

Curriculum vitae

Name **Tibor Kudernáč**
Birth 19 September 1978, Košice, Slovakia
Nationality Slovak
Marital status Partnership, 2 children (one more in July 2018).

EDUCATION

2007 **PhD in Synthetic Organic Chemistry**, awarded 5 October 2007.
Stratingh Institute for Chemistry, University of Groningen, NL
Thesis title: “*Light-controlled conductance using molecular switches*”
Promoters: Prof. Ben Feringa and Prof. Bart van Wees
2002 **MSc (Red Diploma, highest academic distinction) in Chemistry**
with a major in synthetic organic chemistry.
Faculty of Natural Sciences, University P. Safarik, Slovakia

CURRENT POSITION

Since 2013 **Tenure-track Assistant Professor**, *Life-like supramolecular mechanics*
MESA+ Institute for Nanotechnology, University of Twente, NL

PREVIOUS POSITIONS

2011 – 2013 **Veni Research Fellow**, MESA+ Institute for Nanotechnology, University of Twente, NL
2010 – 2011 **Veni Research Fellow**, Stratingh Institute, University of Groningen, NL
2010 **Visiting Researcher**, Laboratory of Prof. Karl-Heinz Ernst.
Swiss Federal Laboratories for Materials Science and Technology (EMPA)
ETH-Domain, Dübendorf, CH
2009 – 2010 **Junior Research Leader**, Molecular machines on surfaces
Laboratory of Prof. Ben Feringa
Stratingh Institute, University of Groningen, NL
2007 – 2009 **Postdoctoral Research Fellow**, STM and AFM studies on (bio)-molecular systems
Laboratory of Prof. Steven De Feyter
KU Leuven, BE

FELLOWSHIPS, GRANTS AND AWARDS

2018 **Emerging Young Investigator**, *J. Mater. Chem. B* (RSC, IF = 4.54), special issue.
2017 **ECHO grant** from the Netherlands Organisation for Scientific Research (NWO).
ECHO grants are for excellent researchers who carry out high-quality fundamental
research in chemistry. Personal Research Grant, 250 k€.
2016 **EuCheMs Young Investigator**, nominated as the representative for the Netherlands
(only one investigator is invited per country).
2016 **MESA+ Incentive Call for Innovation**, 10 k€ to set up a microfluidic system.

- 2017 - 2021 **PhD Fellowship** for my student Qin Huang, Chinese Scholarship Council, 60 k€
- 2016 - 2020 **PhD Fellowship** for my student Fangyuan Xiu, Chinese Scholarship Council, 60 k€
- 2009 **VENI Award** from the Netherlands Organization for Scientific Research (NWO). VENI grants are for outstanding early career researchers conducting ground-breaking research. Personal Research Grant, 250 k€.
- 2008 **Best Poster Award**, “New Horizons of Photochromism” Conference, Arras, France.
- 2007 - 2009 **Postdoctoral Fellowship**, Belgium Research Foundation - Flanders (FWO). Personal Research Grant, 65 k€

CONFERENCE ORGANISATION

- 2014 – present **Co-founder and organizer** of the Soft Matter Colloquium (monthly). Twente, NL
- 2014 – present **Co-founder and organizer** of the Soft Matter Day (annual conference). Twente, NL
- 2014 **Organizer** of the Dutch-Israeli Meeting “Nanochemistry, Supramolecular chemistry and beyond” with guest speakers Prof. Ben Feringa (Groningen), Prof. Meir Lahav (Weizmann Institute), and Prof. Wilhelm Huck (Nijmegen). Twente, NL

PHD SUPERVISION AND MENTORING OF YOUNG RESEARCHERS

I have served as an academic supervisor for 8 PhD students, and I have trained and mentored 7 young scientists in their post-doctoral period. My group also hosts master students regularly, including international exchange students from Thailand (Mahidol Univ.) and from France (Univ. Lille).

I have served as a co-promotor for PhD students that have already defended their PhD degree successfully: two in Groningen (**Aramel, Johan Visser**), and one in Twente (**Liang Ye**). Among my post-doctoral trainees, **Alejandro Mendez-Ardoy** continued after three years in Twente, with a successful academic career dedicated to responsive supramolecular polymers. As his advisor I am proud that Alejandro was recently awarded a Marie Curie Reintegration Grant to develop self-assembled vesicles and other dynamic supramolecular structures, for therapeutic delivery (CiQUS, Spain).

