Block, Stephan, Dr.
Head of the Emmy Noether Junior Research Group „Bionanointerfaces“

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Date of birth: July 12, 1978 (in Brandenburg an der Havel)
married, 2 children (born 2011 and 2019)

Educational Background

08/2005-12/2010 Doctorate (**Dr. rer. nat.**, **Applied Physics**, grade: *summa cum laude*) at the University of Greifswald (Germany) in the lab of Prof. Dr. C. A. Helm („Soft Matter and Biophysics“)

10/1999-07/2005 **Diploma** in Physics (**Applied Physics**, grade: *excellent*) at the University of Greifswald (Germany) in the lab of Prof. Dr. U. Lübbert („Sensors and Signal Processing“)

Work Experience and Research Projects

Since 03/2016 **Independent Junior Group Leader**: Department of Chemistry and Biochemistry, *Freie Universität Berlin (FUB)*, Berlin, Germany

- Development of novel mobility analyses to quantify multivalent (virus-membrane) interactions and their modification (*e.g.* by addition of binding inhibitors)
- Development of a novel force spectroscopy platform using hydrodynamic forces, probing >2000 single interactions in parallel with sub-pN and sub-nm resolution
- Quantification of the catalytic activity of single enzymes
- **Since 11/2017**: funded by the **DFG's Emmy Noether Programme**

08/2013-02/2016 **PostDoc** with Prof. Dr. F. Höök („Biological Physics“), Department of Physics, *Chalmers University of Technology*, Göteborg, Sweden

- Pioneering works on the application of mobility analyses to quantify (*i*) the valency of multivalent interactions and (*ii*) hydrodynamic forces acting on bilayer-linked particles
- Probing diffusion of single lipids and single lipid-lipid complexes in bilayers with nm (spatial) and µs (temporal) resolution by combining fluorescence correlation spectroscopy, nanoplasmonics, and autocorrelative burst analysis

09/2011-07/2013 **PostDoc** with Prof. Dr. M. Delcea („Nanostructure Group“), ZIK HIKE, *University Medicine Greifswald*, Germany

- Biophysical and biochemical characterization of proteins, protein complexes, and cells to study the molecular fundamentals of autoimmune diseases (AFM, ITC, CD spectroscopy etc.)
- Development of *in vitro* assays to predict the antigenic potential of polymers

07/2010-08/2011 **Independent Project Leader**: associated to the lab of Prof. Dr. C. A. Helm („Soft Matter and Biophysics“), Institute of Physics, *University of Greifswald*, Germany

- Development of a novel AFM approach to quantify magnetic properties of single superparamagnetic nanoparticles at the nm-scale

08/2005-06/2010 **Research Assistant** with Prof. Dr. C. A. Helm („Soft Matter and Biophysics“), Institute of Physics, *University of Greifswald*, Germany

- Development of AFM approaches to determine the conformation of physisorbed polyelectrolytes based on measurements of surface forces

Third-party Funding and Awards

2021 – 2025	**PI** within the international **RTG 2662** (B1: 251,300 €)
2021 – 2024	**PI** within the **CRC 1449** (A3: 233,600 €, B3: 233,600 €, IRTG: 635,600 €)
2021 – 2024	**PI** within the **CRC 1078** (A6: 221,600 €)
2018 – 2020	**PI** within the **CRC 1078** (A6: 158,300 €)
Since 2017	**Emmy Noether Programme** of the German Research Foundation (1.5 M€)
2016 – 2019	**Junior Research Group Leader** within the **CRC 765** (80,000 €)
2011	**Dissertation Award 2011** of the University of Greifswald
2010	**1st price** of the idea competition VentureCup-MV 2010, category "young scientist" (130,000 € project funding provided by the European Social Fund)
2009	**3rd price** of the idea competition of the University of Greifswald

