Biosketch

Univ.-Prof.in Dipl.-Ing.in Dr.in Kristina Djinović-Carugo

Position in CoE: Key Researcher

Personal Details

Place of birth	Ljubljana, Slovenia
Nationality	Slovenian
Children	1 (1994)
Affiliation:	University of Vienna, EMBL Grenoble
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Profile	ReseacherID: AAW-1167-2021
List of publications	ORCID: 0000-0003-0252-2972
Academic age	30 years since PhD

Academic Career and Positions Held

I earned a **Master's degree in chemistry** from **University of Ljubljana**, Slovenia, in **1989** as well as my **PhD** in Structural Biology in 1992, with the research performed at the **University of Pavia**, Italy. Subsequently, I continued to work as a PostDoc at University of Pavia before I moved in 1995 to **EMBL Heidelberg**, Germany, as a PostDoc with Matti Saraste, financed by EMBL long-term fellowship. Subsequently, I was an EMBL **staff scientist**. In **1999**, I moved to **Sincrotrone Trieste – Elettra**, Italy, as a head of Structural Biology Laboratory and subsequently as **Head of Unit of Structural Biology and Crystallography**. In **2004**, I accepted a **full professorship** in Molecular Structural Biology at the **University of Vienna**. From **2009–2022** I served as the **Head** of the **Department of Structural and Computation Biology**. From 2009–2016, I was Director of Laura Bassi Excellence Center for Optimal Structural Studies. Since 2001, I have held a visiting professorship in molecular structural biology at the University of Ljubljana, Slovenia. From July **2022**, I am **Director of EMBL Grenoble**, while remaining 25% employed with the University of Vienna, where I maintain an active research group.

Scientific Achievements and Scientific Contribution to the CoE

Scientific Achievements. I have authored 146 publications, which appeared in international peer reviewed and several in high visibility journals. My research spans a variety of topics, in particular structure-function analysis of **metallo-enzymes** involved in protection from chemical and oxidative damage and structural biology of actin-based cytoskeleton, with focus on muscle Z-disk. I determined the structure of the yeast Cu, Zn superoxide dismutase, and the structure of a **novel nickel-dependent superoxide dismutase**. Since a decade this branch of my research has focused on **structure-function relations studies on chlorite-dismutases**, using **X-ray crystallography** combined with **molecular biophysics** and **biochemistry**. My second branch of research revolves around **molecular mechanisms** underlying the **architecture and assembly** of the striated **muscle Z-discs** – boundaries between adjacent sarcomeres, using an **integrative structural biology** approach on reconstituted Z-disc complexes, where I contributed several seminal structures.

Scientific Contribution to the CoE. My expertise in structural biology of diverse biological systems will contribute to the elucidation of molecular mechanisms of **guanidine** (a nitrogen fertilizer) **degradation by guanidinases in comammox** microbes and in **structural biology** and structure-informed **engineering** to **repurpose enzymes** with roles in protein metabolism and microbe-microbe interactions **to catalyze the transformation of pharmaceuticals**.

