

Curriculum Vitae – Dr. Jan M. Schuller

Personal details

Name	Schuller
First name	Jan Michael
Title	Dr. rer. nat.
Date of birth	31.03.1987
Nationality	German
Family status	married, two children (*2018, 2021)
Current Position	since July 2020 Emmy Noether Group Leader Philipps-Universität Marburg (UMR) Department of Chemistry, Karl-von-Frisch-Straße 6, 35042 Marburg
phone	+49-(0)-6421-28-22584
e-mail	jan.schuller@synmikro.uni-marburg.de
Main research fields	structural biology, bioenergetics, evolution, energy conservation, CO ₂ fixation, photosynthesis

1. Academic education and qualification

2012 - 2016	PhD/Dissertation, Chemistry (Dr. rer. nat), Technical University Munich
2010 - 2011	Visiting Researcher, Laboratory of Molecular Electron Microscopy, Harvard Medical School Center for Molecular and Cellular Dynamics Boston.
2006 - 2012	Diploma studies Biochemistry, Eberhard Karls University Tübingen

Professional career

since 2020	Emmy Noether Group Leader, UMR Department for Chemistry
2016 - 2020	PostDoc, Department of Structural Cell Biology, MPI for Biochemistry

2. Community Service

3. 3. Prizes, Honors and Community Service

2023	VAAM (German microbiological society) Research Award
2022	ERC Starting grant TWO-CO ₂ -One
2021	Heinz Maier-Leibnitz Price (DFG) – most prestigious junior scientist award of the German research society
2021	Daimler Benz Fellowship
2020	Board of Directors of SYNMIKRO, UMR
2020	Member of SYNMIKRO, UMR
2020	Member of IMPRS-MIC, MPI for terrestrial microbiology
2020	Emmy Noether grant (DFG), “Structural studies of the prokaryotic carbon concentration mechanism.
2017	Junior Scientist Publication Award, Max Planck Society

Publications

corresponding authors; * equal contribution;

- (1) Kumar A*, Kremp F*, Freibert SA, Müller V[#], **Schuller JM[#]** (2023) Molecular architecture and electron transfer pathways of the Stn family transhydrogenase. accepted, *Nature Commun.*
- (2) Winiarska A[#], Ramírez-Amador F*, Hege D, Gemmecker Y, Prinz S, Hochberg GKA, Heider J[#], Maciej Szaleniec M[#], **Schuller JM[#]** (2023) A bacterial tungsten-containing aldehyde oxidoreductase forms an enzymatic decorated protein nanowire. *Sci Adv.* 2023 Jun 2;9(22):eadg6689. doi: 10.1126/sciadv.adg6689.
- (3) Katsyv* A, Kumar A*, Saura P*, Pöverlein MC, Freibert SA, Stripp ST, Jain S, Gamiz-Hernandez AP, Kaila VRI[#], Müller VM[#], Schuller JM[#] (2023) Molecular basis of the electron bifurcation mechanism in the [FeFe]-hydrogenase complex HydABC. *J Am Chem Soc* 145: 5696–5709
- (4) Schulz L, Guo Z, Zarzycki J, Steinchen W, **Schuller JM**, Heimerl T, Prinz S, Mueller-Cajar O, Erb TJ[#], Hochberg GKA[#] (2022) Evolution of increased complexity and specificity at the dawn of Form I Rubiscos. *Science* 2022 Oct 14;378(6616):155-160.

- (5) Dietrich HM*, Righetto RD*, Kumar A, Wietrzynski W, Trischler R, Schuller SK, Wagner J, Schwarz FM, Engel BD#, Müller V#, **Schuller JM**# (2022) Membrane-anchored HDCR nanowires drive hydrogen-powered CO₂ fixation. *Nature Jul;607(7920):823-830*.
- (6) Kayastha K, Katsyv A, Himmrich C, Welsch S, **Schuller JM**, Ermler U#, Müller V# (2022) Structure-based electron-confurcation mechanism of the Ldh-EtfAB complex. *eLife Jun 24;11:e77095*
- (7) Gupta TK*, Klumpe S*, Gries K*, Heinz S*, Wietrzynski S, Ohnishi N, Niemeyer J, Schaffer M, Rast A, Strauss M, Plitzko JM, Baumeister W, Rudack T, Sakamoto W, Nickelsen J, **Schuller JM**#, Schroda M#, Engel BD# (2020) Structural basis for VIPP1 oligomerization and maintenance of thylakoid membrane integrity. *Cell Jul 8;184(14):3643-3659.e23*.
- (8) Zabret J*, Bohn S*, Schuller SK, Arnolds O, Möller M, Meier-Credo J, Liauw P, Chan A, Tajkhorshid E, Langer JD, Stoll R, Krieger-Liszkay A, Engel BD, Rudack T#, **Schuller JM**#, Nowaczyk MM# (2021) Structural insights into photosystem II assembly. *Nat Plants. Apr;7(4):524-538*.
- (9) Scheffen M, Marchal DG, Beneyton T, Schuller SK, Klose M, Diehl C, Lehmann J, Pfister P, Carrillo M, He H, Aslan S, Cortina NS, Claus P, Bollschweiler D, Baret JC, **Schuller JM**, Zarzycki J, Bar-Even A, Erb TJ (2021) A new-to-nature carboxylation module to improve natural and synthetic CO₂ fixation. *Nature Catalysis (4), 105–115*.
- (10) Schuller SK*, **Schuller JM***, Prabu JR, Baumgärtner M, Bonneau F, Basquin J, Conti E (2020) Structural insights into the nucleic acid remodeling mechanisms of the yeast THO-Sub2 complex. *eLife 16;9*.
- (11) **Schuller JM*** #, Saura P*, Thiemann J*, Schuller SK, Gamiz-Hernandez AP, Kurisu G, Nowaczyk MM#, Kaila VRI# (2020) Redox-coupled proton pumping drives carbon concentration in the photosynthetic complex I. *Nature Commun 11(1):494*.
- (12) Albert S, Wietrzynski W, Lee CW, Schaffer M, Beck F, **Schuller JM**, Salomé PA, Plitzko JM, Baumeister W, Engel BD (2019) Direct visualization of degradation microcompartments at the ER membrane. *Proc Natl Acad Sci U S A. Jan 14;117(2):1069-1080*.