My research group is dedicated to *Life-like supramolecular mechanics*, and it is entirely based on funding that I have acquired personally and independently. I currently supervise 3 PhD students (**Fangyuan Xiu, Nicolas Cissé, Qin Huang**), and one more PhD student **Supaporn Kwangmettatum** is scheduled to defend her thesis in June 2018, on “*Light-responsive self-assembly towards supramolecular machines*”. This team of four PhD students also includes a master student (**Samer Aphrham**), and will be joined by a self-funded postdoctoral fellow (**Anamarija Knežević**) in June 2018.

TEACHING AND INSTITUTIONAL RESPONSIBILITIES

Teaching at the University of Twente:

- 2017 – **Module Coordinator** for Bachelor in Chemical Engineering (15 ECTS)
- 2015 **Tutor** for the master project Materials and Molecular Science & Technology
- 2014 – **Lecturer** – Nanochemistry (2 ECTS)
- 2014 – **Coordinator and Tutor** for the second year bachelor project Nano-/colloidal- chemistry (2 ECTS).
- 2013 – **Tutor** for the first year bachelor project Fundamentals of chemistry (2.5 ECTS)

OUTREACH AND POPULARISATION

- 2017 Nanotechnology masterclass for second-year secondary school pupils, on the subject of molecular machines.
- 2016 **Interview with the BBC** “*Robot surgeons and artificial life: the promise of tiny machines*”
<http://www.bbc.com/news/science-environment-37563673>
- 2011 **Interview with the BBC** “*Single-molecule electric car taken for test drive*”
<http://www.bbc.co.uk/news/science-environment-15637867>

COMMISSIONS OF TRUST

- 2012 – present **Graduation Committee Member** for 6 PhD theses (Groningen, Wageningen, Twente).
- 2015 **Session chair** at the Dutch National Chemistry Conference (Chains 2015), Veldhoven, NL
- 2014 **Referee** for the Professorship Grant of the Swiss National Science Foundation.
- 2012 **Session chair** at the Lorentz Centre Workshop on dynamic phenomena at interfaces, NL

PEER REVIEW

- 2013 – present **Reviewer** for *Chem. Soc. Rev.*, *ACS Nano*, *J. Org. Chem.*, *Beilstein. J. Org. Chem.*, *Phys. Chem. Chem. Phys.*, *Langmuir*, *Soft. Matter*, *J. Phys. Chem. Lett.*, *J. Appl. Phys.*

KEY COLLABORATORS*International Collaborations*

Steven De Feyter, Professor, Nanochemistry on Surfaces, KU Leuven, Belgium.

Collaboration on using atomic force microscopy and spectroscopy to investigate the force produced by the growth and disassembly of artificial microtubules. This collaboration builds on long-standing collaborative relationships (Chem. Soc. Rev. 2009, JACS 2012 etc.).

Giovanni Pavan, Senior Research Scientist, University of Applied Science of Southern Switzerland.

Collaboration on using multiscale modelling and molecular simulation to study dynamic and responsive molecular systems. One common publication (PNAS 2017), and one more is under submission.

Philipp Kukura, Associate Professor, Department of Physical Chemistry, Oxford, UK.

Collaboration on exploring the dynamics of supramolecular tubules, label-free and with sub-nanometer precision (using interferometric scattering microscopy). Preliminary results revealed that it will be necessary to fix the tubules through streptavidin-biotin bond (the synthesis of biotin-functionalised tubules is ongoing).

Within the MESA+ Institute for Nanotechnology

Jurriaan Huskens, Chair of the Molecular Nanofabrication group

Séverine Le Gac, Applied Microfluidics for BioEngineering Research Group

Nathalie Katsonis, Bio-inspired smart materials

INVITED LECTURES and SEMINARS (personal invitations)

- 2018** Speaker 10th Singapore International Chemical Conference, Singapore.
- 2018** Speaker SFB677 research center “Function by Switching” annual meeting, Kiel, DE.
- 2017** Speaker Ben Feringa Academic Alumni Symposium, Groningen, NL.

