Part A. PERSONAL INFORMATION

CV date	26/09/2022

First and Family name	Beatriz Trastoy Bello

A.1. Current position

Name of University/Institution	IIS Biocruces Bizkaia		
Address and Country	Plaza de Cruces s/n, 48903, Barakaldo, Bizkaia		
Current position	Group Leader	From	01/01/2022
Key words	Glycobiology, Biological Chemistry, Enzymology, Glycoside Hydrolyses, Antibodies, Autoimmune Disease, Structural Biology, Immunology		

A.2. Education

PhD	University	Year
Ph.D in Chemistry	Universidad Autónoma de Madrid	2011
Bachelor of Pharmacy	Universidade de Santiago de Compostela	2005

Part B. CV SUMMARY

My interest in the field of structural biology and glycobiology was first aroused during my PhD. studies at the Institute of General Organic Chemistry (**CSIC, Spain, 2006-2010**) where I worked on the synthesis of glycoclusters and the biophysical study of lectin-carbohydrate interactions, under the supervision of **Prof. Chiara**. I then performed my postdoctoral studies abroad at **Prof. Sundberg's research group**, in the Boston Biomedical Research Institute and the **University of Maryland, USA (2011-2016).** During that time, I trained in X-ray crystallography and protein biophysics and became strongly interested in the study of the biochemistry of bacterial enzymes and the function of the glycosylation on proteins of the immune system (e.g. antibodies, Fc gamma receptors). In 2016, I returned to Spain and joined **Prof. Guerin Laboratory at CIC bioGUNE, Spain** (2016-2021), under the **'Juan de la Cierva-Incorporación' program, postdoctoral research fellowship for outstanding scientists from the Spanish Government.** There, I have continued my work from my postdoctoral stay in Dr. Sundberg laboratory based on the study of the mechanism of substrate recognition by bacterial endoglycosidases, involved in the processing of *N*-glycans in IgG antibodies. Moreover, I was also involved in the study of a group of essential Carbohydrate Active enZymes (CAZymes), critical for the cell envelope biosynthesis of *Mycobacterium tuberculosis*, as others involved in the processing of the diet by the gut microbiome and their benefits effect in human health. In 2022, I was awarded with the prestigious **"Ramon y Cajal" grant, Spanish Government program that promotes the incorporation of researchers with an excellent track record at R&D centers and funded the Structural Glycoimmunology Group at IIS Biocruces Bizkaia** (Spain). The main scope of my research group is **understanding the molecular mechanisms of aberrant glycosylation involved in autoimmunity**.

Part C. RELEVANT MERITS

C.1. Publications

1. García-Alija, M., Du, J. J., Ordoñez, I., Diz-Vallenilla, A., Moraleda-Montoya, A., Sultana, N., Huynh, C. G., Li, C., Donahue, T. C., Li, C., Wang, L.-X., **Trastoy, B.*,** Sundberg, E. J.*, Guerin, M. E.* (**2022**) Mechanism of cooperative *N*-glycan processing by the multi-modular endoglycosidase EndoE. ***Nat. Comm.*** *13*, 1137 ***co-corresponding author. Impact Factor: 14.82. First quartile (D1). *Nature Communications* Editors' Highlights (2022)**
2. **Trastoy, B.#*,** Du, J. J., García-Alija, M., Li, C., Klontz, E. H., Wang, L.-X., Sundberg, E. J.*, Guerin, M. E.* (**2022**) Sculpting therapeutic monoclonal antibody *N*-glycans using endoglycosidases. ***Curr. Opin. Struc. Biol.*** *72,* 248-259 **#co-first author and *co-corresponding author. Impact Factor: 6.81. First quartile (Q1).** Review.
3. Anso, I., Basso, L. G. M., Wang, L., Marina, A., Páez-Pérez, E. D., Jäger, C., Gavotto, F., Tersa, M., Perrone, S., Contreras, F.-X., Prandi, J., Gilleron, M., Linster, C. L., Corzana, F., Lowary, T. L., **Trastoy, B.*,** and Guerin, M. E.* (**2021**) Molecular ruler mechanism and

interfacial catalysis of the integral membrane acyltransferase PatA. ***Sci. Adv.*** 7, eabj4565. ***co-corresponding author. Impact Factor: 14.14. First decile (D1).**

