

## BICH/GENE 431 KNOWLEDGE OBJECTIVES

### Chapter 20 – Genomics and Systems Biology

Annotation of genome sequences

Transcriptome

Using tiling microarrays – what is a tiling array? How does a tiling array help determine the transcriptome?

What is a BLAST search?

Finding enhancers

- How is comparative genomics used to help identify enhancers?
- What is the ChIP-chip assay? How does it work and help identify enhancers?

Noise in gene expression; stochastic phenomenon; what is an example?

Intrinsic vs. extrinsic noise

What is systems biology?

Simple gene regulatory networks

- positive input (activator)
- negative input (repressor)
- two input nodes and AND gate – example is E. coli lac promoter with CAP/cAMP and lac repressor
- positive autorepression vs. negative autorepression – what are effects on kinetics of induction in each case
- feed-forward networks – coherent vs. incoherent; what are differences in type of control for these two cases (delay, or pulsed expression)