Memberships, Professional Service, and Commissions of Trust

- Memberships
  - **Member** of the CRC 765 (associated junior research group; 2016 - 2019), CRC 1078 (**PI**; since 2017), CRC 1449 (**PI**; since 2021), international GRK 2662 (**PI**; since 2021)
  - **Spokesperson** of the Integrated Research Training Group and **Member of the Executive Committee** of the CRC 1449 (since 2021)
  - **Spokesperson** of the Junior Research Groups of the CRC 1449 and within the research building SupraFAB (since 2021)
  - **Member** of the Collaboration Platform of the Berlin University Alliance (since 2021)
  - **Member** of the German Physical Society (DPG; since 1999), the German Biophysical Society (DGfB; since 2018), and the Gesellschaft Deutscher Chemiker (GDCh; since 2019)
- Ad Hoc **Referee** for peer-reviewed journals (> 100 reviews since 2010) including *Advanced Materials, ACS Nano, Angewandte Chemie: International Edition, Biophysical Journal, Chemical Reviews, Clinical and Translational Medicine, Europhysics Letters, Clinical and Applied Thrombosis/Hemostasis, Colloids and Surfaces B: Biointerfaces, Journal of Physical Chemistry, Journal of Physics D, Langmuir, JoVE, Macromolecules, Nano Letters, Nanomaterials, Nature Medicine, Scientific Reports, Small, Soft Matter, Surface Review and Letters, Ultramicroscopy*
- Ad Hoc **Referee** for major national research councils including the German Research Foundation (DFG), Austrian Science Fund (Austria), the BBSRC (UK), etc.
- Service on **examination committees** of 3 international PhD defenses (Damiano Verardo, *Lund University, Sweden*; Sabina Deutschmann, *Bern University; Switzerland;* Erik Hamming, *University of Twente, The Netherlands*) and 9 doctoral defenses at the *Freie Universität Berlin* (Christian Halbig, Jia Hui Li, Nadine Rades, Qidi Ran, Zhaoxu Tu, Leonhard Urner, Karolina Walker, Matthias Wallert, Stephanie Zimmermann); member of a doctoral thesis **advisory committee** (Muktesh Athale, *Tampere University*, Finland)
- **Co-organizer** of the conference "*Summer School on Microfluidics*" (Oct 2020, FU Berlin), the "*International Seminar on Dynamic Hydrogels*" (Oct 2022, FU Berlin) and the "*Bionano 2022*" workshop on protein nanoscience (Fall 2022, FU Berlin); **Organizer** of the colloquium of the CRC 1449 (since 2021)

Supervision

- Supervision of **postdoctoral research associates** at the *Freie Universität Berlin*:
  Katharina Gloria Hugentobler (2019 - 2022; biochemistry), *Stephanie Wedepohl* (since 2020; biology), *Valentin Reiter Scherer* (2020 - 2021; biophysics; now at PicoQuant, Berlin)
- Supervision of **doctoral** students at the *Freie Universität Berlin*:
  Matthias Wallert (2017 - 2020; macromolecular chemistry; now at W. Pelz GmbH & Co. KG, Wahlstedt), *Yannic Kerkhoff* (since 2019; biochemistry; thesis submission planned for 31.10.2022), *Kevin Diestelhorst* (since 2021, physical chemistry)
- Supervision of **Master** level students at the *Freie Universität Berlin*:
  Johann Plaschke (2021 - 2022; chemistry), *Jose Antonio Flores Gutierrez* (since 2021; biophysics), *Andrea Lörinczi* (since 2022; biophysics)
- Supervision of **Bachelor** level students at the *Freie Universität Berlin*:
  Lisa Glinzig (2018; biochemistry; now at GlaxoSmithKline, Berlin), Helen Wildenauer (2019; biochemistry; now at BlueSense Diagnostics, Copenhagen)
- Co-supervision of **doctoral** students at *Chalmers University of Technology*:
  Björn Johansson Fast (2014 – 2016)
- Co-supervision of **doctoral** students at the *University of Greifswald*:
  Florian Berg (2010 – 2015; applied physics), *Frank Lawrenz* (2010 – 2016; applied physics), *Sven Brandt* (2011 – 2012; biophysics), *Michael Glaubitz* (2011 – 2012; biophysics)
- Co-supervision of **diploma** students at the *University of Greifswald*:
  Matthias Cornelsen (2009 – 2010; applied physics), *Peter Nestler* (2009 – 2010; applied physics)