4. **Trastoy, B.***#, Du, J. J.#, Li, C., García-Alija, M., Klontz, E.H., Roberts, B. R., Donahue, T. C., Wang, L.-X., Sundberg, E. J., Guerin, M. E. (**2021**) GH18 endo-β-N-acetylglucosaminidases use distinct mechanisms to process hybrid-type N-linked glycans. ***J. Biol. Chem.*** 297, 101011. **#co-first author and *co-corresponding author. Impact Factor: 5.15. Second quartile (Q2)**

5. **Trastoy, B.**,# Naegeli, A.,# Anso, I.,# Sjögren, J., Guerin, M. E. (**2020**) Structural basis of mammalian mucin processing by the human gut *O*-glycopeptidase OgpA from *Akkermansia muciniphila*. ***Nat. Commun.*** *11*, 4844. **#co-first author. 2. Impact Factor: 12.1.**

6. Rodrigo-Unzueta, A., Ghirardello, M., Urresti, S., Delso, I., Gigante, D., Anso, I., **Trastoy, B.,** Comino, N., Tersa, M., D'Angelo, C., Ciguente, J. O., Marina, A., Liebau, J., Mäler, L., Chenal, A., Albesa-Jové, D., Merino, P. and Guerin, M.E. (2020) Dissecting the Structural and Chemical Determinants of the "Open-to-Closed" Motion in the Mannosyltransferase PimA from Mycobacteria. ***Biochemistry***. 59, 32, 2934-2945. **Impact Factor: 2.9.**

7. Liebau, J., Tersa, M., **Trastoy, B.**, Patrick, J., Rodrigo-Unzueta, A., Corzana, F. Sparrman, T. Guerin, M. E., Mäler, L. (2020) Unveiling the activation dynamics of a fold-switch bacterial glycosyltransferase by ^{19}F NMR. ***J. Bio. Chem.*** 295 (29) 9868-9878. **Impact Factor: 4.2.**

8. **Trastoy, B.**,#* Du, J. J.,# Klontz, E. H., Li, C., Cifuente, J. O., Wang, L.X., Sundberg, E. J.,* Guerin, M. E.* (**2020**) Structural basis of mammalian high-mannose N-glycan processing by human gut Bacteroides. ***Nat. Commun.*** *11*, 899. **#co-first author and *co-corresponding author. Highlighted** as **F1000Prime article** (2020). **Impact Factor: 12.1.**

9. Sastre, D. E., Basso, L. G. M., **Trastoy, B.**, Cifuente, J. O., Contreras, X., Gueiros-Filho, F., de Mendoza, D., Navarro, M. V. A. S., and Guerin, M. E. (**2020**) Membrane fluidity adjusts the insertion of the transacylase PlsX to regulate phospholipid biosynthesis in Gram-positive bacteria. ***J. Biol. Chem.*** *7*, 2136-2147. **Highlighted** in the *Lipid News* section of ASBMB Today (2020). **Impact Factor: 4.2.**

10. Du, J. J., Klontz, E. H., Guerin, M. E., **Trastoy, B.**,* and Sundberg, E. J.* (5/4) (**2020**) Structural insights into the mechanisms and specificities of IgG-active endoglycosidases. ***Glycobiology***. *30*, 268-279. Review. ***co-corresponding author. Impact Factor: 4.0.**

11. Klontz, E. H.#, **Trastoy, B.#**, Deredge, D., Fields, J. K., Li, C., Orwenyo, J., Marina, A., Beadenkopf, R., Günther, S., Flores, J., Wintrode, P. L., Wang, L. X., Guerin, M. E., and Sundberg, E. J. (**2019**) Molecular basis of broad spectrum *N*-glycan specificity and processing of therapeutic IgG monoclonal antibodies by Endoglycosidase S2. ***ACS Cent. Sci***. *5*, 524–538. **#co-first author. Highlighted** as **F1000Prime article (2019)**. **Impact Factor: 12.7.**

