San Sebastian. 3-5th June 2019. **Invited Lecture:**“ Aminoglycoside antibiotics: From chemical biology to drug design”.

-**Department of Chemistry. University of Cambridge.** United Kingdom. 15 de Marzo de 2017. **Invited Lecture:**“ New approaches for the design of RNA ligands based on carbohydrates: from rational design to combinatorial chemistry”.

-**4th RSEQ ChemBio group Meeting.** Barcelona. 5-7th February 2018. **Invited Lecture:** “Glycochemistry and molecular recognition: from rational design to combinatorial chemistry”



- **Conferences integrated in the Organic Chemistry doctorate program organized by the Universidad Autonoma de Barcelona.** Barcelona. 25 of May, 2019. **Invited Lecture:** "Glycochemistry and molecular recognition: from rational design to combinatorial chemistry".

-**Symposium 2017 Barluenga Lectureship** Oviedo. 26-27th October. **Invited Lecture:** "New approaches for the design of RNA ligands based on carbohydrates: from rational design to combinatorial chemistry".

-**XX Scientific week Antonio Gonzalez.** Instituto Universitario de Bio-orgánica "Antonio González". University of La Laguna. Tenerife 4-7th October 2016. **Invited Lecture:** "Studies on the molecular recognition of bio-active glycosides. From rational design to combinatorial chemistry".

-**Symposium 2015 Barluenga Lectureship.** Oviedo. 26-27th October 2015. **Invited Lecture:** "New approaches for the design of RNA ligands based on carbohydrates: from rational design to combinatorial chemistry".

-**14th European Carbohydrate Symposium** Lugar: Lubeck (Alemania). October 2007. **Invited Lecture:** "Exploring the use of conformationally locked aminoglycosides as a new strategy to overcome bacterial resistance".

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

-**Project Reference:** PID2019-107476GB-I00. **Title:** Glicoquímica y reconocimiento molecular: análisis de procesos de glicosidación y su modulación por medio de interacciones catión/ π . **Role:** IP. **Funded by:** Ministerio de ciencia e innovación. **Period:** 01/07/2020-31/06/2023. **Granted amount:** 145200 euros.

-**Project Reference:** Marie Sklodowska Curie Actions - Reintegration 2018 Finalidad: Posdoctoral. **Entidad financiadora:** European Commission. **Period:** 01/01/2020-31/12/2021 **Entidad de realización:** Instituto de Química Orgánica General. **Role:** IP. **Granted amount:** 172932.48 euros.

-**Project Reference:**17-0045. **Title:** Aromatic stacking in glycochemistry: Can glycosyl cations be tamed?. **Role:** IP. **Funded by:** Mizutani Foundation for Glycosciences. **Period:** 01/04/2017-1/4/2018. **Granted amount:** 40000 euros.

-**Project Reference:** CTQ2016-79255-P. **Title:** Studies on the molecular recognition of glycosides: molecular basis and optimization of bio-active compounds. **Role:** IP. **Funded by:** Ministerio de Economía y competitividad. **Period:** 01/01/2017-31/12/2019. **Granted amount:** 159720 euros.

-**Project Reference:** CTQ2013-45538-P. **Title:** Aproximaciones al diseño de nuevos ligandos de ARN basados en carbohidratos: de la química combinatoria al diseño racional. **Role:** IP. **Funded by:** Ministerio de Economía y competitividad. **Period:** 01/01/2014-31/12/2016. **Granted amount:** 84000 euros.

-**Project Reference:**CTQ2010-19073. **Title:** Estudios sobre reconocimiento molecular de aminoglicósidos por ARN ribosómico y enzimas de resistencia: aproximaciones al diseño de nuevos agentes antimicrobianos. **Role:** IP. **Funded by:** Ministerio de Ciencia e Innovación. **Period:** 01/01/2011-31/01/2014. **Granted amount:** 85000 euros.

-**Project Reference:** CTQ2007-67403/BQU. **Title:** Aproximaciones al diseño de nuevos agentes terapéuticos basados en carbohidratos. **Role:** IP. **Funded by:** Ministerio de Educación y Ciencia- **Period:** 01/01/2008-31/12/2010. **Granted amount:** 160000 euros.

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

-**Título propiedad industrial registrada:** Procedimiento de Obtención de Glicoconjugados **Inventores/autores/obtentores:** Manuel José Nieto Domínguez; María Jesús Martínez Hernández; Francisco Javier Cañada Vicinay; Andrés González Santana; Alicia Prieto Aorzamco; Juan Luis Asensio Alvarez

Entidad titular de derechos: Consejo Superior de Investigaciones Científicas - CSIC

Nº de solicitud: P201930082

País de inscripción: España, Comunidad de Madrid. **Fecha de registro:** 04/02/2019.