Teaching

Winter 2021	lecture + seminar on **Soft Matter Physics** at the *Freie Universität Berlin* (2 + 1 hours per week per semester)
Summer 2021	lecture **Advanced Biophysics** at the *Freie Universität Berlin* (shared with Prof. J. Heberle; own contribution: 2 hours per week per semester)
Winter 2020	lecture + seminar on **Soft Matter Physics** at the *Freie Universität Berlin* (2 + 1 hours per week per semester)
Summer 2020	lecture **Advanced Biophysics** at the *Freie Universität Berlin* (shared with Prof. J. Heberle; own contribution: 2 hours per week per semester)
Winter 2019	lecture **Physics for Natural Scientist** at the *Freie Universität Berlin* (shared with Dr. A. Setaro; own contribution: 2 hours per week per semester)
Winter 2018	lecture **Biophysics for Bachelor** at the *Freie Universität Berlin* (4 hours per week per semester)
Summer 2018	lecture **Advanced Biophysics** at the *Freie Universität Berlin* (shared with Prof. J. Heberle; own contribution: 1 hours per week per semester)
Winter 2017	lecture **Biophysics for Bachelor** at the *Freie Universität Berlin* (shared with Prof. J. Heberle; own contribution: 2 hours per week per semester)
Winter 2014 + Winter 2015	Support of the lecture **Biophysics** at *Chalmers University of Technology*
Winter 2005 – Summer 2009	**Teaching Assistant** for courses on **experimental physics** at the *University of Greifswald* (8 semesters in total with 2 hours per week per semester)

List of Publications

Summary (as of 11.11.2022):

- Google Scholar: 1756 citations, h-index 23; Web of Science: 1231 citations, h-index: 20
- 53 articles, 2 reviews; 2 book chapters, 1 book; 2 patents; >50 posters, >50 talks (> 25 invited)
- 22x (co-)corresponding author, 13x first and 1x shared first authorship

List of Publications (* marks corresponding author(s), # marks equal contribution)

Research Articles (* marks corresponding authors, # marks equal contribution)

53. Kerkhoff Y*, Nie C, Wedepohl S, Ahmadi V, Haag R, **Block S***. A fast open-source Fiji-macro to quantify virus infection and transfection on single-cell level by fluorescence microscopy. *MethodX* **9**, 101834 (2022).

52. Ahmadi V*, Nie C, Mohammadifar E, Achazi K, Wedepohl S, Kerkhoff Y, **Block S**, Osterrieder K, Haag R*. One-pot gram-scale synthesis of virucidal heparin-mimicking polymers as HSV1 inhibitors. *Accepted, Chemical Communications* (2021).

51. Lindner M, Laporte A, **Block S**, Elomaa K, Weinhart M*. Physiological Shear Stress Enhances Differentiation, Mucus-Formation and Structural 3D Organization of Intestinal Epithelial Cells In Vitro. *Cells* **10**, 2062 (2021).

50. Bhatia S, Donskyi IS, **Block S**, Nie C, Burdinski A, Lauster D, Radnik J, Herrmann A, Haag R*, Ludwig K*, Adeli M*. Wrapping and Blocking of Influenza A Viruses by Sialylated 2D Nanoplatforms. *Adv. Mater. Interfaces* **8**, 2100285 (2021).

49. Nie C*, Pouyan P, Lauster D, Trimpert J, Kerkhoff Y, Szekeres GP*, Wallert M, **Block S**, Sahoo AK*, Dernedde J, Pagel K, Kaufer BB, Netz RR, Ballauff M, Haag R*, Polysulfates block SARS-CoV-2 uptake through electrostatic interactions. *Angewandte Chemie IE* **60**, 15870-15878 (2021).

48. Wallert M, Plaschke J, Dimde M, Ahmadi V, **Block S***, Haag R*. Automated solvent-free polymerization of hyperbranched polyglycerol with tailored molecular weight by online torque detection. *Macromolecular Materials and Engineering* **7**, 2000688 (2021).

