CHAITAN KHOSLA: AN INTRODUCTION TO POLYKETIDE ASSEMBLY LINES

Part I: Lecture Review

Part 1

1. What are polyketides and why are they important?

2. What is significant about the way polyketides are synthesized? How might such a system be useful? Do you know of any other biosynthetic pathways with similar properties?

3. What do all polyketide assembly lines have in common? What implication does this have for the study of polyketide assembly lines?

4. Why could it be useful to understand the individual components of polyketide biosynthesis assembly lines?

5. What techniques have been used to analyze the structures of the modules of polyketide assembly lines? How could structural models be useful?

Part 2

1. What is a vectorized process? Compare a vectorized process with a non-vectorized process.

2. Where and how is specificity generated in assembly lines?

3. What does it mean to refactor metabolic pathways?

Part 3

1. How is directionality established in the polyketide synthesis pathway? Are their biosynthetic pathways that have no directionality?

2. What prevents backward movement of the growing polyketide chain in the biosynthetic pathway?

3. How are products passed to the correct downstream module?

4. What did he mean when he mentioned engineering a “stutter” into the assembly line? What was the result of this and what did it indicate about production of polyketides?

Part II: Paper Review

1. What was the overall goal of this research? Why would achieving this goal be useful?

2. How are the experiments shown in figures 2A and 2B similar? What is different about them?

3. Describe the experimental set-up depicted in Figure 3. What are the two main results from this experiment?

4. What is the point of making the different mutations shown in Figures 4C and D? How do these mutations affect the DEBS modules, and how is this useful?

5. What traits of *E. coli* are important for the *in vivo* chain extension reactions using fluoromalonyl-CoA?