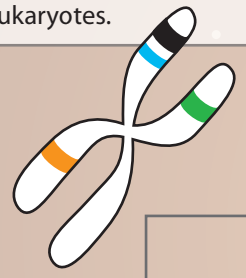
Heidelberg iGEM Team: graphical abstract

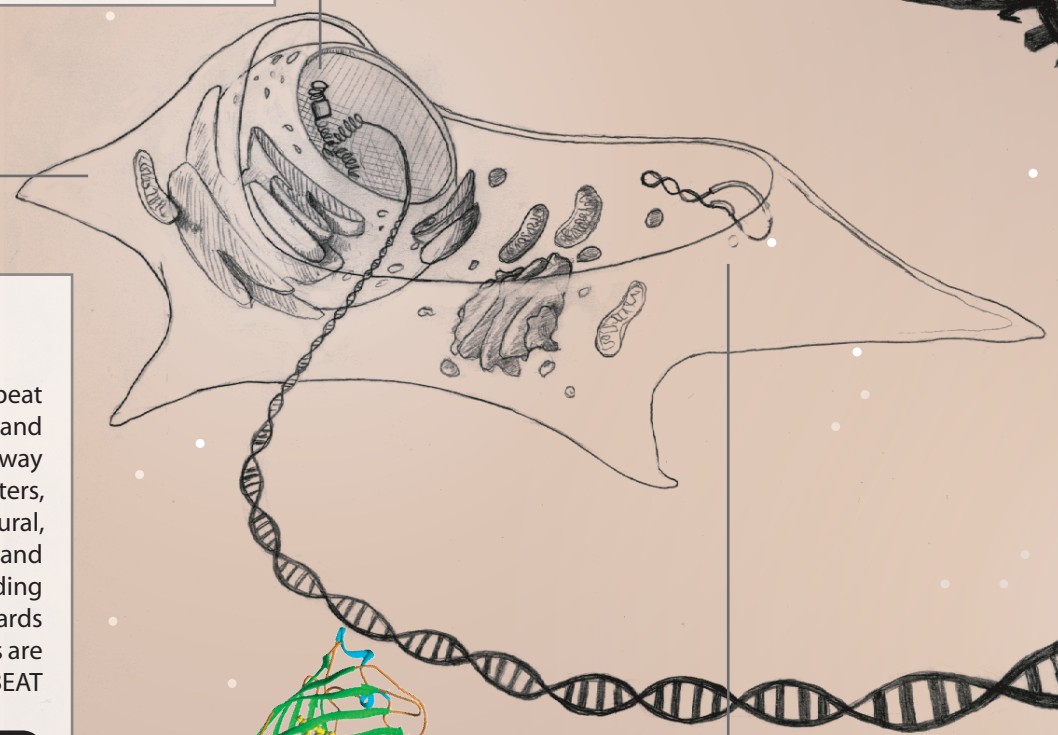
Standard Integration Site

Our experiment showed that it is possible to generate cell lines with stable FRT sites. We are aware that our cell lines with multiple FRT sites are not ideal for the characterization of promoters. Nevertheless, we are convinced that a cell line that contains a single integration site can be generated and that it would be very valuable for standardized characterization of BioBrick parts in eukaryotes.



Experimental Validation

We successfully designed promoters for SREBP and could experimentally validate their specific induction.



HEARTBEAT

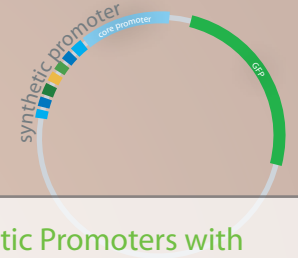
We assembled a novel database on the positional distribution of 300 transcription factor binding sites, derived from 4500 human promoters. The database is then used to design new and specific promoters - we call them Spybricks! We have implemented a GUI to give everybody the chance to design own promoters.

Fuzzy Logic Network Modelling

To complement our Heartbeat DB with experimental data and simulate combined pathway activation by several promoters, we measure and model natural, randomly assembled and designed promoters according to our measurement standards with Fuzzy Logic. The results are fed back into the HEARTBEAT DB.

Standard Measurement Plasmid

We have introduced two new measurement units on the mRNA and protein level. We recommend a standardized and replicative measurement procedure to enable and facilitate data transfer and comparison. Read more in the Measurement section of our project.



Synthetic Promoters with RA-PCR

We developed a new method to randomly assembly certain transcription factor binding sites based on PCR (RA-PCR). It enabled us to generate an exhaustive library of promoters with varying transcription strength.

Experimental Validation

We experimentally proofed to have generated constitutive promoters that exceed JET in their strength.

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09 SPYBRICKS FOR YOUR EYES ONLY