DNA habitats and its RNA inhabitants

3 - 5 July 2014 Salzburg - Austria

Viruses, Mobile Genetic Elements, Viroids, Introns, Ribozymes and other RNAgents

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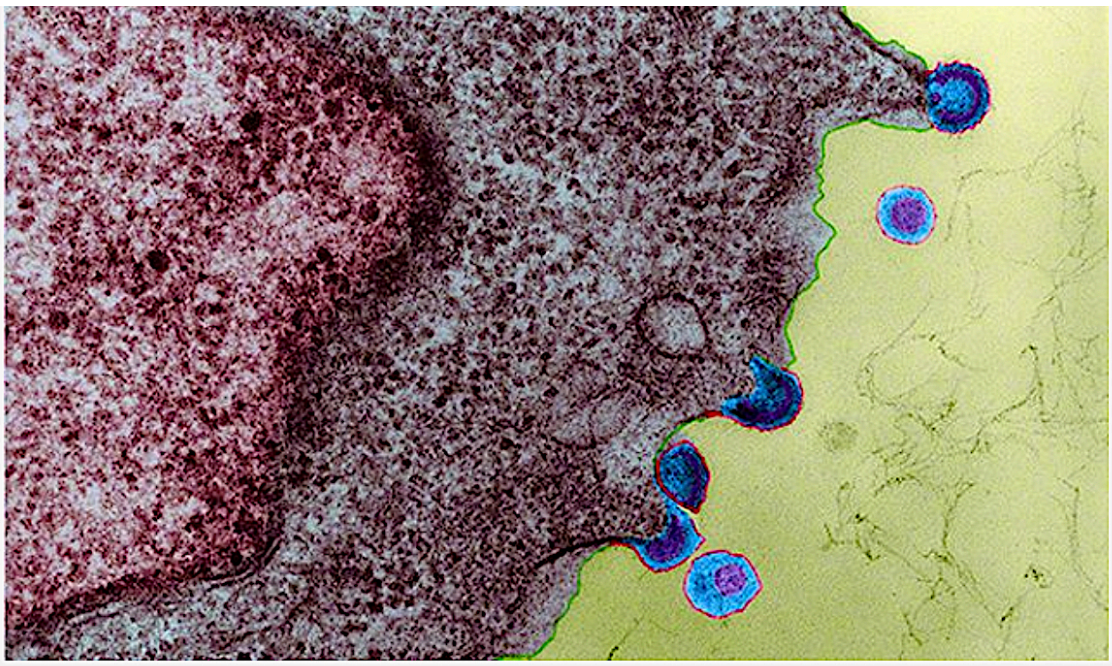

HIV infection in lymph tissue. Image copyright Dennis Kunkel Microscopy, Inc. >

DNA Habitats and its RNA Inhabitants

The shifting perspective from a read-only-memory genome with copying errors to a read-and-write genome with competent change operators is fundamental: For decades it was assumed that driving force of evolution is mutation (error) and selection. Now it is recognized that errors cannot explain genetic novelty and complexity.

A variety of RNA based agents play essential roles in evolution and regulation in all DNA/Protein based life: basic non-coding RNA secondary structures built of (paired) stems and (not-paired) loops. RNA stem-loop swarms such as group I introns, group II introns, viroids, viral (RNA viruses, retrotransposons, LTRs, non-LTRs) and subviral networks (SINEs, LINEs, Alus) cooperate within cellular genomes as modular tools with its abundance of regulatory functions. Some noncoding RNAs built complementary consortia such as rRNAs, tRNAs, spliceosomes, editosomes, and other RNPs. Additionally counterbalancing modules such as toxin/antitoxin (TA) -, restriction/modification (RM) -, and insertion/deletion (INDEL) – modules assure identity (self/non-self) of cells, tissues, organs and even organisms.

Infectious RNAgents manipulate host genomes for (i) selfish replicative purposes or (ii) persistent co-evolutionary integration. The latter in most cases remain as defectives,

i.e. abundance of parts that now serve as co-opted modular tools for cellular needs or as full function elements that regulate complex developmental processes such as placentation in mammals. Also mixed consortia of RNA- and DNA virus-derived parts that integrate in host genomes have been found.

All fine-tuned steps and substeps of key cellular processes such as gene expression, transcription, translation, DNA recombination and repair, epigenetic imprinting (memory, learning), as well as various forms of innate and adaptive immunity are essentially constituted by such natural genetic content operators.

