

# Functional DNA Nanotechnology, 7-9 October 2020

## Workshop Programme

### Wednesday 7th October:

- 12:00- 13:40            **Registration + refreshments**
- 13:40 - 14:10            **Invited Lecture 1:** Hendrik Dietz, Technische Universität München: "Molecular devices and machines made from DNA"
- 14:10 - 14:30            **O1:** Björn Högberg, Karolinska Institutet: "Spatial inference by sequencing"
- 14:30 - 14:50            **O2:** Izabela Kamińska, Institute of Physical Chemistry of the Polish Academy of Sciences: "Graphene/DNA nanotech for biosensing and superresolution"
- 14:50 - 15:10            **Flash presentations** (2 minutes each x 5)
- 15:10 – 16:40            **Coffee Break + poster session**
- 16:40 - 17:00            **O3:** Elise Y. Gayet, PSL University, CNRS, Paris: "Biochemically Programming the Dynamic Optical Properties of DNA-Templated Plasmonic Nanostructures"
- 17:00 - 17:10            **O4 (short):** Marc Van Der Hofstadt, Sorbonne Université, CNRS: "Spatiotemporal patterning of living cells with extracellular DNA programs"
- 17:10 - 17:20            **O5 (short):** Eva Bertosin, Technische Universität München: "Cryo EM of a DNA origami stator/rotor coupled mechanism"
- 17:20 - 17:40            **O6:** Fabian Kohler, Technische Universität München: "Revealing the structures of megadalton-scale DNA complexes with nucleotide resolution"
- 17:40 - 19:00            **Poster session**

### Thursday 8th October:

- 9:00 - 9:30            **Invited Lecture 2:** Kerstin Göpfrich, Max Planck Institute for Medical Research: "A shortcut towards synthetic cell division"
- 9:30 - 9:50            **O7:** Kurt Gothelf, Aarhus University: "Protein Conjugates in Drugs, Biosensors and DNA Nanotechnology"
- 9:50 - 10:10            **O8:** Amelie Heuer-Jungemann, Ludwig-Maximilians-Universität, Munich: "Nanoscale Organization of FasL on DNA Origami as a Versatile Platform to Tune Apoptosis Signaling in Cells"

- 10:10 - 10:30      **09:** Will Kaufhold, University of Cambridge: “Probes for Proximity Sensitive Super-Resolution Microscopy”
- 10:30 - 10:40      **Flash presentations** (2 minutes each x 5)
- 10:40 - 12:00      **Coffee break + poster session**
- 12:00 - 12:10      **010 (short):** Joonas Ryssy, Aalto University: “Light-controlled dynamic chiral plasmonic metamolecules”
- 12:10 - 12:30      **011:** Wooli Bae, Imperial College London: “In situ generation of RNA complexes for synthetic molecular strand displacement circuits in autonomous systems”
- 12:30 - 12:40      **012 (short):** Ece Büber, Ludwig–Maximilians–Universität München: “A Curvature Ruler: Sensing by DNA Nanotech”
- 12:40 - 12:50      **013 (short):** Heini Ijäs, Aalto University: “Drug loading and release mechanisms of DNA origami carriers”
- 12:50 - 14:20      **Lunch**
- 14:20 - 15:10      **Dynamic Biosensor presentation.** Alice Soldà; “DNA-based sensing using switchSENSE® technology: from the preparation of pure protein-DNA conjugates to the discovery of molecular interactions”
- 15:10 - 20:00      **Social programme (guided tour to Villa d’Este, Tivoli)**
- 20:00                **Social dinner + Award Ceremony**

## **Friday 9th of October**

- 9:00 - 9:20            **Invited Lecture 3:** Prof. Dr. Philip Tinnefeld, Ludwig Maximilians-Universität München: “Sensing with DNA origami devices”
- 9:20 - 9:40            **014:** Diana Sobota, University of Cambridge: “Cations regulate interactions between DNA and zwitterionic lipid membranes via two electrostatic mechanisms”
- 9:40 - 10:00          **015:** Giuliano Zanchetta, Università degli Studi di Milano: “Design and optimization of a rapid, multiplex miRNA assay without washing steps”
- 10:00 - 10:10          **016: (short):** Ismael Mullor Ruiz, Imperial College London: “Implementation of out-of-equilibrium catalytic reaction networks using the Active Circuits of Duplex Catalysts (ACDC) framework”
- 10:10 - 11:10          **Coffee break + poster discussion**
- 11:10 - 11:30          **017:** Emanuela Torelli, Newcastle University, UK: “Towards in vivo origami: cotranscriptional folding of a bio-orthogonal scaffolded RNA nanoribbon”

11:30 – 11:50      **O18:** Alessandro Bertucci, University of Rome Tor Vergata: “Protein-Controlled, Artificial Biomolecular Communication Pathways Mediated by Synthetic DNA Translators”

11:50 - 12:00      **O19(short):** Enrico Cadoni, Ghent University: “Catch and Release me: a Reversible, Diels-Alder-Based Approach for AuNP-PNA Conjugation”

