



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

PROGRAMME

SUNDAY, AUGUST 24TH, 2014

- 15.00 Registration
- 18:00 Opening Ceremony
 Welcome addressess
 The IS3NA Award to Prof. Kyoichi A. Watanabe
 Opening lecture
 Concert
- 19.15 Reception

MONDAY, AUGUST 25TH, 2014

Session 1

- 08:30 *Nucleoside Therapeutics: Past Successes and Future Challenges*
 Dennis C. Liotta, Emory University, USA (plenary)
- 09:15 *Discovery of Novel Nucleotides for the Treatment of HCV*
 Cyril Dousson, IDENIX Pharmaceuticals, Montpellier, France (invited)
- 09:50 *Syntheses of Novel 2'-Fluoro-4'-thiopurine Nucleosides and Their 5'-O-Triphosphates as Potential Influenza Inhibitors*
 Vivek K. Rajwanshi, Alios BioPharma Inc., USA
- 10:10 *The TriPPro Approach: New Insights in Nucleoside Triphosphate Prodrugs*
 Chris Meier, University of Hamburg, Germany
- 10:30 Coffee break

Session 2

- 10:50 *Spiegelzymes a New Tool for Molecular Biology and Molecular Medicine*
 Volker A. Erdmann, Freie Universität Berlin, Germany (invited)
- 11:25 *Continuous Improvement of LNA Antisense Drug Development*
 Marie W. Lindholm, Santaris Pharma a/s, Denmark (sponsored lecture)



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

12:00 *Programmable and Conditional Gene Control by Clinical Drugs in Microbial and Mammalian Cells Using Synthetic RNA Switches*
Andrew L. Chang, Stanford University, USA

12:20 *Large-Scale Manufacture of shRNA in the Solid-Phase: Using RNA Structure to Your Advantage*
Eduardo Paredes, Nitto Denko Avecia, USA

12:40 Lunch

Session 3

13:50 *Epigenetic Therapy of Leukemia using Nucleoside Analogues that Inhibit DNA and Histone Methylation*
Richard L. Momparker, CHU Sainte-Justine and University of Montreal, Canada (invited)

14:25 *Development of 4'-Selenonucleoside*
Lak Shin Jeong, Seoul National University, Korea (invited)

15:00 *Synthesis and Cytostatic Evaluation of 4-N-Alkanoyl and 4-N-Alkyl Gemcitabine Analogues Suitable for Positron Emission Tomography*
Stanislaw F. Wnuk, Florida International University, USA

15:20 *Molecularly Imprinted Polymer for Selective Recognition of Pseudouridine*
Aleksandra Krstulja, Université d'Orléans, France

15:40 *Spherical Nucleic Acids (SNAs) as Potent ImmunoModulatory Agents*
Sergei M. Gryaznov, AuraSense Therapeutics, USA

Session 4

16:20 *Nucleoside 1,2,3-Triazoles as Antiviral Scaffolds*
Zhengqiang Wang, University of Minnesota, USA (invited)

16:55 *Advances in the Development of Nucleoside Analogues Targeting 5'-Nucleotidase cN-II*
Suzanne Peyrottes, CNRS-University of Montpellier, France (invited)

17:30 Poster session 1
(45 minutes odd numbers, then 45 minutes even numbers)



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

TUESDAY, AUGUST 26TH, 2014

Session 5

- 08:30 *Developments in the Synthesis and Applications of RNA and Analogues*
Masad J. Damha, McGill University, Montreal, Canada (invited)
- 09:05 *On Tricyclo-DNA*
Christian J. Leumann, University of Berne, Switzerland (invited)
- 09:40 *Intracellular Monitoring of siRNA by Conjugation of Fluorescent Probe*
Yukiko Kamiya, Nagoya University, Japan
- 10:00 *Hepatic Targeting Using Multivalent N-Acetylgalactosamine Conjugation Significantly Improves Potency of Antisense Oligonucleotide in Mice*
Thazha P. Prakash, Isis Pharmaceuticals Inc., USA
- 10:30 Coffee break

Session 6

- 10:50 *New Fluorescent Nucleosides for Studying RNA-Based Processes*
Yitzhak Tor, University of California, San Diego, USA (invited)
- 11:25 *Synthetic Functional DNA and RNA Architectures: Fluorescence, Energy Transfer and Photochemistry*
Hans-Achim Wagenknecht, Karlsruhe Institute of Technology, Germany (invited)
- 12:00 *Assembly-Dependent Fluorescence Enhancing Nucleic Acids (AFENA) in Sequence-Specific Labelling of Double-Stranded DNA*
Vyacheslav V. Filichev, Massey University, New Zealand
- 12:20 *Highly Efficient Crosslink Reactions Triggered by Oxidation*
Fumi Nagatsugi, Tohoku University, Japan
- 12:40 Lunch

Session 7

- 13:50 *Design and Construction of Fluorescent Nucleic Acid Systems*
Byeang Hyeon Kim, Pohang University of Science and Technology, Korea (invited)
- 14:25 *Green Processes for the Synthesis and Scale-up of Protected Nucleosides Using Biocatalysis*
Miguel Ferrero, University of Oviedo, Spain