2016	Speaker	6 th EuCheMS Young Investigators Workshop, Huelva, Spain.
2015	Focus session	“Bio-mimetic self-assembly”, Dutch Chemistry Conference (CHAINS), NL.
2014	Speaker	Dutch-Israeli Chemistry Meeting, Enschede, the Netherlands
2012	Speaker	Lorentz Centre Workshop, “Dynamic Phenomena at Surfaces”, Leiden, NL.
2012	Seminar	INSP, Université Pierre et Marie Curie (UPMC), Paris, France.
2012	Speaker	Beilstein Symposium, “Molecular Engineering and Control”, Germany.
2012	Plenary	“Foundations of Nanoscience”, Snowbird, Utah, USA.
2012	Seminar	Institut Parisien de Chimie Moléculaire, Université Paris VI, France.
2011	Speaker	Annual MESA+ meeting, University of Twente, NL.
2011	Speaker	ScienTec SPM user meeting, Supelec, France.
2008	Seminar	CEMES-CNRS, Toulouse, France.

LIST OF PUBLICATIONS

Career publications: 42 peer-reviewed journal articles (6 corresponding author). Of the 42 papers, 25 manuscripts were published independent of my PhD research.

Total citations

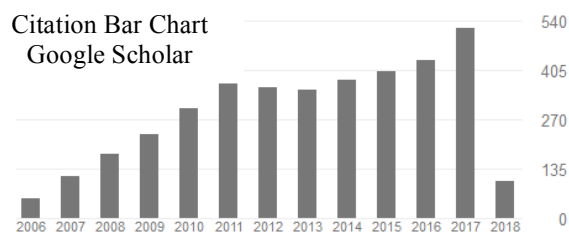
Google Scholar: **3932**

Web of Science: **3051**

Hirsch-index

Google Scholar: **24**

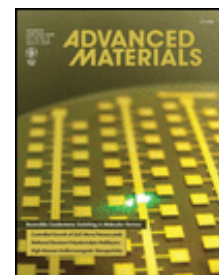
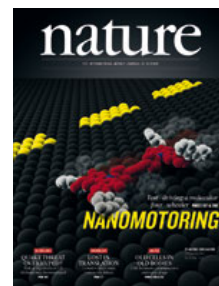
Web of Science: **22**



- (corresponding author) S. Kwangmettatam, **T. Kudernac**. *Chem. Commun.* **2018**, DOI:10.1039/C8CC01780H. *Light-fuelled expansion of spiropyran-based vesicles in water.*
- (corresponding author) J.-W. Fredey, A. Méndez-Ardoy, S. Kwangmettatam, D. Bochicchio, B. Matt, M. C. A. Stuart, J. Huskens, N. Katsonis, G. M. Pavan, **T. Kudernac**. *Proc. Nat. Acad. Sci.* **2017**, *114*, 11850-11855. *Molecular photoswitches mediating the strain-driven disassembly of supramolecular tubules.*
 - Highlighted by the Editors of Nature Nanotechnology. *Nat. Nanotech.* **2017**, *12*, 1019. “Chemical self-assembly: A nonlinear breaking strain”.
 - Commentary and illustrations by Lubbe *et al.* in *Proc. Nat. Acad. Sci.* **2017**, *114*, 11804–11805. “Artificial microtubules burst with energy”.
- A. Méndez-Ardoy, T. Steentjes, B. A. Boukamp, P. Jonkheijm, **T. Kudernac**, J. Huskens. *Langmuir* **2017**, *33*, 8614 – 8623. *Electron-transfer rates in host–guest assemblies at β -cyclodextrin monolayers.*
- S. J. ABhoff, F. Lancia, S. Iamsaard, B. Matt, **T. Kudernac**, S. P. Fletcher, N. Katsonis. *Angew. Chem. Int. Ed.* **2017**, *56*, 3261-3265. *High-Power Actuation from Molecular Photoswitches in Enantiomerically Paired Soft Springs.*
 - Selected as a “very important paper” by the Reviewers (top 5%).