47. Wolde-Kidan A, Herrmann A, Prause A, Gradzielski M, Haag R, **Block S**, Netz R*. Particle Diffusivity and Free-Energy Profiles in Hydrogels from Time-Resolved Penetration Data. *Biophysical Journal* **120**, 463-475 (2021).

46. Nie C, Stadtmüller M, Prashad B, Wallert M, Ahmadi V, Kerkhoff Y, Bhatia S, **Block S***, Cheng C*, Wolff T*, Haag R*. Heteromultivalent topology-matched nanostructures as potent and broad-spectrum influenza A virus inhibitors. *Science Advances* **7**, eabd3803 (2021).

45. Wallert M, Nie C, Anilkumar P, Abbina S, Bhatia S, Ludwig K, Kizhakkedathu JN, Haag R*, **Block S***. Mucin-inspired, high molecular weight virus binding inhibitors show biphasic binding behavior to influenza A viruses. *Small* **16***,* 2004635 *(*2020*).*

44. Hugentobler KG, Heinrich D, Berg J, Heberle J, Brzezinski P, Schlesinger R, **Block S***. Lipid Composition Affects the Efficiency in the Functional Reconstitution of the Cytochrome c Oxidase. *International Journal of Molecular Sciences* **21**, 6981 (2020).

43. Li JH, Santos-Otte P, Au B, Rentsch J, **Block S**, Ewers H*. Directed manipulation of membrane proteins by fluorescent magnetic nanoparticles. *Nature Communications* **11**, 4259 (2020).

42. Jõemetsa S, Joyce P, Lubart Q, Mapar M, Celauro E, Agnarsson B, **Block S**, Bally M, Winters EE, Jeffriese GDM, Höök F*. Independent size and fluorescence emission determination of individual biological nanoparticles reveals that lipophilic dyes do not scale with particle size. *Langmuir* **36**, 9693-9700 (2020).

41. Bhatia S*, Hilsch M, Cuellar Camacho JL, Ludwig K*, Nie C, Parshad B, Wallert M, **Block S**, Lauster D, Böttcher C, Herrmann A, Haag R*. Adaptive flexible sialylated nanogels as highly potent influenza A virus inhibitors. *Angewandte Chemie IE* **59**, 12417-12422 (2020).

40. Kerkhoff Y, **Block S*.** Analysis and refinement of 2D single-particle tracking experiments (Invited tutorial). *Biointerphases* **15**, 021201 (2020).

39. Parveen N*, Rydell GE, Larson G, Hytönen VP, Zhdanov VP, Höök F*, **Block S***. Competition for membrane receptors: norovirus detachment via lectin attachment. *JACS* **141***,* 16303-16311 (2019).

38. Müller M, Lauster D, Wildenauer HHK, Herrmann A, **Block S***. Mobility-based quantification of multivalent virus-receptor interactions: New insights into influenza A virus binding mode. *Nano Letters* **19**, 1875-1882 (2019).

37. Rupert DLM, Mapar M, Shelke GV, Norlin K, Elmeskog M, Lötvall JO, **Block S**, Bally M, Agnarsson B, Höök F*. Optical density and lipid content of extracellular vesicles revealed using optical waveguide scattering and fluorescence microscopy. *Langmuir* **34**, 8522-8531 (2018).

36. Runde S, Ahrens H, Lawrenz F, Sebastian A, **Block S**, Helm CA*. Stable 2D conductive Ga/Ga(OxHy) multilayers with controlled nanoscale thickness prepared from gallium droplets with oxide skin. *Advanced Materials Interfaces* **5**, 1800323 (2018).

35. Peerboom N[#], Schmidt E[#], Trybal E, **Block S**, Bergström T, Pace H, Bally M*. A cell membrane derived platform to study virus binding kinetics with single particle sensitivity. *ACS Infectious Diseases* **4**, 944-953 (2018).

34. Parveen N, Rimkute I, **Block S**, Rydell G, Midtvedt D, Larsson G, Hytönen V, Zhdanov VP, Lundgren A, Höök F*. Membrane deformation induces clustering of norovirus bound to glycol-sphingolipids in a supported cell-membrane mimic. *Journal of Physical Chemistry Letters* **9**, 2278-2284 (2018).

