LS 567 Eukaryotic Gene Expression

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1.	Gene expression in eukaryotes: an overview	KN/1
2.	Eukaryotic gene structure, Initiation of transcription by RNA polymerase and transcription machinery.	RM/1
3.	Modification of chromatin structure and activation of gene expression	RM/2
5.	Regulatory cis elements, various modes of binding of transcription factors to those elements, concept of weight matrix.	RM/1
6.	Enhancers, Enhancer RNAs (eRNAs) and gene regulatory network	RM/1
7.	Long non-coding RNAs in gene regulation	RM/1
8.	Genome-wide transcription and its role in gene regulatory network	KN/1
9.	Various families of gene regulatory proteins: helix-turn-helix, helix-loop-helix, homeodomain, leucine zipper and Zn family of transcription factors.	RM/1
10.	Histone modifications and chromatin structure	RM/1
11.	Histone modifying enzymes and transcription	RM/2
12.	Mapping chromatin structure	RM/1
13.	Genome-wide chromatin maps and Histone Code	RM/1
14.	Co-transcriptional and Post-transcriptional events in gene expression	KN/2
15.	Co-transcriptional and Post-transcriptional events in gene expression	KN/2
16.	Translational control of gene expression	KN/2
17.	Ribosome profiling assays to study translationally regulated mRNAs	KN/1
18.	Integration of extracellular signals to the transcription machinery	KN/1
19.	Diversification of cellular proteome by differential splicing	KN/1
20.	Small regulatory RNAs and their role in gene regulation	KN/1

Suggested Reading:

1. Principles of genome Analysis and Genomics : SB Primose and R M Twyman
2. Molecular Biology of the Cell : Alberts et al
3. Genes X by Lewin
4. Reviews/research articles