- (13) Gat Y*, **Schuller JM***, Lingaraju M, Weyher E, Bonneau F, Strauss M, Murray PJ, Conti E (2019) InsP6 binding to PIKK kinases revealed by the cryo-EM structure of an SMG1-SMG8-SMG9 complex. *Nature Struct. Mol. Biol.* 26(12):1089-1093. 0342-7.
- (14) Schäfer IB, Yamashita M, **Schuller JM**, Schüssler S, Strauss M, Conti E. (2019) Cryo-EM structure of a poly(A) RNP bound to the Pan2-Pan3 deadenylase. *Cell.* 30;177(6):1619-1631.
- (15) **Schuller JM[#]**, Birrell JA, Tanaka H, Konuma T, Wulfhorst H, Cox N, Schuller SK, Thiemann J, Lubitz W, Sétif P, Ikegami T, Engel BD, Kurisu G[#], Nowaczyk MM[#] (2019) Structural adaptations of photosynthetic complex I enable ferredoxin-dependent electron transfer. *Science* 363(6424):257-260.
- (16) Gerlach P.* , **Schuller JM***, Bonneau F, Basquin J, Reichelt P, Falk S, Conti E (2018) Distinct and evolutionary conserved structural features of the human nuclear exosome complex. *Elife.* 26;7.
- (17) **Schuller JM***, Falk S*, Fromm L, Hurt E, Conti E (2018) Structure of the nuclear exosome captured on a maturing preribosome. *Science* 360(6385):219-222.
- (18) Fromm L, Falk S, Flemming D, **Schuller JM**, Thoms M, Conti E, Hurt E. (2017) Reconstitution of the complete pathway of ITS2 processing at the pre-ribosome. *Nature Commun.* Nov 27;8(1):1787.
- (19) Snijder J*, **Schuller JM***, Wiegard A, Lössl P, Schmelling N, Axmann IM, Plitzko JM, Förster F, Heck AJ. (2017) Structures of the cyanobacterial circadian oscillator frozen in a fully assembled state. *Science.* 355(6330):1181-1184.
- (20) **Schuller JM**, Beck F, Lössl P, Heck AJ, Förster F (2016) Conformational changes of the AAA+ ATPase p97 revisited. *FEBS Lett.* Mar;590(5):595-604.
- (21) Butryn A, **Schuller JM**, Stoehr G, Runge-Wollmann P, Förster F, Auble DT, Hopfner KP (2016) Structural basis for recognition and remodeling of the TBP:DNA:NC2 complex by Mot1. *eLife* 10;4.
- (22) Hite RK, Chiu PL, **Schuller JM**, Walz T. Effect of lipid head groups on double-layered two-dimensional crystals formed by aquaporin-0. *PLoS One.* 2015 Jan 30;10(1):e0117371.

- (23) Byrne RT*, **Schuller JM***, Unverdorben P, Förster F, Hopfner KP. Molecular architecture of the HerA-NurA DNA double-strand break resection complex. *FEBS Lett.* 2014 Dec 20;588(24):4637-44.
- (24) Chen Y, Pfeffer S, Hrabec T, **Schuller JM**, Förster F. Fast and accurate reference-free alignment of subtomograms. *J. Struct Biol.* 2013 Jun;182(3):235-45.
- (25) **Schuller JM***, Zocher G*, Liebhold M, Xie X, Stahl M, Li SM, Stehle T (2012) Structure and catalytic mechanism of a cyclic dipeptide prenyltransferase with broad substrate promiscuity. *J Mol Biol* 422(1):87-99.

Reviews:

- (26) Lingaraju M, **Schuller JM**, Falk S, Gerlach P, Bonneau F, Basquin J, Benda C, Conti E. (2020) To Process or to Decay: A Mechanistic View of the Nuclear RNA Exosome. *Cold Spring Harb Symp Quant Biol.*
- (27) Förster F, **Schuller JM**, Unverdorben P, Aufderheide A. (2014) Emerging mechanistic insights into AAA complexes regulating proteasomal degradation. *Biomolecules.* 2014 Aug 6;4(3):774-94.