33. **Block S***, Acimovic SS, Länk NO, Käll M*, Höök F*. Antenna-enhanced fluorescence correlation spectroscopy resolves calcium-mediated lipid-lipid-interactions. *ACS Nano* **12**, 3272-3279 (2018).

32. Lundgren AO[#], Johansson Fast B[#], **Block S**, Agnarsson B, Reimhult E, Gunnarsson A, Höök F*. Affinity purification of membrane proteins in native supported membranes. *Nano Letters* **18**, 381-385 (2018).

31. Jumeaux C, Wahlsten O, **Block S,** Kim E, Chandrawati R, Howes PD, Höök F*, Stevens MM*. MicroRNA Detection by DNA-Mediated Liposome Fusion Using a 3D Single Vesicle Tracking FRET Assay. *ChemBioChem* **19**, 434-438 (2018).

30. Peerboom N, **Block S**, Altgärde N, Wahlsten O, Schnabelrauch M, Bergström T, Bally M*. Binding kinetics and lateral mobility of herpes simplex virus type 1 on end-grafted sulfated glycosaminoglycans. *Biophysical Journal* **113***,* 1223-1234 (2017).

29. Parveen N, **Block S,** Zhdanov VP, Rydell G, Höök F*. Release and Inhibition of Virus by Competitive Protein. *Langmuir* **33***,* 4049-4056 (2017).

28. Friedrich R, **Block S**, Alizadehheidari M, Heider S, Fritzsche J, Esbjörner E, Westerlund F*, Bally M*. A nano flow cytometer for single lipid vesicle analysis. *Lab on a Chip* **17**, 830-841 (2017).

27. Berg J[#], **Block S**[#], Höök F, Brzezinski P*. Single proteoliposomes with E. coli quinol oxidase: proton pumping without transmembrane leaks. *Israel Journal of Chemistry* **57**, 437-445 (2017).

26. Rupert DLM, Shelke GV, Emilsson G, Claudio V, **Block S**, Lässer C, Dahlin A, Lötvall JO, Bally M, Zhdanov VP, Höök F*. Dual-wavelength surface plasmon resonance for determining the size and concentration of sub-populations of extracellular vesicles. *Analytical Chemistry* **88***,* 9980-9988 (2016).

25. Tabaei SR, Gillissen JJJ, **Block S**, Höök F, Cho N-J*. Hydrodynamic propulsion of liposomes electrostatically attracted to a lipid membrane reveals size-dependent conformational changes. *ACS Nano* **10**, 8812-8820 (2016).

24. **Block S***, Johansson Fast B, Lundgren A, Zhdanov VP, Höök F*. Two-dimensional flow nanometry of biological nanoparticles for accurate determination of their size and emission intensity. *Nature Communications* **7**, 12956 (2016).

23. **Block S***, Zhdanov VP, Höök F*. Quantification of multivalent interactions by tracking single biological nanoparticle mobility on a lipid membrane. *Nano Letters* **16***,* 4382-4390 (2016).

22. Lawrenz F, Lange P, Severin N, Rabe JP*, Helm CA*, **Block S***. Morphology, mechanical stability and protective properties of ultrathin gallium oxide coatings. *Langmuir* **31**, 5836-5842 (2015).

21. Petkovic S, Badelt S, **Block S***, Flamm C, Delcea M, Hofacker I*, Müller S*. Sequence-controlled RNA self-processing: computational design, biochemical analysis and visualization by AFM. *RNA* **21**, 1-12 (2015).

20. Berg F, Wilken J, Helm CA*, **Block S***. Quantification of radical-induced DNA damage using AFM imaging. *J. Phys. Chem. B* **119**, 25-32 (2015).

19. Kreimann M, Brandt S, Krauel K, **Block S**, Helm CA, Weitschies W, Greinacher A*, Delcea M*. Binding of anti-platelet factor 4/heparin antibodies depends on the thermodynamics of conformational changes in platelet factor 4. *Blood* **124**, 2442-2449 (2014).

