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## Qualifikationen

Habilitation, Biochemische Untersuchungen zur Silikatbiogenese bei Diatomeen, Universität Regensburg  
Datum der Bewilligung: 31 Dez. 2001

Biochemie, Promotion, Proteine der Diatomeenzellwand: Primärstrukturen, Eigenschaften und mögliche Rolle bei der Zellwandbiogenese, Universität Regensburg  
Datum der Bewilligung: 31 Dez. 1995

Chemie, Diplom, Universität Regensburg  
Datum der Bewilligung: 31 Dez. 1991

## Organisationszugehörigkeiten

### Wissenschaftliches Personal

Professur für Biomimetische Materialien  
Technische Universität Dresden  
1 Jan. 2013 → present

### Mitglied

Exzellenzcluster PoL: Physik des Lebens  
Technische Universität Dresden  
1 Nov. 2018 → present

### Wissenschaftliches Personal

Fakultät Chemie u. Lebensmittelchemie  
Technische Universität Dresden  
1 Jan. 2013 → present

### Professor:in

Georgia Institute of Technology  
Atlanta, USA/Vereinigte Staaten  
1 Jan. 2011 → 1 Jan. 2012

### Juniorprofessor:in

Georgia Institute of Technology  
Atlanta, USA/Vereinigte Staaten  
1 Jan. 2005 → 1 Jan. 2011

### Forschungsgruppenleiter:in

Universität Regensburg  
Regensburg, Deutschland  
1 Jan. 2001 → 1 Jan. 2004

### PostDoc

University of Melbourne  
Parkville, Australien  
1 Feb. 1998 → 1 Aug. 1998

## **PostDoc**

Universität Regensburg  
Regensburg, Deutschland  
1 Jan. 1996 → 1 Jan. 2001

## **Publikationen**

### **Diatom adhesive trail proteins acquired by horizontal gene transfer from bacteria serve as primers for marine biofilm formation**

Zackova Suchanova, J., Bilcke, G., Romanowska, B., Fatlawi, A., Pippel, M., Skeffington, A., Schroeder, M., & 4 weitere Vyverman, W., Vandepoele, K., Kröger, N. & Poulsen, N., Okt. 2023, in: *New Phytologist*. 240, 2, S. 770-783 14 S.

### **Thalassiosira pseudonana(Cyclotella nana) (Hustedt) Hasle et Heimdal (Bacillariophyceae): A genetically tractable model organism for studying diatom biology, including biological silica formation**

Poulsen, N. & Kroeger, N., Okt. 2023, in: *Journal of Phycology*. 59, 5, 9 S.

### **The molecular basis for pore pattern morphogenesis in diatom silica**

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### **On the role of cell surface associated, mucin-like glycoproteins in the pennate diatom *Craspedostauros australis* (Bacillariophyceae)**

Poulsen, N., Hennig, H., Geyer, V. F., Diez, S., Wetherbee, R., Fitz-Gibbon, S., Pellegrini, M., & 1 weitere Kröger, N., 5 Okt. 2022, in: *Journal of Phycology*. 2022, 16 S.

### **Shedding light on silica biomineralization by comparative analysis of the silica-associated proteomes from three diatom species**

Skeffington, A. W., Gentzel, M., Ohara, A., Milentyev, A., Heintze, C., Boettcher, L., Goerlich, S., & 3 weitere Shevchenko, A., Poulsen, N. & Kroeger, N., Juni 2022, in: *The plant journal*. 110, 6, S. 1700-1716 17 S.

### **Biomolecules Involved in Frustule Biogenesis and Function**

Kröger, N., 2022, *The Molecular Life of Diatoms*. Springer, Cham, S. 313-343 31 S.

### **Structure and Morphogenesis of the Frustule**

Babenko, I., Friedrich, B. & Kröger, N., 2022, *The Molecular Life of Diatoms*. Falciatore, A. & Mock, T. (Hrsg.). Springer, Cham, S. 287-312 26 S.