12:00 – 12:45      **ITN-DNA Robotics talk:** Joachim Stehrs, GNA Biosolutions GmbH

12:45 - 12:50      **Closing remarks**

12:45                **Refreshments**

## LIST OF POSTERS

P1: Javier Cabello-Garcia, Imperial College London

“Handhold-mediated strand displacement: a nucleic acid-based reaction to implement far-from-equilibrium templating”

P2: Igor Baars, Karolinska Institutet: “DNA Spatial reconstruction using barcoded DNA sequences”

P3: Nada Farag, University of Rome, Tor Vergata: “Activity-based monitoring of DNA repair enzymes using programmable Triplex-forming nanoswitches”cabell

P4: Marco Lolaico, Karolinska Institutet: “Enhanced stiffness of wireframe DNA nanostructures with square lattice edges”

P5: Alba Monferrer i Sureda, Technical University of Munich: “Orthogonally controlled DNA Origami dynamic self-assembly”

P6: Lorena Baranda Pellejero, University of Rome Tor Vergata: “DNA-templated reactions controlled by biomolecules”

P7: Renukka Yaadav, Ludwig-Maximilians-Universität München: “Like to fluoresce? Don’t get too close to graphene! DNA origami nanopositioners for biosensing on graphene”

P8: Anushree Dutta, University of Potsdam: “DNA Origami Based Plasmonic Nanostructures for Single Molecule SERS study of Biomolecules”

P9: Riddhi Nagda, Yonsei University, Seoul: “Structural shift of DNA template between hairpin and dimer tunes the emission colour of DNA-templated AgNCs”

P10: Michael Scheckenbach, Ludwig–Maximilians–Universität München: “Self-Regeneration and Self-Healing in DNA Origami Nanostructures”

P11: Jeanne Heintz, ESPCI Paris, PSL University, CNRS, Paris: “DNA as a Versatile Scaffold to Strongly Couple a Known Number of Fluorescent Emitters to a Plasmonic Cavity”

P12: Julian Bauer, Ludwig-Maximilians-Universität München: “Characterizing DNA methylations with DNA-PAINT kinetics”

P13: Enrico Cadoni, Ghent University: “Visible-light triggered templated ligation on surface using furan-modified PNAs”

P14: Luka Vanjur, Università degli Studi di Milano: “Fundamental steps in functional DNA nanotechnology: kinetics of DNA hybridization”

P15: Michele Stasi, Technical University of Munich: “Powering DNA Nanotechnology with Chemical Reaction Cycle”

P16: Yash V. Bogawat, Technical University of Munich: “Roller Skates for DNA Robots Active microcarriers for DNA origami nanorobots”

P17: Minke A.D. Nijenhuis, Interdisciplinary Nanoscience Center (iNANO) and the Department of Chemistry, Aarhus University: “A DNA-based Bowden cable for long-distance force transfer in nanorobotics”

P18: Sara Bracaglia, University of Rome, Tor Vergata: “DNA-based nanodevices for the point-of-care electrochemical detection of antibodies”

P19: Michael T. Pinner, Technical University of Munich: “Artificial membrane budding utilising DNA origami”

- P20: Maximilian N. Honemann, Technical University of Munich: "A novel lattice design for scaffolded DNA origami structures"
- P21: Mihir Dass, Ludwig-Maximilians-Universität München: "There's plenty of vroom at the bottom, Dynamic DNA structures at the nano- and microscale"
- P22: Christian Sigl, Technical University of Munich: "Self-Assembly of DNA-Based icosahedral shells as molecular basis for virus trapping"
- P23: Néstor Sampredo, Aarhus University: "Single stranded RNA Origami sensors based on mechanical structural changes in fluorogenic aptamers"
- P24: Pratik Shah, Yonsei University: "Noncanonical Head-to-Head Hairpin DNA Dimerization at Interfacial Binding Sites by Orange Emissive Silver Nanoclusters"
- P25: Erica Del Grosso, University of Rome, Tor Vergata: "Transient control of DNA-based systems"
- P26: Daniela Sorrentino, University of Rome Tor Vergata: "Rational control of the activity of a Cu<sup>2+</sup>-dependent DNase by re-engineering purely entropic intrinsically disordered domains"
- P27: Aitor Patino Diaz, University of Rome Tor Vergata: "Bioengineering in vitro transcription circuits controlled by Antibodies"
- P28: Wouter Engelen, Technical University of Munich: "Real-time single-particle tracking of higher-order DNA origami"
- P29: Angel E. Santorelli Villamizar, Interdisciplinary Nanoscience Center, Aarhus University: "Will it Bend? DNA-Grafted Azobenzene Polymer as a Light-Mediated Molecular Actuator for dynamic DNA Nanostructures"
- P30: Anna-Katharina Pumm, Technical University of Munich: "Self-Assembly of Nanoscale Rotary Mechanisms"
- P31: Simona Ranallo, University of Rome Tor Vergata: "Orthogonal regulation of DNA nanostructure self-assembly and disassembly using antibodies"