5. L. Ye, A. González-Campo, **T. Kudernac**, R. Núñez, M. P. de Jong, W. G van der Wiel, J. Huskens. *Langmuir* **2017**, *33*, 3635-3638. *Monolayer contact doping from a silicon oxide source substrate.*
6. L. Ye, M. P. de Jong, **T. Kudernac**, W. G van der Wiel, J. Huskens. *Mater. Sci. Semicond. Process.* **2017**, *62*, 128-134. *Doping of semiconductors by molecular monolayers: monolayer formation, dopant diffusion and applications.*
7. J. Veerbeek, L. Ye, W. Vijselaar, **T. Kudernac**, W. G. van Der Wiel, J. Huskens. *Nanoscale* **2017**, *9*, 2836-2844. *Highly doped silicon nanowires by monolayer doping.*
8. (corresponding author) L. Ye, A. González-Campo, R. Núñez, M. P. de Jong, **T. Kudernac**, W. G van der Wiel, J. Huskens, *ACS Appl. Mater. Interfaces* **2015**, *7*, 27357-27361. *Boosting the boron dopant level in monolayer doping by carboranes*
9. E. J. Vriezেকolk, **T. Kudernac**, W. M. de Vos, K. Nijmeijer. *J. of Polym. Sci. B*, **2015**, *53*, 1546-1558. *Composite ultrafiltration membranes with tunable properties based on a self-assembling block copolymer/homopolymer system.*
10. L. Ye, S. P. Pujari, H. Zuilhof, **T. Kudernac**, M. P. de Jong, W. G. van der Wiel, J. Huskens, *ACS Appl. Mater. Interfaces* **2015**, *7*, 3231-3236. *Controlling the dopant dose in silicon by mixed-monolayer doping.*
11. (corresponding author) **T. Kudernac**, A. Kumar Mandal, J. Huskens, *Langmuir* **2015**, *31*, 157-163. *Bi-component H-bonded porous molecular networks at the liquid-solid interface: what is the influence of pre-organization in solution?*
12. H. Wu, K. Sotthewes, A. Méndez-Ardoy, **T. Kudernac**, J. Huskens, A. Lenferink, C. Otto, P. M. Schön, G. J. Vancso, H. J. W. Zandvliet, *Chem. Phys. Lett.* **2014**, *614*, 45-48. *Dynamics of oligo(phenylene-ethynylene) self-assembled monolayers on Au(111).*
13. A. Méndez-Ardoy, T. Steentjes, **T. Kudernac**, J. Huskens, *Langmuir* **2014**, *30*, 3467-3476. *Self-assembled monolayers on gold of β -cyclodextrin adsorbates with different anchoring groups.*
14. S. Iamsaard, S. J. Aßhoff, B. Matt, **T. Kudernac**, J. J. L. M. Cornelissen, S. P. Fletcher, N. Katsonis. *Nature Chem.* **2014**, *6*, 229–235. *Conversion of light into macroscopic helical motion.*
➤ Highlighted in *Chem. Eng. News* 2014, 6, 27 and in *Chemistry World*. Covered by the Dutch national newspaper *De Volkskrant* (10 February 2014).
15. (corresponding author) **T. Kudernac**, T. Kobayashi, A. Uyama, K. Uchida, S. Nakamura, B. L. Feringa. *J. Phys. Chem. A* **2013**, *117*, 8222-8229. *Tuning the temperature dependence for switching in dithienylethene photochromic switches.*
16. T. C. Pijper, **T. Kudernac**, W. R. Browne, B. L. Feringa. *J. Phys. Chem. C* **2013**, *117*, 17623-17632. *Effect of immobilization on gold on the temperature dependence of photochromic switching of dithienylethenes.*
17. (corresponding author) Arramel, T. C. Pijper, **T. Kudernac**, N. Katsonis, M. van der Maas, B. L. Feringa, B. J. van Wees. *Nanoscale* **2013**, *5*, 9277-9282. *Reversible light induced conductance switching of asymmetric diarylethenes on gold: surface and electronic studies.*
18. Arramel, T. C. Pijper, **T. Kudernac**, N. Katsonis, M. van der Maas, B. L. Feringa, B. J. van Wees. *J. Appl. Phys.* **2012**, *111*, 083716. *Electronic properties of individual diarylethene molecules studied using scanning tunneling spectroscopy.*
19. L. F. Dössel, V. Kamm, I. A. Howard, F. Laquai, W. Pisula, X. Feng, C. Li, M. Takase, **T. Kudernac**, S. De Feyter, K. Müllen. *J. Am. Chem. Soc.* **2012**, *134*, 5876-5886. *Synthesis and controlled self-assembly of covalently linked hexaperi- hexabenzocoronene/perylene diimide dyads as models to study fundamental energy and electron transfer processes.*

