Venice International University
VIU Summer School
Exploring Nucleic Acids: from biophysics to molecular biology

September 21-25, 2026

Faculty
Claudia Sissi, University of Padova
Riccardo Rigo, University of Padova
Francesco Mantegazza, University of Milano-Bicocca
Elisabetta Groaz, KU Leuven
Jurij Lah, University of Ljubljana
Caterina Carraro, German Center for Neurodegenerative Diseases
Lukas Trantirek, Central European Institute of Technology of Masaryk University
Erica Del Grosso, University of Rome, Tor Vergata
Janez Plavec, Slovenian NMR centre

Program

Monday, September 21

9:00 - 9:30 Registration and Welcome remark

9:30 – 10:30: STRUCTURAL FEATURES OF NUCLEIC ACIDS (Prof. Riccardo Rigo)

10:30 – 11:00: Coffee break

11:00 – 12:00: STRUCTURAL FEATURES OF NUCLEIC ACIDS (Prof. Riccardo Rigo)
12.00 – 12.30: Q&A

12:30 – 14:00 Lunch

14:00 – 16:00: STRUCTURAL CHARACTERIZATION OF NUCLEIC ACIDS IN VITRO: METHODS AND CRITICAL ASPECTS (Prof. Janez Plavec)

16:00 – 16:30 Break

16:30 – 17:30 STUDENTS FLASH PRESENTATIONS

Tuesday, September 22

9:00 – 11:00: STRUCTURAL CHARACTERIZATION OF NUCLEIC ACIDS IN CELL: METHODS AND CRITICAL ASPECTS (Prof. Lukas Trantirek)

11:00 - 11:30 Coffee break

11:30 – 12:30: BIOPHYSICS OF NUCLEIC ACIDS: THERMODYNAMIC ANALYSIS (Prof. Jurij Lah)

12:30 – 14:00 Lunch

14:00 – 15:00: BIOPHYSICS OF NUCLEIC ACIDS: THERMODYNAMIC ANALYSIS (Prof. Jurij Lah)

15:00 – 15:30 Break

15:30 -17:30: BIOPHYSICS OF NUCLEIC ACIDS: SINGLE-MOLECULE APPROACHES (Prof. Francesco Mantegazza)

Evening Social Dinner in Venice

Wednesday, September 23

9:30 – 11:00: NUCLEIC ACIDS IN MEDICINAL CHEMISTRY: PHARMACEUTICAL TARGETS (Prof. Claudia Sissi)

11:00 -11:30 Coffee break

11:30 – 13:00: NUCLEIC ACIDS IN MEDICINAL CHEMISTRY: DRUGS (Prof. Elisabetta Groaz)

13:00 – 14:00 Lunch

Free afternoon

Thursday, September 24

9:30 - 10:45: HIGH-DIMENSIONAL ANALYSIS OF NUCLEIC ACIDS: THEORETICAL INTRODUCTION (Prof. Caterina Carraro)

10:45 - 11:15 Coffee break

11:15 – 12:30: HIGH-DIMENSIONAL ANALYSIS OF NUCLEIC ACIDS: THEORETICAL INTRODUCTION (Prof. Caterina Carraro)

12:30 – 14:00 Lunch

14:00 – 17:00 HIGH-DIMENSIONAL ANALYSIS OF NUCLEIC ACIDS: PRACTICAL SESSION (Prof. Caterina Carraro)

17:30 – 18:30 One-to-one discussion with experts

Friday, September 25

9:00 – 11:00: NUCLEIC ACID-BASED NANOTECHNOLOGIES (Prof. Erica Del Grosso)

11:00 - 11:30 Coffee break

11:30 – 12:30: FINAL TEST

12:30-13:00: CONCLUDING REMARKS

13:00 – 14:00 Lunch

Faculty's short bio

Claudia Sissi is a Full Professor at the Department of Pharmaceutical and Pharmacological Sciences at the University of Padova. Her main research focus concerns the quantitative analysis of the interactions between biological macromolecules (proteins, polysaccharide, nucleic acids) with small ligands presenting potential pharmacological activity. Currently, she is actively involved in defining the molecular basis of selective recognition of different nucleic acid structures *in cell* and on their targeting for therapeutic purposes. Her main experience concerns biophysical and molecular-biology techniques.

