Program

Sunday, 26 August

15:00  Registration Opens

18:00  Opening
   Chris Meier

18:05  Jean-Louis Imbach: In Memoriam
   Jean-Jacques Vasseur

18:10  Keynote Lecture
   Introduction: Ulrich Mueller
   Gerald Joyce, Salk Institute, USA
   RNA-Targeted drug discovery

19:00  RECEPTION
   Kindly sponsored by TriLink Biotechnologies

Monday, 27 August

8:00   CONTINENTAL BREAKFAST

Session 1
   Session Chair: Natasha Paul

8:30   Invited Lecture (IL1)
   Suzanne Peyrottes, Institut des Biomolécules Max Mousseron, France
   One-Pot synthesis of nucleotides in water-medium

9:00   Invited Lecture (IL2)
   Troels Koch, Roche Innovation Center Copenhagen, Denmark
   Stereodefined LNA phosphorothioates: Design, synthesis and properties

9:30   Oral Presentation (OP1)
   Olivia Schmidt, University of Zurich, Switzerland
   Metallo base pair mediates dynamic isomerization of a duplex DNA

9:50   Oral Presentation (OP2)
   Akira Ono, Kanagawa University, Japan
   Preparations and structure elucidations of metallo-DNAs: DNA nanowire with uninterrupted one-dimensional silver ion array

10:10  COFFEE BREAK
Session 2
Session Chair: Masad Damha

10:40 Award Lecture (AW1)
Michael Sofia, Arbutus Biopharma Corporation, USA
Viral hepatitis: the search for a cure

11:20 Invited Lecture (IL3)
Charles McKenna, University of Southern California, USA
DNA polymerases: mechanistic insights from designed substrate analogues

11:50 Oral Presentation (OP3)
Stéphane Bogen, Merck & Company, USA
Design and optimization of novel nucleoside prodrug clinical candidates for the treatment of HCV – Impact on metabolism and delivery to target tissue

12:10 LUNCH BREAK

Session 3
Session Chair: Sergei Gryaznov

13:20 Invited Lecture (IL4)
Joanna Kowalska, University of Warsaw, Poland
Phosphate-modified nucleotides as molecular tools for probing and modulating protein activity

13:50 Invited Lecture (IL5)
Luigi Agrofoglio, University of Orleans, France
Overview of (E)-4-phosphono-but-2-en-1-yl acyclic nucleosides – synthesis and antiviral activity

14:20 Oral Presentation (OP4)
Rakesh Veedu, Murdoch University, Australia
Novel chemically modified oligonucleotides as potential molecules for precision therapy of neuromuscular diseases

14:40 Oral Presentation (OP5)
Christelle Dupouy, University of Montpellier, France
RNA hairpin-duplex conversion controlled by a reduction-responsive 2',2'-disulfide-bridged dinucleotide

15:00 COFFEE BREAK
Session 4
Session Chair: Byron Purse

15:30 Oral Presentation (OP6)
Mattias Bood, Gothenburg University, Sweden
*Emissive quadra- and pentacyclic adenine derivatives*

15:50 Oral Presentation (OP7)
Takehiko Wada, Tohoku University, Japan
*Remarkable enhancement of RNaseH cleavage activities of RNA complexed with peptide ribonucleic acid (PRNA)—Novel backbone modification strategy for nuclease cleavage activity improvements*

16:10 POSTER SESSION

17:00 BEER GARDEN
Kindly Sponsored by TriLink Biotechnologies

Tuesday, 28 August

8:00 CONTINENTAL BREAKFAST

Session 5
Session Chair: Steven Dowdy

8:30 Invited Lecture (IL6)
Punit Seth, Ionis Pharmaceuticals, USA
*Engineering selectivity into therapeutic oligonucleotides through chemical design*

9:00 Invited Lecture (IL7)
Muthiah Manoharan, Alnylam Pharmaceuticals, USA
*RNAi for human therapeutics: the end of the beginning*

9:30 Oral Presentation (OP8)
Erik Rozners, Binghamton University, SUNY, USA
*Amide-modified RNA: synthesis, structure and RNAi activity*

9:50 Oral Presentation (OP9)
David Perrin, University of British Columbia, Canada
*Chemically modified DNAzymes as sequence-specific ribonuclease-A mimics – From potential therapeutics to the origin of life*

10:10 COFFEE BREAK
Session 6
Session Chair: Tammy Dwyer

10:40 Invited Lecture (IL8)
Claudia Höbartner, Universität Würzburg, Germany
DNA catalysts and RNA aptamers for synthesis and analysis of modified RNA

11:10 Oral Presentation (OP10)
Amanda Garner, University of Michigan, USA
High-throughput platform assay technology for the discovery of pre-microRNA-selective small molecule probes

11:30 Oral Presentation (OP11)
Daniel O'Reilly, McGill University, Canada
Synergistic effects of DNA-like and RNA-like modifications in antisense oligonucleotides

11:50 Oral Presentation (OP12)
Pawan Kumar, Alnylam Pharmaceuticals, USA
Passenger strand carrying morpholino moiety at the 5’ end improves guide strand selection and RNAi activity

12:10 LUNCH BREAK

Session 7
Session Chair: Barbara Nawrot

13:20 Invited Lecture (IL9)
Amanda Bryant-Friedrich, University of Toledo, USA
Oxidative damage at a modified ribonucleic acid