### **The role of organic matrices in biomineralization**

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### **Computational analysis of the effects of nitrogen source and sin1 knockout on biosilica morphology in the model diatom Thalassiosira pseudonana**

Horvát, S., Valiya Thodiyil, A. F., Görlich, S., Modes, C. D., Schlierf, M. & Kröger, N., 1 März 2021, in: *Discover Materials*. 1, 8.

### **Genetically Programmed Regioselective Immobilization of Enzymes in Biosilica Microparticles**

Kumari, E., Görlich, S., Poulsen, N. & Kröger, N., 18 Juni 2020, in: *Advanced functional materials*. 30, 25, 13 S., 2000442.

### **An intimate view into the silica deposition vesicles of diatoms**

Heintze, C., Formanek, P., Pohl, D., Hauptstein, J., Rellinghaus, B. & Kröger, N., 2020, in: *BMC materials*. 2, 1, S. 1-15 15 S.

### **Chitin synthase localization in the diatom Thalassiosira pseudonana**

Poulsen, N., Wustmann, M., Kröger, N. & Pée, K-H., 2020, in: *BMC materials*. 2, 10.

**Identification of proteins in the adhesive trails of the diatom *Amphora coffeaeformis***

Lachnit, M., Buhmann, M. T., Klemm, J., Kroeger, N. & Poulsen, N., 9 Sept. 2019, in: Philosophical Transactions of the Royal Society B: Biological Sciences. 374, 1784, 9 S., 20190196.

**Control of biosilica morphology and mechanical performance by the conserved diatom gene Silicanin-1**

Görlich, S., Pawolski, D., Zlotnikov, I. & Kroeger, N., 28 Juni 2019, in: Communications biology. 2, 8 S., 245.

**Influence of silica architecture on the catalytic activity of immobilized glucose oxidase**

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Pawolski, D., Heintze, C., Mey, I., Steinem, C. & Kroeger, N., Okt. 2018, in: Journal of Structural Biology. 204, 1, S. 64-74 11 S.

**Immobilization of Proteins on Diatom Biosilica**

Kröger, N., Dubey, N. C. & Kumari, E., 2017, *Diatom Nanotechnology : Progress and Emerging Applications*. Losic, D. (Hrsg.). 44 Aufl. Royal Society of Chemistry, S. 126-149 24 S. (RSC Nanoscience and Nanotechnology).

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**Establishing super-resolution imaging for proteins in diatom biosilica**

Groger, P., Poulsen, N., Klemm, J., Kroger, N. & Schlierf, M., 9 Nov. 2016, in: Scientific reports. 6, 8 S., 36824.

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De Sanctis, S., Wenzler, M., Kröger, N., Malloni, WM. M., Sumper, M., Deutzmann, R., Zadravec, P., & 3 weitereBrunner, E., Kremer, W. & Kalbitzer, HR. R., 6 Juli 2016, in: Structure. 24, 7, S. 1178-1191 14 S.

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**Targeted drug delivery using genetically engineered diatom biosilica**

Delalat, B., Sheppard, V. C., Rasi Ghaemi, S., Rao, S., Prestidge, C. A., McPhee, G., Rogers, M-L., & 5 weitere Donoghue, J. F., Pillay, V., Johns, T. G., Kröger, N. & Voelcker, N. H., 10 Nov. 2015, in: Nature communications. 6, 8791.

**Compartmentalisation of Enzymes for Cascade Reactions through Biomimetic Layer-by-Layer Mineralization**

Begum, G., Kröger, N., Goodwin, W. B., deGlee, B. M. & Sandhage, K. H., 2015, in: Journal of Materials Chemistry. B, Materials for biology and medicine. 2015, 26, S. 5232-5240 9 S.

**Complex-shaped microbial biominerals for nanotechnology**

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**Isolation and biochemical characterization of underwater adhesives from diatoms**

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Kröger, N., 2013, in: Biospektrum. 01/2013, S. 12-15 4 S.