Riccardo Rigo is a Researcher in the Department of Pharmaceutical and Pharmacological Sciences at the University of Padova. His primary research interests include the study of non-canonical nucleic acid structures and nucleic acid-binding proteins as potential pharmaceutical targets. He also explores their roles in fundamental biological processes and disease mechanisms. Additionally, he focuses on the discovery and development of small molecule drugs with potential antiviral and antitumor activity, designed to interact with these targets.

Francesco Mantegazza is a Professor in the School of Medicine and Surgery at the University of Milano-Bicocca. His scientific research activity is devoted to the experimental study of the nanomechanical properties of single molecules and single cells or tissues. The objective is providing quantitative information about complex and unknown relevant biophysical issues, such as DNA compaction inside nucleus, surface elasticity of cancer or healthy cells or tissues, DNA superstructures, and conformation of intrinsically disordered proteins.

Elisabetta Groaz is a Research Expert Rega Institute for Medical Research in KU Leuven. Her research aims to explore uncharted biological functions driven or encoded by non-natural nucleoside and nucleic acid analogues. It pursues the disruptive design of (bio)chemical tools with the inherent potential of introducing means and capabilities to both drug discovery and biotechnology that up to now were largely considered impracticable. This extends from synthetic molecules that can act as inactive precursors of therapeutic agents to others that may function as substrates of processing enzymes such as polymerases or act as catalysts in cellular metabolism.

Jurij Lah is Professor of Physical Chemistry at the Faculty of Chemistry and Chemical Technology, University of Ljubljana. His research interests include: thermodynamic stability, interactions and structural features of biologically important molecules in relation to their function. Recently, his research has focused on the description of the behaviour of non-canonical nucleic acids and intrinsically disordered proteins**.**

Caterina Carraro is a postdoctoral researcher at the Institute for Stroke and Dementia (LMU Klinikum Munich). She has a bachelor's degree in Biotechnologies, at Department of Biology, a master's Degree in Pharmaceutical Biotechnologies at Department of Pharmaceutical and Pharmacological Sciences and a Ph.D. in Molecular Sciences obtained at the University of Padova. Her current research is focused on the use of multiomics approaches in drug discovery and in clinical studies, applied to diverse pathological settings including cancer and neurodegeneration.

Lukas Trantirek is the head of the "Non-Coding Genome" research group at the Central European Institute of Technology of Masaryk University (CEITEC MU) in Brno, Czech Republic. He completed his PhD in organic chemistry at Masaryk University in Brno and subsequently gained international experience through postdoctoral fellowships at the University of California in Los Angeles, USA, and Johannes Kepler University in Linz, Austria. Between 2009 and 2015, he worked as a visiting associate professor at Utrecht University in the Netherlands. He focuses on cellular structural biology of nucleic acids using NMR spectroscopy.

Janez Plavec is the head of the Slovenian NMR Centre at the National Institute of Chemistry and Professor of Structural Biology at the University of Ljubljana. His research interests include the structure and dynamics of biomacromolecular systems studied by NMR spectroscopy, protein structure, and the interactions of small molecules and metal ions with DNA and RNA.

Erica Del Grosso is Associate Professor at the Department of Chemical Sciences and Technologies at the University of Rome "Tor Vergata". Her research activity is focused in the field of DNA Nanotechnology developing DNA-based nanodevices for sensing and diagnostic applications. She has also demonstrated several strategies to control the assembly/disassembly and reconfiguration of DNA-based nanostructures with dissipative and out-of-equilibrium behaviour.