Artificial metallo-proteins for photocatalytic water splitting: stability and activity in artificial photosynthesis

Opdam, L.V.

CURRICULUM VITAE

Laura Opdam was born on the 16th of June in 1992 in Zoetermeer, the Netherlands. From 2005 to 2012 she attended high school at the Veurs Lyceum in Leidschendam, with a specialization in both Nature & Health and Nature & Technology. She acquired her Bachelor's degree in Molecular Science and Technology from Leiden University in 2015. During her bachelor's internship she specialized in the direction of biochemistry, working with two photoactive membrane proteins. She started her master's in chemistry following the Holland Research School of Molecular Chemistry program shared between Leiden University, the University of Amsterdam and the Vrije Universiteit Amsterdam in 2015. During her master's internship she worked in the group of prof. Huub de Groot under the supervision of prof. Wim de Grip where she became familiar with both solid and liquid state NMR spectroscopy. After graduating in 2018, she started her PhD on the project "Artificial metalloproteins for water oxidation" within the Leiden Institute of Chemistry under the supervision of Dr. Anjali Pandit, prof. Sylvestre Bonnet, and prof. Huub de Groot to design and characterize artificial metalloproteins with photosensitizer, hydrogen evolution, and water oxidation activity.

During her PhD, she presented her research in several national and international conferences:

- Reedijk Symposium 2018 & 2019, Leiden, The Netherlands (**Poster Presentation**)
- Dutch Biophysics 2018, 2019, & 2020, Veldhoven, The Netherlands (**Poster presentation**)
- 3rd International Solar Fuels Conference (ISF-3)/International Conference on Artificial Photosynthesis-2019 (ICARP2019) (Young and main conference), Hiroshima, Japan (**Poster presentation**)
- Chemistry As Innovative Science (NWO CHAINS) 2021 & 2022, Veldhoven, The Netherlands (**Oral presentation**)
- International Solar fuels conference (ISF) 2021 (Young and at the "best of young" section of the main conference), online (**Oral presentation**)

- 23rd The Netherlands' Catalysis and Chemistry Conference (NCCC XXIII) 2022, Leeuwenhorst, The Netherlands (**Poster presentation**)
- 28th PhotoIUPAC 2022, Amsterdam, The Netherlands (**Oral presentation**)
- Holland Research School of Molecular Chemistry (HRSMC)/ 6th European Photochemistry Association (EPA) Advanced Summer School on Photochemistry 2022, Noordwijk, The Netherlands (**Poster presentation**).
- Holland Research School of Molecular Chemistry (HRSMC) Symposium 2022, Amsterdam, The Netherlands (**Poster presentation**).

LIST OF PUBLICATIONS

Ganapathy, S., Opdam, L., Hontani, Y., Frehan, S., Chen, Q., Hellingwerf, K.J., de Groot, H.J., Kennis, J.T. and de Grip, W.J. (**2020**). Membrane matters: The impact of a nanodisc-bilayer or a detergent microenvironment on the properties of two eubacterial rhodopsins. Biochimica et Biophysica Acta (BBA)-Biomembranes, 1862(2), 183113.

Opdam, L. V., Polanco, E. A., de Regt, B., Lambertina, N., Bakker, C., Bonnet, S., & Pandit, A. (**2022**). A screening method for binding synthetic metallo-complexes to haem proteins. Analytical Biochemistry, 653, 114788.

Opdam, L. V and Polanco, E. A., Passerini, L., Huber, M., Bonnet, S., & Pandit, A. (**2024**). An artificial metalloenzyme that can oxidize water photocatalytically: design, synthesis, and characterization. Chemical Science. (accepted)

Polanco, E. A.; Opdam, L. V. Hakkennes, M.; Stringer, L.; Pandit, A.; Bonnet, S.A. An artificial carbonic anhydrase-ruthenium metalloenzyme for water oxidation (in revision)

Opdam, L; Götzfried, S; Polanco, E†; Bonnet, S and Pandit, A. Design and characterization of an artificial metalloenzyme-based dihydrogen evolution system. (Manuscript in preparation)

Opdam, L; Polanco, E†; Bonnet, S and Pandit, A. Electron transfer from a $Ru(bpy)_3$ derived photosensitizer to haem in four mutants of cytochrome b_5: The impact of the mutation site. (Manuscript in preparation)