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Abstract

Self-assembling tiles have been used to for computing based on the model of Wang tiles previously. To compute Boolean Functions, the system of DNA tiles has to be modified so that in addition to the 0 and 1 encoded in the tile's sticky ends, there is a function reporter such as AND or OR. This has been accomplished by using tiles with four sticky ends and a middle label. The computing is carried out on a DNA template where the middle label matches to a pawn of the correct expression and the tiles self-assemble based on the pawn and the sticky ends of tiles in preceding rows. This is shown in a template assembled for a specific function, but the opportunity exists to make a programmable standard template. Additionally, the methodology could be expanded to 3D in order to carry out more complex computations with more functions.

Specify the distinction between template +
computing levels.

idea of universality.

~~also~~ Mention actual DNA motifs to be used/example tiles.
