

MIT Chemical Engineering Department
Fall 2017 Seminar Series

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Novel insights into understanding and designing regulatory RNAs



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3:00pm, refreshments at 2:45pm

66-110

Abstract:

Global regulators enable the response to diverse and rapidly changing environmental stimuli in living systems by affecting vast networks of targets at, frequently, multiple biological levels. For this reason, there is ample interest in tuning their regulation for strain engineering. Specifically, bacterial small RNAs (sRNAs), a class of RNA regulators, exert dynamic control on complex networks by regulating gene expression. Given the importance of understanding molecular structure and the targetome to RNA functioning, RNA engineering efforts depend heavily on the design of specific shapes and retargeting of specific binding partners. In this talk, we will describe the development of novel high throughput probing tools that allow for the in vivo characterization of sRNAs interacting interfaces and molecular targets. We will describe the design of these synthetic probing approaches and will showcase the potential of this method by presenting novel fundamental insights obtained for large collections of bacterial sRNAs. The talk will also highlight our use of these methods for the rational design of bacterial sRNAs to achieve a tunable gradient of global control for metabolic engineering applications.