

RNA logic gates

Daniel Svane

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1 Introduction

Logic circuits using DNA and RNA has many interesting applications in diagnostics and treatment. An example is cancer detection, where miRNA's can be used as biomarkers [2]. These biomarkers can be used as inputs for logic circuits, which can be designed to activate FRET signals [3] or enzymes [1] when combinations of biomarkers are present or absent. For example, a circuit could be designed to activate when 2 unique miRNA's are present at the same time, or when a certain protein is present. This is represented schematically in figure 1.



Figure 1: Example of logic circuit

The logic gates can be made using strand displacement [4], where the outputs of one gate can be linked to the input of another by unique DNA or RNA sequences.

References

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