20. **T. Kudernac**, N. Ruangsupapichat, M. Parschau, B. Macia, N. Katsonis, S. R. Harutyunyan, K.-H. Ernst, B. L. Feringa. *Nature* **2011**, 479, 208-211. *Electrically driven directional motion of a four-wheeled molecule on a metal surface.*
- Featured on the cover page of *Nature*.
 - Highlighted in News & Views of the *Nature* issue and in *Nature Chem.* 2011, 3, 907; *Nature Nanotech.* 2011, 6, 756; *Angew. Chem. Int. Ed.* 2012, 51, 4277-4278; *Chem. Eng. News* 2011, 89, 7.
 - Selected as a “cutting edge chemistry” paper in 2011 by *Chemistry World* 2012, 9, 36.
21. **T. Kudernac**, N. Shabelina, W. Mamdouh, S. Höger, S. De Feyter. *Beilstein J. Nanotechnol.* **2011**, 2, 674–680. *STM visualisation of counterions and the effect of charges on self-assembled monolayers of macrocycles.*
22. D. Mossinger, D. Chaudhuri, **T. Kudernac**, S. Lei, S. De Feyter, J. M. Lupton, S. Hoger. *J. Am. Chem. Soc.* **2010**, 132, 1410-1423. *Large All-Hydrocarbon Spoked Wheels of High Symmetry: Modular Synthesis, Photophysical Properties, and Surface Assembly.*
23. **T. Kudernac**, N. Sanding, T.F. Landaluce, B.J. van Wees, P. Rudolf, N. Katsonis, F. Zerbetto, B.L. Feringa, *J. Am. Chem. Soc.* **2009**, 131, 15655-15659. *Intermolecular Repulsion through Interfacial Attraction: Toward Engineering of Polymorphs.*
24. **T. Kudernac**, N. Katsonis, W.R. Browne, B.L. Feringa, *J. Mater. Chem.* **2009**, 19, 7168-7177. *Nano-electronic switches: Light-induced switching of the conductance of molecular systems.*
25. X. Feng, W. Pisula, **T. Kudernac**, D. Wu, L. Zhi, H. Nok Tsao, S. De Feyter, K. Müllen. *J. Am. Chem. Soc.* **2009**, 131, 4439-4448. *Controlled Self-assembly of C3-symmetric Discotic Nanographenes with Alternating Hydrophilic/Hydrophobic Substituents.*
26. A. Cnossen, D. Pijper, **T. Kudernac**, M. M. Pollard, N. Katsonis, B.L. Feringa, *Chem. Eur. J.* **2009**, 15, 2768-2772. *A Trimer of Ultrafast Nanomotors: Synthesis, Photochemistry and Self-Assembly on Graphite.*
27. **T. Kudernac**, S.-B. Lei, J. A. A. W. Elemans, S. De Feyter. *Chem. Soc. Rev.* **2009**, 38, 402-421. *Two-dimensional supramolecular self-assembly: nanoporous networks on surfaces.*
28. S. J. van der Molen, J. Liao, **T. Kudernac**, L. Bernard, M. Calame, B. J. van Wees, B. L. Feringa, C. Schönenberger. *Nano Letters* **2009**, 9, 76-80. *Light-Controlled Conductance Switching of Ordered Metal-Molecule-Metal Devices.*
29. J. Areephong, **T. Kudernac**, J. J. D. de Jong, G. T. Carroll, D. Pantorotto, J. Hjelm, W. R. Browne, B. L. Feringa. *J. Am. Chem. Soc.* **2008**, 130, 12850-12851. *On/Off Photoswitching of the Electropolymerizability of Terthiophenes.*
30. A. J. Kronemeijer, H. B. Akkerman, **T. Kudernac**, B. J. van Wees, B. L. Feringa, P. W. M. Blom, B. de Boer. *Adv. Mater.* **2008**, 20, 1467-1473. *Reversible Conductance Switching in Molecular Devices.*
- Featured on the cover page
31. N. Katsonis, H. Xu, R. M. Haak, **T. Kudernac**, Z. Tomovic, S. George, M. Van der Auweraer, A. P. H. J. Schenning, E. W. Meijer, B. L. Feringa *Angew. Chem. Int. Ed.* **2008**, 47, 4997-5001. *Emerging solvent-induced homochirality by the confinement of achiral molecules against a solid surface.*
32. W. R. Browne, **T. Kudernac**, N. Katsonis, J. Areephong, J. Hjelm, B. L. Feringa, *J. Phys. Chem. C* **2008**, 112, 1183-1190. *Electro- and photochemical switching of dithienylethene self-assembled monolayers on gold electrodes.*



