

# “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*  
9:15–10:15 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 MLTF to human cancer”*  
12:10–12:30 Richard Cartthew: *“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 roles for steroid receptor coregulators*  
Steve Buratowski: *Connecting transcription with mRNA 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: *Vaccinia 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*  
Jørgen Kjems: *Role of TAR 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 Parvin: *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: *Oct 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 5<sup>th</sup> floor accomplishments in the course of 30 years

1974–1979: *The early years: transcripts, splicing, and introns*  
Phil Sharp starts his lab on the 5<sup>th</sup> 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

- observes splicing in adenoviruses
- discovers techniques for mapping segments of adenoviruses and retroviruses

1980–1985: *Biochemistry of gene expression*

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

1985–1995: *The machinery of transcription and splicing*

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

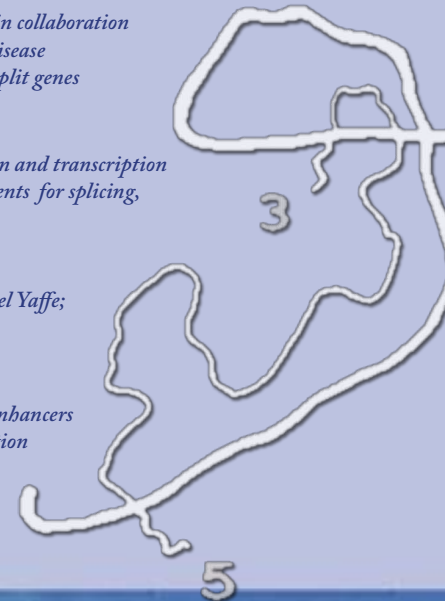
- isolates the factors involved in gene expression and transcription
- further elucidates mechanisms and requirements for splicing, transcription, and polyadenylation

1995–2004: *New approaches and RNAi*

The 5<sup>th</sup> 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



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