12. Cifuente, J. O., Comino, N., **Trastoy, B.**, D'Angelo, C., and Guerin, M. E. (**2019**) Structural basis of glycogen metabolism in bacteria. ***Biochem. J.*** *476*(14) 2059-2092. Review. **Impact Factor: 4.3.**

13. Albesa-Jové, D., Cifuente, J. O., **Trastoy, B.**, and Guerin M. E. (**2019**) Quick-soaking of crystals reveals unprecedented insights into the catalytic mechanism of glycosyltransferases. ***Methods Enzymol.*** 621, 261-279. Review. **Impact Factor: 2.0**

14. **Trastoy, B.#**, Klontz, E. H.#, Orwenyo, J., Marina, A., Wang, L.-X., Sundberg, E. J., and Guerin, M. E. (**2018**) Structural basis for the recognition of complex-type *N*-glycans by Endoglycosidase S. ***Nat. Commun.*** *9*, 1874. **#co-first author. Impact Factor: 12.1.**

15. Tersa, M., Raich, L., Albesa-Jové, D., **Trastoy, B.**, Prandi, J., Gilleron, M., Rovira, C., and Guerin, M. E. (**2018**) The Molecular Mechanism of Substrate Recognition and Catalysis of the Membrane Acyltransferase PatA from Mycobacteria. ***ACS Chem. Biol.*** **13**, 131–140. **Editor's choice. Impact Factor: 4.4.**

16. **Trastoy, B.#**, Lomino, J. V., Pierce, B. G., Carter, L. G., Gunther, S., Giddens, J. P., Snyder, G. A., Weiss, T. M., Weng, Z., Wang, L.-X., and Sundberg, E. J. (**2014**) Crystal structure of Streptococcus pyogenes EndoS, an immunomodulatory endoglycosidase specific for human IgG antibodies. ***Proc. Natl. Acad. Sci. USA*** *111*, 6714–6719. **#first author. Impact Factor: 9.4.**

17. **Trastoy, B.#**, Lomino, J. V., Wang, L.-X., and Sundberg, E. J. (**2013**) Liquid-liquid diffusion crystallization improves the X-ray diffraction of EndoS, an endo-β-*N*-acetylglucosaminidase from *Streptococcus pyogenes* with activity on human IgG. ***Acta***

Crystallogr. Sect. F Struct. Biol. Cryst. Commun. *69*(12):1405-10. **[#]first author. Impact Factor: 0.6.**

18. Perez-Ojeda, M. E., **Trastoy, B.**, Rol, A. Chiara, M. D., Garcia-Moreno, I. and Chiara, J. L. (**2013**) Controlled Click-Assembly of Well-Defined Hetero-Bifunctional Cubic Silsesquioxanes and Their Application in Targeted Bioimaging. ***Chem. Eur. J.*** *19*(21) 6630-6640. **Impact Factor: 4.9**.

19. **Trastoy, B.**,[#] Bonsor, D. A., Pérez-Ojeda, M. E., Jimeno, M. L., Méndez-Ardoy, A., García Fernández, J. M., Sundberg, E. J., and Chiara, J. L. (**2012**) Synthesis and biophysical study of disassembling nanohybrid bioconjugates with a cubic octasilsesquioxane core. ***Adv. Funct. Mater.*** *22*(15), 3191–3201. **[#]first author. Impact Factor: 16.8.**

20. Perez-Ojeda, M.E., **Trastoy, B.**, Lopez-Arbeloa, I., Banuelos, J., Costela, A., Garcia-Moreno, I., and Chiara, J. L. (**2011**) Click Assembly of Dye-Functionalized Octasilsesquioxanes for Highly Efficient and Photostable Photonic Systems. ***Chem. Eur. J.*** *17*(47) 13258-13268. **Impact Factor: 4.9.**

21. Suarez, J. R., **Trastoy, B.**, Perez-Ojeda, M. E., Marin-Barrios, R. and Chiara, J. L. (**2010**) Nonafluorobutanesulfonyl Azide: A Shelf-Stable Diazo Transfer Reagent for the Synthesis of Azides from Primary Amines. ***Adv. Synth. Catal.*** 14(15) 2515-2520. **Impact Factor: 5.8.**