18. Glaubitz M, **Block S***, Witte J, Empen K, Gross S, Schlicht R, Weitmann K, Klingel K, Kandolf R, Hoffmann W, Gottschalk KE, Busch M, Dörr M, Helm CA, Felix SB, Riad A*. Stiffness of left ventricular cardiac fibroblasts contributes to ventricular dilation in patients with recent-onset non-ischemic and non-valvular cardiomyopathy. *Circulation Journal* **78**, 1693-1700 (2014).

17. Rupert DLM, Lässer C, Eldh M, **Block S**, Zhdanov VP, Lotvall J, Bally M, Höök F*. Determination of exosome concentration in solution using surface plasmon resonance spectroscopy. *Analytical Chemistry* **86**, 5929-5936 (2014).

16. Brandt S, Krauel K, Gottschalk KE, Renné T, Helm CA, Greinacher A*, **Block S***. Characterization of the conformational changes in platelet factor 4 induced by polyanions: towards *in-vitro* prediction of antigenicity. *Thrombosis and Haemostasis* **112**, 53-64 (2014).

15. **Block S***, Greinacher A, Helm CA, Delcea M*. Characterizing bonds formed between platelet factor 4 and negatively charged drugs using single molecule force spectroscopy. *Soft Matter* **10**, 2775-2784 (2014).

14. Jaax ME, Krauel K, Marschall T, Brandt S, Gansler J, Fürll B, Appel B, Fischer S, **Block S**, Helm CA, Müller S, Preissner KT, Greinacher A*. Complex formation with nucleic acids and aptamers alters antigenic properties of platelet factor 4. *Blood* **122**, 272-281 (2013).

13. Berg F, **Block S**, Drache S, Hippler R, Helm CA*. The effects of reactive oxygen species on single polycation layers". *J. Phys. Chem. B* **117**, 8475-8483 (2013).

12. Nestler P, **Block S***, Helm CA*. „Temperature-induced transition from odd-even to even-odd effect in polyelectrolyte multilayers due to interpolyelectrolyte interactions. *J. Phys. Chem. B* **116**, 1234-1243 (2012).

11. **Block S***, Glöckl G, Weitschies W, Helm CA. Direct visualization and identification of biofunctionalized nanoparticles using a magnetic atomic force microscope. *Nano Letters* **11***,* 3587-3592 (2011).

10. **Block S***, Helm CA. Equilibrium and non-equilibrium features in the morphology and structure of physisorbed polyelectrolyte layers. *J. Phys. Chem. B* **205***,* 7301-7313 (2011).

9. Straňák V*, **Block S**, Drache S, Hubička Z, Helm CA, Jastrabík L, Tichý M, Hippler R. Size-controlled formation of Cu nanoclusters in pulsed magnetron sputtering system. *Surface and Coatings Technology*, **205** 2755-2762 (2011).

8. Ortinau S, Schmich J, **Block S**, Liedmann A, Jonas L, Weiss DG, Helm CA, Rolfs A, Frech MJ*. Effect of 3D-scaffold formation on differentiation and survival in human neural progenitor cells. *BioMedical Engineering OnLine* **9**, 70 (2010).

7. Cornelsen M, Helm CA*, **Block S**. Destabilization of polyelectrolyte multilayers formed at different temperatures and ion concentrations. *Macromolecules* **43**, 4300-4309 (2010).

6. **Block S**, Helm CA*. Single polyelectrolyte layers adsorbed at high salt concentrations: polyelectrolyte brush domains coexisting with flatly adsorbed chains. *Macromolecules* **42**, 6733-6740 (2009).

5. Straňák V*, Čada M, Quaas M, **Block S**, Bogdanowicz R, Kment Š, Wulff H, Hubička Z, Helm CA, Tichý M, Hippler R. Physical properties of homogeneous TiO_2 films prepared by high power impulse magnetron sputtering as a function of crystallographic phase and nanostructure. *J. Phys. D: Appl. Phys.* **42**, 105204 (2009).

4. Agmo Hernandez V, Niessen J, Harnisch F, **Block S**, Greinacher A, Kroemer HK, Helm CA, Scholz F*. The adhesion and spreading of thrombocyte vesicles on electrode surfaces. *Bioelectrochemistry* **74**, 210-216 (2008).

