

Posttranscriptional Control of Gene Expression in Eukaryotes

Overview

In eukaryotes, gene expression may be controlled or regulated in many ways. While the initiation of transcription is certainly a central point for regulatory decisions, gene expression is often (usually) controlled by other mechanisms as well. Many of these mechanisms involve the synthesis, processing, and functioning of the messenger RNA. This multiplicity of mechanisms lends itself nicely to the matter of regulation, in that they afford the cell several points at which inputs (derived from cellular signaling pathways) may affect the overall expression and/or functioning of the mRNA.

This course will provide a background in concepts and will include an overview of current experimental approaches that are used to study aspects of posttranscriptional regulation. Upon completion of the course, participants will:

1. Be familiar with the current state of knowledge of mechanisms of mRNA biogenesis, processing, functioning, and turnover.
2. Understand the methodology behind the advances and current study of posttranscriptional control mechanisms.
3. Be cognizant of the theoretical underpinnings of the field.
4. Be able to formulate and test hypotheses that pertain to the role(s) that posttranscriptional control may play in gene expression.

Course Outline

<u>Modules</u>	<u>Lecture topic</u>	<u>Associated laboratory exercises</u>
20.02.2017	Background– the importance of posttranscriptional control from a theoretical perspective	Accessing high throughput sequencing data
21.02.2017	The lives of an mRNA	qRT/PCR demonstration and discussion
22.02.2017	Alternative RNA processing: outcomes, mechanisms, and regulation	RNA-Seq library preparation
23.02.2017	RNA quality control and surveillance	RNA-Seq library preparation
24.02.2017	The Small RNA World	Analyzing high throughput sequencing data
25.02.2017	Posttranscriptional control in context – integration into regulatory networks	Analyzing high throughput sequencing data

<p>Intended audience for this course:</p>	<ul style="list-style-type: none"> • Student at all levels (B.Sc./MSc/MTech/PhD) of Life sciences including Biotechnology, Biochemistry and molecular biology, Botany, Microbiology, Human genetics, Zoology etc. • Faculty from reputed academic institutions and technical institutions. • Researchers /Post-doc/ Research associate from Universities, Govt. and R&D laboratories.
<p>Fees</p>	<p>Participants from abroad: US \$ 200</p> <p>Industry/ Research Organizations: Rs. 5000/-</p> <p>Academic Institutions:</p> <p>BSc Students: Rs. 500/-</p> <p>MSc Students: Rs. 1000/-</p> <p>PhD Students: Rs. 1500/-</p> <p>Faculty members: Rs. 2000/-</p> <p>There will be no required textbook. Participants will be expected to read and understand selected review articles appropriate for the modules listed above. Additional research papers will be assigned to emphasize particular points of interest.</p> <p>The fee covers all instructional materials, computer use for tutorials, and 24 hr free internet facility. The participants will be provided with single bedded accommodation on payment basis.</p>

The Faculty



Dr. Arthur Hunt is a University Research Professor in the Department of Plant and Soil Sciences at the University of Kentucky. His laboratory is recognized as an international leader in the area of messenger RNA 3' end formation and polyadenylation in plants. For than more than 30 years, he has studied this topic, using a multifaceted range of experimental and computational approaches. More recently, he has pioneered the use of high throughput DNA sequencing for the study of mRNA polyadenylation. He has developed very useful laboratory methods and computational tools for this, and has established a wide-ranging and important role for alternative polyadenylation in numerous plant growth processes. He has also developed very low-cost methods for the production of transcriptomics (RNASeq) libraries and has helped numerous laboratories throughout the world in adding RNASeq to their research repertoires.



Prof. (Dr.) Pratap Kumar Pati is the faculty in the Department of biotechnology, Guru Nanak Dev University. The research interest is in the area of plant biotechnology. Presently the host faculty is working deciphering strategies for abiotic stress tolerance in rice and improvement of high valued medicinal plants. The host faculty is involved in phytohormone mediated stress tolerance, cloning and characterization of critical genes, transcription factors conferring stress tolerance in *Oryza sativa* and *Withania somnifera*. Beside this, insights into root development in rice and the role of root architecture in abiotic stress amelioration is being explored in the lab. Various tools including phenotype studies, plant tissue culture, genetic transformation, Physiology and biochemistry, genomics and proteomics are being utilized.

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REGISTRATION CUM ACCOMODATION REQUEST
FORM

(To reach electronically by xxx and hard copy by xxx)

INTERNATIONAL WORKSHOP on Posttranscriptional Control of Gene Expression
in Eukaryotes

Feb. 20-25, 2017

Department of Biotechnology, Guru Nanak Dev University
Amritsar, Punjab

Name (Block Letters): M/F:

Designation/ Professional Title:

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Organization:

Address:

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Tel.: Mobile: E-

mail:

Accommodation Required (Yes/ No):

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The Registration fee of Rupeeshas been paid via Demand
Draft

No.....in favour of The Registrar, Guru Nanak Dev University, Amritsar Through
online/offline banking bearing Transaction No. to Punjab & Sind Bank, Guru Nanak Dev University Campus
(RTGS/IFSC code: XXX) A/Ct No. XXX of Guru Nanak Dev University. Demand Draft/ Fee Receipt have been enclosed
herewith.

Date: Signature