22. **Trastoy, B.[#]**, Pérez-Ojeda, M. E., Sastre, R., and Chiara, J. L. (**2010**) Octakis(3-azidopropyl)octasilsesquioxane: A versatile nanobuilding block for the efficient preparation of highly functionalized cube-octameric polyhedral oligosilsesquioxane frameworks through click assembly. ***Chem. Eur. J.*** *16*, 3833–3841. **[#]first author. Impact Factor: 4.9.**

23. Sastre, R., Martin, V., Garrido, L., Chiara, J.L., **Trastoy, B.**, Garcia, O., Costela, A., and Garcia-Moreno, I. (**2009**) Dye-Doped Polyhedral Oligomeric Silsesquioxane (POSS)-Modified Polymeric Matrices for Highly Efficient and Photostable Solid-State Lasers. ***Adv. Funct. Mater.*** *19*(20) 3307-3316. **Impact Factor: 16.8.**

C.2. Patents

1. Patent application number **PCT/ES2010/070747** "Polyhedral oligomeric silsesquioxanes with an azide or azol group, procedure of obtaining and uses." Chiara J. L. and **Trastoy B.**, filed November 18th, issued on May 26th, **2011**.
2. Patent application number **PCT/US2014/066197**. "Hyper-Glycosylated Antibodies with Selective Fc Receptor Binding." Sundberg E.J. and **Trastoy B.,** filed November 18th, 2013. Registered November 18th, 2014. **US Patent Number 10/745,463** issued on August 18, 2020.

C.3. Dissemination activities

Selected contributions to international conferences

1. Chemoenzymatic glycoengineering of therapeutic monoclonal antibodies. **3rd Glycobasque Meeting** (Derio, Basque Country). 2020. Oral communication
2. **Trastoy B.**; Klontz E.H.; Chao L., Wang L.X., Sundberg E.J.; Guerin, M.E. Enzymatic tools to glycoengineer antibodies. **Gordon Research Conference in Glycobiology** (Lucca, Italy), **2019**. Poster.
3. **Trastoy B**.; Klontz E.; Orwenyo J., Marina A., Wang L.X., Sundberg E.J.; Guerin, M.E. Enzymatic tools to glycoengineer antibodies. Iberian Day. **29th International Carbohydrate Symposium** (Lisboa, Portugal), **2018**. **Oral communication**.
4. **Trastoy B.**, Klontz E., Sundberg E.J., Guerin, M.E. Enzymatic tools to glycoengineer antibodies. **12th Carbohydrate Bioengineering Meeting** (CBM12), (Vienna, Austria), **2017**. Flash oral presentation and poster.
5. **Trastoy, B.** ., Lomino J.V., Pierce B.G., Carter L.G., Günther S., Giddens J.P., Snyder G.A., Weiss T.M., Weng Z., Wang L.X., Sundberg E.J. Crystal Structure of *Streptococus pyogenes* EndoS, an Immunomodulatory Endoglycosidase specific for Human IgG Antibodies. **44th Mid-Atlantic Macromolecular Crystallography Meeting and 11th Annual SER-CAT Symposium**, (Rockville, MD, USA), **2014**. **Oral communication. Oral Presentation Award.**
6. **Trastoy B**., Lomino J.V., Pierce B.G., Carter L.G., Günther S., Giddens J.P., Snyder G.A., Weiss T.M., Weng Z., Wang L.X., Sundberg E.J. Crystal structure of EndoS, an immunomodulatory endoglycosidase specific for human IgG antibodies. **16th Annual**

International Meeting of the Institute of Human Virology (Baltimore, MD, USA), **2014**. Poster. Published in *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *66*, 86, **2014**. Poster.

7. **Trastoy B.**, Lomino J.V.; Pierce B.G. Carter L.G., Günther S., Giddens J.P.; Snyder G.A., Weiss T.M., Weng Z., Wang L.X., Sundberg E.J. Crystal structure of EndoS, an immunomodulatory endoglycosidase specific for human IgG antibodies. **23rd International Union of Crystallography (IUCr) Congress and General Assembly, Montreal** (Canada), **2014**. Poster. **Poster presentation award**.