Computational Challenges in RNA-Based Gene Regulation: Protein-RNA Recognition, Regulation and Prediction

Dagstuhl , June 18-21 2017

Sunday -18.6

18:00 Dinner

19:15- Welcoming + Introduction

20:00- Get together in Dagstuhl wine cellar

Monday-19.6

Breakfast

Session 1: Technology and computational advances and challenges in studying protein-RNA interactions

9:00-9:25 Talk: Gene Yeo
Insights into large-scale protein-RNA interactions and RNA-targeting Cas9

9:25-9:50 Talk: Marcus Landthaler
Exploring global changes in protein-mRNA interactions

9:50-10:00 Short Talk: Philipp Drewe
Identification of transcriptomic regulatory elements from CLIP-Seq data

10:00-10:35 Coffee

10:35-11:00 Talk: Rolf Backofen
Determination of RNA-protein interactions

11:00- 11:25 Talk: Johannes Soeding
Mockinbird - mock-supported inference of binding sites on RNA from PARCLIP data by Bayesian modeling

11:25-11:50 Talk: Annalisa Marsico
Accurate identification of RBP binding sites and RNA sequence-structure motifs from CLIP-seq data

11:50-12:00 Short Talk: Martin Lewinski
Determination of the binding landscape of the clock-regulated RNA-binding protein AtGRP7 by iCLIP

12:15 Lunch

Session 2: Searching for new RBPs

14:45-15:10 Talk : Benedikt Beckmann
PTex - a novel method for unbiased purification of crosslinked RNPs

15:10-15:35 Talk: Andre Gerber
RNA-binding properties of a glycolytic enzyme

15:35-16:00 Talk: Yael Mandel Gutfreund
Exploring the dual binding functions of RNA binding proteins

16:00-16:30 Coffee

Session 3: Integrative analysis of protein-RNA data
16:30-16:55 Talk: Uwe Ohler
An integrated map of RNA-binding protein mediated gene regulation based on dozens of PAR-CLIP experiments
16:55-17:20 Talk: Tomaz Curk
Matrix factorization-based integrative analysis of multiple protein-RNA data sets
17:20-18:00 Discussion
Challenges in genome wide studies of protein-RNA recognition

18:00 Dinner

Session 3: Exploring the world of non-coding RNAs
19:30-19:55 Talk: Gabriele Varani
Evolution of structure and structural effect of SNPs in non-coding RNAs
19:55-20:20 Talk: Peter Stadler
ANRIL and STAIR18 - two long non-coding RNAs with atypical features

21:00- Get together in Dagstuhl wine cellar

Tuesday-20.6

Breakfast

Session 4: Inferring RNA binding specificity
9:00-9:25 Talk: Teresa Przytycka
AptaTRACE Elucidates RNA Sequence-Structure Motifs from Selection Trends in HT-SELEX Experiments
9:25-9:50 Talk: Quaid Morris
Inferring RNA motifs from millions of binding sites using billions of features
9:50-10:00 Short Talk: Daniel Maticzka
CLIPing STAR proteins: target specificity via compartmentalisation

10:00-10:35 Coffee

10:35-11:00 Talk: Frederic Allain
RNA recognition by proteins (FUS and PTB) containing multiple RNA binding domains
11:00-11:25 Talk: Michael Sattler
Decoding RNA recognition in gene regulation using integrated structural biology
11:25-11:50 Talk: Janusz Bujnicki
Flexible docking and modeling of RNA-protein complex structures

12:15 Lunch

Afternoon free until 16:30

16:00-16:30 Coffee

Session 4 continuation: Inferring RNA binding specificity
16:30-16:55 Talk: Eckhard Jankowsky
Kinetic determinants of RBP specificity in vitro and in cells
16:55-17:20 Talk: Tim Hughes
Sequence specificity of unconventional RNA binding proteins
17:20-18:00 Discussion
Structure/function principles, evolution of RNA and RBPs

18:00 Dinner

Session 5: Studying the effect of sequence and structure changes on RNA expression
19:30-19:55 Talk: Irmtraud Meyer
Alternative RNA structure expression and its functional roles
19:55-20:20 Talk: Grzegorz Kudla
RNA genotype-phenotype mapping

21:00- Get together in Dagstuhl wine cellar

Wednesday – 21.6

Breakfast
Session 6: RBPs and small RNAs
9:10-9:35 Talk: Hanah Margalit
Large-scale elucidation of RNase III targets and cleavage patterns
9:35-10:00 Talk: Guido Sanguinetti
Modelling the RNA-life cycle from chi-CRAC data

10:00-10:35 Coffee

10:35-11:00 Talk: Andres Ramos
RNA recognition in Syncrip-mediated exosomal loading of miRNAs
11:00-11:25 Talk: Hilal Kazan
Modeling the combined effect of RBPs and miRNAs in post-transcriptional regulation

11:25-12:00 Discussion +Summary

12:15 Lunch and Departure