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

- 14:45 *An Efficient Method for Bromination of Nucleosides*
Jyotirmoy Maity, Karolinska Institute, Sweden
- 15:05 *How to Prepare 4'-SelenoRNA?*
Noriaki Minakawa, University of Tokushima, Japan
- 15:25 *Synthesis and Properties of New Triplex Forming Oligonucleotides Containing Thiolated Nucleobases*
Yoshiaki Masaki, Tokyo Institute of Technology, Japan
- 15:45 *Novel Uncharged Oligonucleotide Analogues with Modified Internucleoside Phosphate Groups*
Dmitry A. Stetsenko, Institute of Chemical Biology and Fundamental Medicine, Novosibirsk, Russia
- 16:05 Coffee break
- Session 8**
- 16:25 *The role of Nucleoside and Nucleotide Kinases in Chemotherapy*
Staffan Eriksson, Biochemistry, BMC, Uppsala, Sweden (invited)
- 17:00 *N-Oxides in the Synthesis of Nucleotide Analogues*
Michał Sobkowski, Institute of Bioorganic Chemistry, Poznań, Poland
- 17:20 *Synthesis of ANPs Containing Trisubstituted Alkenes Through Chemo-Enzymatic and Ultrasound-assisted Olefin Cross-Metathesis*
Vincent Roy, Université d'Orléans, France
- 17:40 Poster session 2
(45 minutes even numbers, then 45 minutes odd numbers)

WEDNESDAY, AUGUST 27TH, 2014

Session 9

- 08:30 *Effects of Molecular Crowding on the Structures, Interactions, and Functions of Nucleic Acids: Beyond the Watson-Crick Double Helix*
Naoki Sugimoto, Konan University, Kobe, Japan (invited)
- 09:05 *Template-Directed Synthesis*
Clemens Richert, University of Stuttgart, Germany (invited)



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

09:40 *Towards the De Novo Design of DNA Based Catalytic Sites Using a Combined NMR and In Silico Approach*
Jose C. Martins, University of Gent, Belgium

10:00 *Aptamer AS1411 Modified with LNA or UNA*
Jesper Wengel, University of Southern Denmark, Odense, Denmark

10:20 *Codon-Anticodon Interactions in Relation to tRNA Damage in Oxidative Stress*
Barbara Nawrot, Centre of Molecular and Macromolecular Studies, Lodz, Poland

10:40 Coffee break

Session 10

11:00 *Nucleos(t)ides: A Rich Source of Anticancer and Antiviral Agents*
David C. K. Chu, University of Georgia, Athens, USA (Montgomery Award lecture)

11:45 *PPN Pyrophosphate for the Preparation of Nucleoside Di- and Triphosphates*
Heidi J. Korhonen, Durham University, UK

12:05 *Modified Nucleoside Triphosphates – a Versatile Gateway for the Generation of Highly Functionalized Nucleic Acids*
Marcel Hollenstein, University of Bern, Switzerland

12:25 *Synthesis and Purification of 5'-Triphosphorylated Oligoribonucleotides via Gamma-substituted Analogues*
Marion Goldeck, University Hospital Bonn, Germany

12:45 *IS3NA members' report and IRT 2016 presentation*

13:15 Lunch

Free afternoon

18:00-21:00 Picnic

THURSDAY, AUGUST 28TH, 2014

Session 11

08:30 *PNA and PMO Oligonucleotides for RNA Targeting Towards Therapeutic Applications*
Mike Gait, MRC Laboratory of Molecular Biology, UK (invited)



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

- 09:05 *Lessons Learned from Alternative mRNA Caps*
Edward Darżynkiewicz, University of Warsaw, Poland (invited)
- 09:40 *Chemical Synthesis of 5'-Triphosphate RNA, 5'-Capped RNA and their 5'-Modified Triphosphate Analogs, Substrates of Capping Enzymes*
Françoise Debart, University of Montpellier 2, France
- 10:00 *Efficient Synthesis of 5'-Capped Oligonucleotide Using O-N Phosphoryl Migration of Phosphoramidite*
Atsushi Shimoyama, Tokyo Institute of Technology, Japan
- 10:20 Coffee break

Session 12

- 10:50 *XNA Chemistry: Towards Synthetic Genes and Genomes*
Piet Herdewijn, KU Leuven, Belgium (Imbach-Townsend Award lecture)
- 11:25 *Nucleic Acids With Additional Nucleobases*
Poul Nielsen, University of Southern Denmark, Odense, Denmark
- 11:45 *Polymerase Synthesis of Base-Modified DNA: New Methods and New Applications*
Michal Hock, Institute of Organic Chemistry and Biochemistry, Prague, Czech Republic
- 12:05 *Omne Vivum Ex Vivo ... Omne ?*
Peter Strazewski, Université Claude Bernard Lyon 1, France
- 12:25 Lunch

Session 13

- 13:45 *G-quadruplexes - NMR Insights into Structure and Cation Binding*
Janez Plavec, National Institute of Chemistry, Slovenia (invited)
- 14:20 *G-quadruplexes and Heme: an Unholy Nexus?*
Dipankar Sen, Simon Fraser University, Canada (invited)
- 14:55 *Template Assembled Synthetic DNA and RNA G-quadruplex*
Thomas Lavergne, University of Grenoble Alpes, France
- 15:15 *Improvements to Prediction of RNA Secondary Structure from Sequence*
Brent M. Znosko, Saint Louis University, USA
- 15:35 Coffee break



Chemical Biology of Nucleic Acids

Organizers:

Wojciech T. MARKIEWICZ
Henryk KORONIAK

Session 14

- 15:55 *DNA-Origami for Biomedical Applications*
Ramon Eritja, Institute for Advanced Chemistry of Catalonia, Spain
- 16:15 *Nanomechanical DNA Origami Devices for Biomolecular Sensing*
Akinori Kuzuya, Kansai University, Osaka, Japan
- 16:35 *DNA: Not Merely the Secret of Life*
Nadrian C. Seeman, New York University, USA (plenary)
- 17:20 Closing remarks and close