33. N. Katsonis, A. Minoia, **T. Kudernac**, T. Mutai, H. Xu, H. Uji-i, R. Lazzaroni, S. De Feyter, B. L. Feringa *J. Am. Chem. Soc.* **2008**, *130*, 386-387. *Locking of helicity and shape complementarity in diarylethene dimers on graphite.*
34. D. Dulic, **T. Kudernac**, A. Pugzlys, B. L. Feringa, B. J. van Wees. *Adv. Mater.* **2007**, *19*, 2898-2902. *Temperature gating of the ring-opening process in diarylethene molecular switches.* †**shared first authorship.**
35. N. Katsonis, J. Vicario, **T. Kudernac**, J. Visser, M. M. Pollard, B. L. Feringa, *J. Am. Chem. Soc.* **2006**, *128*, 15537-15541. *Self-organized monolayer of meso-tetradodecylporphyrin coordinated to Au(111).*
36. **T. Kudernac**, S. J. van der Molen, B. J. van Wees, B. L. Feringa. *Chem. Commun.* **2006**, 3597-3599. *Uni- and bi-directional light-induced switching of diarylethenes on gold nanoparticles.*
 - Selected as a “hot paper” by the Editors and highlighted in *Chemical Science: Flicking the switch at the nanoscale*, *10*, 2006.
37. N. Katsonis, **T. Kudernac**, M. Walko, S. J. van der Molen, B. J. van Wees, B. L. Feringa, *Adv. Mat.* **2006**, *18*, 1397-1400. *Reversible conductance switching of single diarylethenes on a gold surface.*
38. S. J. van der Molen, H. van der Vegte, **T. Kudernac**, I. Amin, B. L. Feringa, B. J. van Wees, *Nanotechnology* **2006**, *17*, 310-314. *Stochastic and photochromic switching of diarylethenes studied by scanning tunneling microscopy.*
39. W. R. Browne, J. J. D. de Jong, **T. Kudernac**, M. Walko, L. N. Lucas, K. Uchida, J. H. van Esch, B. L. Feringa, *Chem. Eur. J.* **2005**, *11*, 6414-6429. *Oxidative electrochemical switching in dithienylcyclopentenes, part 1: Effect of electronic perturbation on the efficiency and direction of molecular switching.*
40. W. R. Browne, J. J. D. de Jong, **T. Kudernac**, M. Walko, L. N. Lucas, K. Uchida, J. H. van Esch, B. L. Feringa, *Chem. Eur. J.* **2005**, *11*, 6430-6441. *Oxidative electrochemical switching in dithienylcyclopentenes, part 2: Effect of substitution and asymmetry on the efficiency and direction of molecular switching and redox stability.*
41. **T. Kudernac**, J. J. D. de Jong, J. H. van Esch, B. L. Feringa, D. Dulic, S. J. van der Molen, B. J. van Wees, *Mol. Cryst. Liq. Cryst.* **2005**, *430*, 205-210. *Molecular switches get wired: Synthesis of diarylethenes containing one or two sulphurs.*
42. D. Dulic, S. J. van der Molen, **T. Kudernac**, H. T. Jonkman, J. J. D. de Jong, T. N. Bowden, J. H. van Esch, B. L. Feringa, B. J. van Wees. *Phys. Rev. Lett.* **2003**, *91*, 207402. *One-way optoelectronic switching of photochromic molecules on gold.*