“Adventures in Eukaryotic Gene Expression: Transcription, Splicing, Polyadenylation, and RNAi”

Morning Schedule, 8:30 a.m. – 1:15 p.m.

8:30 Breakfast

9:00 Steve Buratowski: Welcome/Retrospective

9:15–10:05 Pierre Chambon: "Genetic dissection of retinoid signaling through cell-specific, temporally-controlled targeted mutagenesis"

10:15–10:35 Melissa Moore: "The exon junction complex"

10:35–10:55 Claire Moore: "Novel connections between the mRNA 3' end processing, transcription, and export machineries"

10:55–11:10 Coffee Break

11:10–11:30 Ben Shykind: "One cell, one receptor: generating neuronal diversity in the olfactory system"

11:30–11:50 Lewis Chodosh: "Breast cancer reversibility and progression"

11:50–12:10 David Fisher: "From MLT to human cancer"

12:10–12:30 Richard Carthew: "Genes and biological complexity"

12:30–12:50 Tom Tuschl: "Biochemical analysis of mammalian RNA silencing mechanisms"

12:50–1:00 Phil Sharp: Closing remarks

Afternoon Alumni Poster Session, 3–6 p.m.

Minou Bina: Locating the control elements in human DNA

Myles Brown: New rules for steroid receptor coregulators

Steve Buratowski: Connecting transcription with miRNA processing and chromatin

Christopher Burge & Zefeng Wang: Exonic silencers of splicing

Chonghui Cheng: Signal transduction and alternative splicing

Gilbert Chu: Transcriptional responses to DNA damage predict toxicity from radiation therapy

Richard Condit: Vaxinia virus transcription elongation

John Doench: Specificity and mechanism of microRNAs

William Fairbrother: Exonic splicing enhancers

Andrew Fire: Molecular warning lights: three "unwanted" nucleic acid structures that trigger genetic silencing

Paula Grabowski: Splicing decisions, neurons, and G clusters

Alla Grishok: miRNA pathway genes and cell division in C. elegans

Hristo Houbaviy: Embryonic stem cell-specific microRNA cluster

Myles Brown: miRNA pathway genes and cell division in C. elegans

Jørgen Kjems: Role of TFR RNA in HIV-1 dimerization

Magda Konarska & Charles Query: Equilibrium between spliceosome conformations controls fidelity of pre-mRNA splicing

Thomas Kristie: HCF-1 control of HSV lytic and latent cycles

Frank Laski: Regulation of Drosophila development

Rachel Meyers: Towards the development of an siRNA therapeutic

Claire Moore: Polyadenylation: beyond the basics

Rick Padgett: Splicing in a minor key

Jeff Purvine: Breast and ovarian specific tumor suppressor BRCA1

Chris Petersen: Mechanism of microRNA silencing in mammals

John Sedivy: MYC targets and senescence

Ben Shykind: Generating neuronal diversity in the olfactory system

Dean Tantin: Oxt protein function in and out of the immune system

Anders Virtanen: Poly(A)-specific ribonuclease: connecting the mRNA 5' and 3' ends

Highlights of research from the Sharp lab and 5th floor accomplishments in the course of 30 years

1974–1979: The early years: transcripts, splicing, and introns

Phil Sharp starts his lab on the 5th floor of the newly established Center for Cancer Research. The long corridors connect his lab with the labs of Baltimore, Weinberg, Hopkins, and Housman; Baltimore wins the Nobel Prize for the discovery of the enzyme reverse transcriptase; the Sharp lab discovers gene splicing; recombinant DNA research becomes a controversial issue; Sharp cofounds Biogen

During these five years the Sharp lab
• explores splicing in adenoviruses
• discovers techniques for mapping segments of adenoviruses and retroviruses


The Weinberg lab discovers the first human oncogene; the Baltimore and Weinberg labs move to the newly established Whitehead Institute; Sharp becomes Director of the CCR

During these five years the Sharp lab
• continues with studies on transcription and splicing; requirements for splicing are elucidated
• develops an in vitro system for splicing with identification of lariat RNA, spliceosome
• develops model systems for gene expression
• develops in vitro systems for transcription and polyadenylation reaction


The Housman lab isolates the gene for Wilms' tumor and, in collaboration with others, finds the genes responsible for Huntington's disease and myotonic dystrophy; Sharp wins the Nobel Prize for split genes and becomes Head of the Biology Department

During these ten years the Sharp lab
• isolates the factors involved in gene expression and transcription
• further elucidates mechanisms and requirements for splicing, transcription, and polyadenylation

1995–2004: New approaches and RNAi

The 5th floor welcomes Tyler Jacks, Jackie Lees and Michael Yaffe; Sharp becomes Director of the McGovern Institute and cofounds Alnylam

During these nine years the Sharp lab
• works on interaction of splicing factors and enhancers
• works on computational biology with prediction of enhancers and evolution of U12 introns
• examines the biochemistry of RNAi mechanisms and microRNA activity