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Program

+

Book of Abstracts

www.rna-agents.at

Kulturelle Sonderprojekte Land Salzburg

The New York Academy of Sciences

RNA Society

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Abstracts

Talks

and

Posterpresentation

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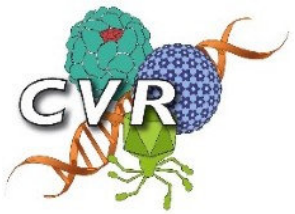
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E-Mail: office@virgil.at

Wednesday, July 2, 2014

12:00 - 20.00	Registration at St. Virgil
18:45	Welcome drink and warm reception by the organizer and partners

Thursday, July 3, 2014

8:45 Organisation Affairs !

9:00 - 9:30 Guenther Witzany
Introduction: Natural Codes do not code themselves

9:30 – 10.00 Eugene Koonin
Giant viruses and domains of life

10:00 – 10:30 Luis Villarreal
Viral consortia: A social force for ancient and recent life

Coffee Break – Tea Time (20 minutes)

11:00 – 11:30 David Prangishvili
Viruses from the dawn of life

11:30 – 12:00 Mart Krupovic
Evolutionary continuum between small RNA and DNA viruses

12:00-12:30 Valerian V. Dolja
Capsid-less and non-infectious viruses are integral to the Virus World

Lunch

13:45 – 14:30 Ricardo Flores
Viroids: filling the lower size niche for RNA genomes

14:30 – 15:00 Aare Abroi
Impact of (RNA) viruses on the genesis of cellular protein domain repertoire

Coffee Break – Tea Time (20 minutes)

15:20 – 16:20 POSTER Presentations

16:30 – 17:00 Sabine Mueller
Engineering of ribozymes with useful activities in the ancient RNA world

17:00 – 17:30 Gustavo Caetano-Anólles
Untangling the cellular origin of viruses

17:30 – 18:00 Eörs Szathmáry
Dynamical questions of the early RNA world

Dinner

Friday, July 4, 2014

8:45 Organisation Affairs !

9:00 – 9:30 Lennart Randau
Small RNA genes mediate genome rearrangement events in Archaea

9:30 – 10:00 Matti Jalasvuori
Patterns in genomic chaos: bacterial cells as vehicles of war in genetic struggle for existence

10:00 – 10:30 Mariusz Nowacki
RNA-mediated genome sculpting in ciliates

Coffee Break – Tea Time (20 minutes)

10:50 – 11:30 John Mattick
RNA at the epicentre of the evolution and development of complex organisms

11:30 – 12:00 Marilyn Roossinck
Persistent viruses in plants and fungi: molecular fossils

12:00 – 12:30 Eric A. Miska
Social RNA: update from invertebrates

Lunch

13:45 – 14:30 Robert Gifford
Endogenous retroviruses and the generation of genetic diversity in mammals

14:30 – 15:00 Frederick Arnaud
The evolutionary interplay between endogenous and exogenous sheep retroviruses and their host

Coffee Break – Tea Time (20 minutes)

15:20 – 16:20 POSTER Presentations

16:30 – 17:00 Keizo Tomonaga
Bornavirus infection: a unique life style of an animal RNA virus in the DNA habitat

17:00 – 17:30 Erez Levanon
DNA and RNA editing of mammalian retrotransposons

17:30 – 18:00 Joan Curcio
Host co-factors of retrotransposon RNA localization to nucleocapsid assembly sites

18:50 Congress Dinner with Music Performance

Saturday, July 5, 2014

8:45 Organisation Affairs !

9:00– 9:30 Karin Moelling
Reverse Transcriptase and RNase H

9:30 – 10:00 Juergen Brosius
3.8 billion years of RNA

10:00 – 10:30 Kevin Weeks
Towards an RNA structure of everything

Coffee Break – Tea Time (20 minutes)

10:50 – 11:30 Eric Westhof
Constraints and Limits due to Base Tautomerism in Recognition Fidelity

11:30 – 12:00 Peter Unrau
A bright, high affinity, RNA aptamer-dye complex suitable for in vivo RNA tracking

12:00 – 12:30 Andreas Werner
Endo-siRNAs from natural antisense transcripts

Lunch

13:45 – 14:30 Steinar Johansen
Role of self–splicing introns beyond RNA splicing

14:30 – 15:00 Harald Brüssow
Modulation of gut microbiota by oral bacteriophages and nutritional interventions: insights from human intervention trials

Coffee Break – Tea Time (20 minutes)

15:20 – 16: 20 POSTER Presentations

16:30 – 17:00 Corrado Spadafora
Retroelements in embryonic development, tumorigenesis and evolution

17:00 – 17:30 Ravindra Singh
A unique RNA structure that paved the way for the treatment of a leading genetic disease

17:70 – 18:00 Minoo Rassoulzadegan
RNA mediated heredity of an acquired pathology

Dinner

Sunday, 6th July

Sunday-Excursion half day to an extraordinary place near Salzburg: Hellbrunn
(30 Euros including: transfer, guided tour and meals)

Detailed Programm will be published after receipt of the abstracts (June 2014)