**Live Diatom Silica Immobilization of Multimeric and Redox-Active Enzymes**

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**Biocatalytic Nanoscale Coatings Through Biomimetic Layer-by-Layer Mineralization**

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**From Diatom Biomolecules to Bioinspired Syntheses of Silica- and Titania-Based Materials**

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**Characterization of an Endoplasmic Reticulum-associated Silaffin Kinase from the Diatom *Thalassiosira pseudonana***

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**Protein-Mediated Layer-by-Layer Syntheses of Freestanding Microscale Titania Structures with Biologically Assembled 3-D Morphologies**

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**Protein-Enabled Synthesis of Monodisperse Titania Nanoparticles On and Within Polyelectrolyte Matrices**

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**Biochemistry and Molecular Genetics of Silica Biomineralization in Diatoms**

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**Diatoms—From Cell Wall Biogenesis to Nanotechnology**

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**Identification of peptides capable of inducing the formation of titania but not silica via a subtractive bacteriophage display approach**

Fang, Y., Poulsen, N., Dickerson, M. B., Cai, Y., Jones, S. E., Naik, R. R., Kröger, N., & 1 weitere Sandhage, K. H., 2008, in: *Journal of materials chemistry*. 18, 32, S. 3871-3875 5 S.

**Prescribing diatom morphology: toward genetic engineering of biological nanomaterials**

Kroeger, N., Dez. 2007, in: *Current opinion in chemical biology*. 11, 6, S. 662-669

**Silica Immobilization of an Enzyme through Genetic Engineering of the Diatom *Thalassiosira pseudonana***

Poulsen, N., Berne, C., Spain, J. & Kröger, N., 2007, in: *Angewandte Chemie - International Edition*. 119, 11, S. 1875-1878 4 S.

**Rapid, room-temperature formation of crystalline calcium molybdate phosphor microparticles via peptide-induced precipitation**

Ahmad, G., Dickerson, M. B., Church, B. C., Cai, Y., Jones, S. E., Naik, R. R., King, J. S., & 3 weitere Summers, C. J., Kröger, N. & Sandhage, K. H., 4 Juli 2006, in: *Advanced materials*. 18, 13, S. 1759-1763 5 S.

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**MOLECULAR GENETIC MANIPULATION OF THE DIATOM *THALASSIOSIRA PSEUDONANA* (BACILLARIOPHYCEAE)**

Poulsen, N., Chesley, P. & Kröger, N., 2006, in: *Journal of Phycology*. 42, 5, S. 1059-1065 7 S.

**The Molecular Basis of Diatom Biosilica Formation**

Kröger, N. & Sumper, M., 22 Juli 2005, *Biomineralization: Progress in Biology, Molecular Biology and Application*. Wiley-Blackwell, Oxford [u. a.], S. 137-158 22 S.

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Poulsen, N. & Kröger, N., Juli 2005, in: FEBS Journal. 272, 13, S. 3413-3423 11 S.

**Biosilica nanofabrication in diatoms: The structures and properties of regulatory silaffins**

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**Silica formation in diatoms: The function of long-chain polyamines and silaffins**

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Bertermann, R., Kröger, N. & Tacke, R., März 2003, in: Analytical and Bioanalytical Chemistry. 375, 5, S. 630-634 5 S.

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**Die Biogenese der Silikat-Zellwände von Diatomeen**

Kröger, N., 2001, Biospektrum, S. 556-557.

**$^1\text{H}$ ,  $^{13}\text{C}$  and  $^{15}\text{N}$  sequence-specific resonance assignment of the PSCD4 domain of diatom cell wall protein pleuralin-1 [6]**  
Wenzler, M., Brunner, E., Kröger, N., Lehmann, G., Sumper, M. & Kalbitzer, H. R., 2001, in: Journal of biomolecular NMR. 20, 2, S. 191-192 2 S.

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**Species-specific polyamines from diatoms control silica morphology**

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