13:50 Invited Lecture (IL10)
Izzat Raheem, Merck & Company, USA
HIV nucleoside reverse transcriptase translocation inhibitors (NRTTIs) for extended duration dosing

14:20 Oral Presentation (OP13)
Mélanie Etheve-Quelquejeu, University of Paris Descartes, France
Post-functionalization of RNAs for specific conjugations with peptides and proteins

14:40 Oral Presentation (OP14)
Stefan Vogel, University of Southern Denmark, Denmark
DNA and PNA programmed fusion of Lipid-Nanoreactors

15:00 COFFEE BREAK
Session 8
Session Chair: Anil Kore

15:30 Oral Presentation (OP15)
Ozlem Yaren, Foundation for Applied Molecular Evolution, USA
A multiplexed isothermal amplification platform to detect emerging pathogens

15:50 Oral Presentation (OP16)
Christian Ducho, Saarland University, Germany
Nucleoside antibiotics targeting bacterial peptidoglycan biosynthesis

16:10 POSTER SESSION (with drinks and snacks)

Wednesday, 29 August

8:00 CONTINENTAL BREAKFAST

Session 9
Session Chair: Neal Devaraj

8:30 Invited Lecture (IL11)
Shana Sturla, ETH Zurich, Switzerland
Finding the genomic Achilles’ heel with chemistry arrows

9:00 Invited Lecture (IL12)
Hiroshi Sugiyama, Kyoto University, Japan
Chemical biology of nucleic acids: DNA origami and artificial genetic switch

9:30 Oral Presentation (OP17)
Dong Wang, University of California, San Diego, USA
Transcriptional recognition principles of naturally and synthetic modified nucleic acids: from natural biology to synthetic biology

9:50 Oral Presentation (OP18)
Marcel Hollenstein, Institut Pasteur, France
Expansion of the genetic code through the enzymatic construction of artificial metal base pairs

10:10 COFFEE BREAK
Session 10
Session Chair: Piet Herdewijn

10:40  Awards Lecture (AW2)
Naoki Sugimoto, Konan University, Japan
Noncanonical world of nucleic acids under molecular crowding: To B or not to B

11:20  Invited Lecture (IL13)
Andreas Marx, University of Konstanz, Germany
Elucidating the information layer beyond the genome sequence

11:50  Oral Presentation (OP19)
Serge Beaucage, Center for Drug Evaluation and Research, FDA, USA
Solid-phase purification of synthetic DNA sequences

12:10  LUNCH BREAK

Session 11
Session Chair: Katherine Seley-Radtke

13:20  Invited Lecture (IL14)
Yves Mély, University of Strasbourg, France
Characterization of an environment sensitive nucleoside analogue, thienoguanosine, and its application for monitoring base flipping

13:50  Chu Awards

14:20  Oral Presentation (OP20)
Maksim Royzen, University at Albany, USA
Controlled in-cell activation of siRNA using biorthogonal chemistry

14:40  Oral Presentation (OP21)
Alexandre Lebedev, TriLink Biotechnologies, USA
Efficient initiation of in vitro mRNA transcription with Cap 0, Cap 1 and Cap 2 oligonucleotide primers

15:00  COFFEE BREAK
Session 12
Session Chair: Frank Seela

15:30  Oral Presentation (OP22)
Jussara Amato, University of Naples Federico II, Italy
*Development and application of high throughput screening methods for the identification of conformation-selective nucleic acids ligands*

15:50  Oral Presentation (OP23)
David Horning, Salk Institute, USA
*Toward RNA life: Synthesis and replication of RNA by RNA*

16:10  Oral Presentation (OP24)
Jesper Wengel, University of Southern Denmark, Denmark
*Novel DNA-mimicking monomers for gapmer antisense oligonucleotides*

18:00  GALA BANQUET AT BIRCH AQUARIUM
19:30  Poster Awards
Kindly sponsored by ChemGenes

Thursday, 30 August

8:00  CONTINENTAL BREAKFAST

Session 13
Session Chair: Daniela Montesarchio

8:30  Invited Lecture (IL15)
Steven Benner, Foundation for Applied Molecular Evolution, USA
*Darwinism from artificial genetic systems*

9:00  Invited Lecture (IL16)
Ichiro Hirao, Institute of Bioengineering and Nanotechnology, A*STAR, Singapore
*High-affinity and high-stability DNA aptamer generation using genetic alphabet expansion for SELEX (ExSELEX) and extraordinarily stable mini-hairpin technology*

9:30  Oral Presentation (OP25)
Nicholas Hud, Georgia Institute of Technology, USA
*Glycosylation of model proto-RNA nucleobases with various sugars: Implications for the prebiotic synthesis of nucleosides*

9:50  Oral Presentation (OP26)
John Chaput, University of California, Irvine, USA
*Structural basis for TNA synthesis by an evolved TNA polymerase*

10:10  COFFEE BREAK
Session 14
Session Chair: Roger Strömberg

10:40 Invited Lecture (IL17)
   William Lee, Gilead Sciences, USA
   *Remdesivir (GS-5734): An antiviral nucelotide analog for the treatment of Ebola virus*

11:10 Short Oral Poster Presentations (TBA)

11:50 Closing, Next IRT, Announcements

12:00 LUNCH TO GO

Poster abstracts may be found online at [http://irt2018.ucsd.edu/](http://irt2018.ucsd.edu/)