3. **Block S**, Helm CA*. Conformation of poly(styrene sulfonate) layers physisorbed from high salt solution studied by force measurements on two different length scales. *J. Phys. Chem. B* **112**, 9318-9327 (2008). One image of this publication was reused in the book “Surface and Interfacial Forces” of Hans-Jürgen Butt and Michael Kappl.

2. **Block S**, Helm CA*. Measurement of long-ranged steric forces between polyelectrolyte layers physisorbed from 1 M NaCl. *Phys. Rev. E.* **76**, 030801 (2007).

1. **Block S**, Gamet E, Pigeon F*. Semiconductor laser with external resonant grating mirror. *IEEE Journal of Quantum Electronics* **41**, 1049-1053 (2005).

Reviews, Books, and Book Chapters (* marks corresponding author)

5. Bally M, **Block S**, Höök F*, Larson G*, Parveen N, Rydell R. Physicochemical tools for studying virus interactions with targeted cell membranes in a molecular and spatiotemporally resolved context. *Analytical Bioanalytical Chemistry* **413**, 7157-7178 (2021). (*Review*)

4. **Block S***. Brownian motion at lipid membranes: A comparison of hydrodynamic models describing and experiments quantifying diffusion within lipid bilayers. *Biomolecules* **8**, 30 (2018). (*Review*)

3. **Block S***. “Imaging and characterization of magnetic micro- and nanostructures using force microscopy” in “Surface science tools for nanomaterials characterization” by C.S.S.R. Kumar (ed.), Springer-Verlag Berlin Heidelberg **2015**. (*Book chapter*)

2. **Block S**, Soltwedel O, Nestler P, Helm CA*. „Polyelectrolyte conformation in and structure of polyelectrolyte multilayers” in “Multilayer thin films: sequential assembly of nanocomposite materials” of Gero Decher and Joseph B. Schlenoff (eds.), Wiley Vch **2012**. (*Book chapter*)

1. **Block S**. “Physik: Formeln, Gesetze und Fachbegriffe“ CompactVerlag München **2010**. (*Book)*

Patents

1. **Block S**, Johansson Fast B, Lundgren A, Höök F. New method for sorting of nano-objects.

02.12.2016	WO002017093466A1	(**PCT**)
02.12.2016	EP000003384273B1	(**EU**)
02.12.2016	CN000108431579A	(**China**)
02.12.2016	US000010794816B2	(**USA**)

2. **Block S,** Helm CA. Verfahren zur Messung magnetischer Informationen, insbesondere der magnetischen AC-Suszeptibilität, von magnetischen Nanopartikeln (Markern).

29.10.2010	WO002011051449A1	(**PCT**)
30.10.2009	DE102009046267B4	(**Germany**)

Invited Talks

27. **Block S**. „Time-resolved Extraction of the Binding Stoichiometry in Multivalent Interactions”. *Soft Matter+ Colloquium* (University of Twente), **Enschede 2023**.

26. **Block S**. „Probing Complex Interactions and Reaction Dynamics Using Optical Microscopy”. *56th Manfred Eigen Winterseminar*, **Klosters 2023**.

25. **Block S**. “Quantifying Protein Function using Optical Microscopy”. *Bionano Workshop 2022*, **Berlin 2022**.

24. **Block S**. „ Probing the barrier function of native mucus”. *International Seminar* of the *CRC 1449*, **Berlin 2022**.

23. **Block S**. „ Probing Function and Structure of Membrane Proteins Using Optical Microscopy". *Seminar* of the *Helmholtz Graduate School for Macromolecular Bioscience*, **Teltow 2022**.

22. **Block S**. „Mobility-based Quantification of Complex Interactions Occurring at or within Lipid Bilayers". *TETHMEM: Conference on Tethered Membranes*, **Bonn 2021**.

21. **Block S**. „ Probing the Activity of Heme Copper Oxidases at the Single Enzyme Level". *Satellite Meeting "Proton and proton coupled transport" at the 13th European Biophysics conference*, **Vienna 2021**.

