

Synthetic Solutions to Drug Resistance

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Abstract Synthetic biology has the potential to revolutionize human health standards. Advances in molecular and cellular biology, computational science, and systems biology have contributed to this new field that is trying to apply engineering principles to answer biological questions. These applications of synthetic biology may bring hope to our battle against the ever-emerging drug-resistant forms of disease. Advances in medical science helped us to achieve early victory against various common diseases in the last century. However, newer forms of drug-resistant diseases have emerged and are threatening the human race immensely. To fight this challenge, several strategies have been adopted to various degrees of success. For some diseases such as cancer, tuberculosis, HIV/AIDS, malaria, and diabetes, the threat is still imminent. This chapter discusses the early efforts of synthetic biologists toward better management, wherein we summarize some of the very recent work in the field. We hope the arsenal of synthetic solutions will provide superior solutions toward early diagnosis and treatment of drug-resistant disease forms.

1 Introduction

One of the main features of any living cell is adaptability to survive. Every living organism on the earth adapts strategies to grow and dominate the environmental challenges. Therefore, it is no surprise that the acquired drug resistance is possibly a

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