8:30 Coffee—CP Room 137

9:00 Welcome and Introduction—CP Room 139

9:15 STRUCTURE AND EXPRESSION OF INTERVENING SEQUENCES IN EUCARYOTIC GENOMES
—Dr. Benjamin Lewin—

The recent discovery of interruptions in eucaryotic genes has made it necessary to discard the concept of the gene as a contiguous length of DNA that is colinear with its product. Intervening sequences have been characterized in nuclear and organelle genes of many eucaryotic species; their locations in related genes may show their origin to be distant in evolution. The intervening sequences are transcribed but are spliced out of the primary transcript to produce a messenger RNA whose sequence is colinear with protein. In instances in which several intervening sequences must be removed, discrete intermediate precursors may be found. This provides a new mechanism for the processing of giant nuclear RNA. Alternative pathways of RNA splicing exist in some viral systems, so that overlapping products are generated from a single length of DNA. Transposition of sequences in cellular DNA has been found in certain situations. The genetic implications of this organization will be discussed.

10:20 Discussion and Coffee Break

10:40 ROLE OF RNA PROCESSING IN THE SYNTHESIS OF mRNAs
—Dr. Phillip A. Sharp—

The structure of mRNAs of viruses of animal cells has shown that RNA processing plays a critical role in the expression of genetic information in these systems. In general, several mRNAs are processed by RNA splicing from one transcription unit and these RNA species have similar sequences at both termini. The time course of synthesis and phenotypes of RNA synthesis in mutant-infected cells suggests that RNA splicing can be regulated. These data will be discussed in terms of our current understanding of the biochemistry of RNA splicing and the sequence of the RNA products.

The first step in further defining the components involved in excising intervening sequences and joining RNA sequences coding for a polypeptide is to develop an *in vitro* system capable of carrying out this reaction. An *in vitro* system which synthesizes the correct 5′ and 3′ termini for adenovirus RNA has been developed. This will be discussed in terms of a hypothetical pathway for synthesis of mammalian mRNAs.

11:45 Discussion

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established in memory of
ANNA S. NAFF

Interrupted Genes and RNA Splicing

Speakers
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