20. **Block S**. „Probing Function and Structure of Membrane Proteins Using Optical Microscopy". *Colloquium of the* Physics Department (FU Berlin), **Berlin 2021**.

19. **Block S**. „Mobility-Based Quantification of Single Virus-Receptor Interactions". *6th "International Healthcare and Life Science & Entrepreneurship" Workshop*, **Copenhagen 2021**.

18. **Block S**. „Probing Single-Molecule Interactions with High Throughput using Microfluidics". *Summer School on Microfluidics* (FU Berlin), **Berlin 2020**.

17. **Block S**. „Probing the Activity of Heme Copper Oxidases at the Single Enzyme Level". *Annual Meeting of the RTG 1947* (University of Greifswald*)*, **Greifswald 2020**.

16. **Block S**. „Mobility-Based Quantification of Single Virus-Receptor Interactions". *Colloquium of the* CRC 803 (Georg-August-Universität Göttingen), **Göttingen 2019**.

15. **Block S**. „Virus-Receptor Interactions: Probing Binding Strengths by Single-Particle Tracking and Receptor Competition". *Colloquium of the* MPI for Colloids and Interfaces, **Potsdam 2019**.

14. **Block S**. „Probing Virus-Receptor Interactions at Interfaces and Within Hydrogels". *5th International Symposium on Multivalency* (FU Berlin), **Berlin 2019**.

13. **Block S**. „Macromolecular Chemistry Meets Biophysics: About Mucin-inspired Binding Inhibitors and Mucus-inspired Biohydrogels". *Hochschullehrer-Nachwuchs-Workshop* of the GDCh Section Macromolecular Chemistry*,* **Marl 2019**.

12. **Block S**. „Mobility-Based Quantification of Virus-Lipid and Lipid-Lipid Interactions". *XXI. Annual Linz Winter Workshop*, **Linz 2019**.

11. **Block S**. „Probing complex interactions using optofluidic approaches". *Summer School on Advanced Optical Microscopy* (FU Berlin), **Berlin 2018**.

10. **Block S**. „Motion at biointerfaces: from single-liposome- to single-lipid-assays". *Colloquium of the* Physics Department (FU Berlin), **Berlin 2018**.

9. **Block S**. „Motion at biointerfaces: from single-liposome- to single-lipid-assays". *Colloquium of the* Physical and Theoretical Chemistry Division (FU Berlin), **Berlin 2018**.

8. **Block S**. „Motion at biointerfaces: from single-liposome- to single-lipid-assays". *Annual Meeting of the RTG 1947 (*University of Greifswald*)*, **Greifswald 2017**.

7. **Block S**. „Mobility-based probing of virus-lipid and lipid-lipid interactions". *TETHMEM: Conference on Tethered Membranes*, **Vienna 2017**.

6. **Block S**. & Höök, F. „Two dimensional flow nanometry for simultaneous determination of size and molecular content of biological nanoparticles". *Conference on Nanobiosurfaces and Interfaces*, **Leuven 2017**.

5. **Block S**. „Quantification of proton pumping and weak, multivalent interactions using single-proteoliposome assays". *Colloquium of the* CRC 1078 (FU Berlin), **Berlin 2017**.

4. **Block S**. „Movement of Biological Nanoparticles Linked to Lipid Membranes". *Colloquium of the* Herminghaus lab (MPI for Dynamics and Self-Organization), **Göttingen 2016**.

3. Höök F, **Block S**. „Surface-sensitive imaging of single vesicles and virus particles for diagnostic and drug-discovery applications". *Colloquium of the* Ewers lab (FU Berlin), **Berlin 2015**.

2. **Block S.** „Different Scaling Behaviour in Mean Field and Scaling Theories Describing Salted Polyelectrolyte Brushes". *Colloquium of the* Fery lab (University of Bayreuth), **Bayreuth 2012**.

1. **Block S**, Helm CA. „Conformation of poly(styrene sulfonate) layers physisorbed from different salt solutions: polyelectrolyte brush domains coexisting with flatly adsorbed chains". *Young European Scientists Meeting*, **Krakow 2010**.