10 Most Important Publications (*relevant for the CoE)

1. Sponga, A.; Arolas, J. L.; (24 authors); **Djinović-Carugo, K.** Order from Disorder in the Sarcomere: FATZ Forms a Fuzzy but Tight Complex and Phase-Separated Condensates with α-Actinin. *Sci. Adv.* **2021**, *7* (22), eabg7653. *https://doi.org/10.1126/sciadv.abg7653*.
2. *Pinotsis, N.; Zielinska, K.; Babuta, M.; Arolas, J. L.; Kostan, J.; Khan, M. B.; Schreiner, C.; Salmazo, A.; Ciccarelli, L.; Puchinger, M.; Gkougkoulia, E. A.; Ribeiro, E. de A.; Marlovits, T. C.; Bhattacharya, A.; **Djinovic-Carugo, K.** Calcium Modulates the Domain Flexibility and Function of an α-Actinin Similar to the Ancestral α-Actinin. *Proc. Natl. Acad. Sci. U.S.A.* **2020**, *117* (36), 22101–22112. *https://doi.org/10.1073/pnas.1917269117*.
3. *Mlynek, G.; Kostan, J.; Leeb, S.; **Djinović-Carugo, K.** Tailored Suits Fit Better: Customized Protein Crystallization Screens. *Crystal Growth & Design* **2020**, *20* (2), 984–994. *https://doi.org/10.1021/acs.cgd.9b01328*.
4. ***Djinović-Carugo, K.**; Carugo, O. Naked Metal Cations Swimming in Protein Crystals. *Crystals* **2019**, *9* (11), 581. *https://doi.org/10.3390/cryst9110581*.
5. *Schaffner, I.; Mlynek, G.; Flego, N.; Pühringer, D.; Libiseller-Egger, J.; Coates, L.; Hofbauer, S.; Bellei, M.; Furtmüller, P. G.; Battistuzzi, G.; Smulevich, G.; **Djinović-Carugo, K.**; Obinger, C. Molecular Mechanism of Enzymatic Chlorite Detoxification: Insights from Structural and Kinetic Studies. *ACS Catal.* **2017**, *7* (11), 7962–7976. *https://doi.org/10.1021/acscatal.7b01749*.
6. Ribeiro, E. de A.; Pinotsis, N.; Ghisleni, A.; Salmazo, A.; Konarev, P. V.; Kostan, J.; Sjöblom, B.; Schreiner, C.; Polyansky, A. A.; Gkougkoulia, E. A.; Holt, M. R.; Aachmann, F. L.; Žagrović, B.; Bordignon, E.; Pirker, K. F.; Svergun, D. I.; Gautel, M.; **Djinović-Carugo, K.** The Structure and Regulation of Human Muscle α-Actinin. *Cell* **2014**, *159* (6), 1447–1460. *https://doi.org/10.1016/j.cell.2014.10.056*.
7. Kostan, J.; Salzer, U.; Orlova, A.; Törö, I.; Hodnik, V.; Senju, Y.; Zou, J.; Schreiner, C.; Steiner, J.; Meriläinen, J.; Nikki, M.; Virtanen, I.; Carugo, O.; Rappsilber, J.; Lappalainen, P.; Lehto, V.; Anderluh, G.; Egelman, E. H.; **Djinović-Carugo, K.** Direct Interaction of Actin Filaments with F - BAR Protein Pacsin2. *EMBO Rep* **2014**, *15* (11), 1154–1162. *https://doi.org/10.15252/embr.201439267*.
8. *Mlynek, G.; Sjöblom, B.; Kostan, J.; Füreder, S.; Maixner, F.; Gysel, K.; Furtmüller, P. G.; Obinger, C.; Wagner, M.; Daims, H.; **Djinović-Carugo, K.** Unexpected Diversity of Chlorite Dismutases: A Catalytically Efficient Dimeric Enzyme from Nitrobacter Winogradskyi. *J Bacteriol* **2011**, *193* (10), 2408–2417. *https://doi.org/10.1128/JB.01262-10*.
9. Kostan, J.; Sjöblom, B.; Maixner, F.; Mlynek, G.; Furtmüller, P. G.; Obinger, C.; Wagner, M.; Daims, H.; **Djinović-Carugo, K.** Structural and Functional Characterisation of the Chlorite Dismutase from the Nitrite-Oxidizing Bacterium "Candidatus Nitrospira Defluvii": Identification of a Catalytically Important Amino Acid Residue. *Journal of Structural Biology* **2010**, *172* (3), 331–342. *https://doi.org/10.1016/j.jsb.2010.06.014*.
10. Wuerges, J.; Lee, J.-W.; Yim, Y.-I.; Yim, H.-S.; Kang, S.-O.; **Djinović-Carugo, K.** D. Crystal Structure of Nickel-Containing Superoxide Dismutase Reveals Another Type of Active Site. *Proc. Natl. Acad. Sci. U.S.A.* **2004**, *101* (23), 8569–8574. *https://doi.org/10.1073/pnas.0308514101*.