Free Genes Twist Order 6

Wajid Waheed, Connor Tansley, Ekam Dhaliwal, Scott Pownall,

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1 Bovine Kappa Casein

Bovine Kappa Casein
Location: Specific to mammary gland, secreted outside cell membrane to milk
Function: stabilizes micelle formation and prevents casein precipitation in milk
http://www.uniprot.org/uniprot/P02668
- Sequence Translated from amino acids to nucleotides through IDT using Yeast optimization
Why Milk Proteins? With a growing population, the demand for consumption of animal products will also continue to rise. There are sustainability issues for the land requirements needed for cows. The purpose of these genes is to produce them through Yeast (Saccharomyces cerevisiae) and test whether there is any potential in producing these animal proteins (complete in essential amino acids) efficiently and sustainably through bioengineering organisms like Yeast.)

1.1 Author

Ekam Dhaliwal, Scott Pownall,scott@opensciencenet.org

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3 Bovine Casein Kinase FAM20C

Bovine Casein Kinase FAM20C
For phosphorylating casein proteins FAM20C
Bovine form, Predicted protein and not experimentally confirmed.
http://2014.igem.org/Team:SF_Bay_Area_DIYbio/Parts#Casein_Kinase
http://www.uniprot.org/uniprot/F1MXQ3
Sequence Translated from amino acids to nucleotides through IDT using Yeast optimization.

3.1 Author

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4 Apoaequorin optimized for plants

Apoaequorin CDS codon optimised for plants without the first 7 amino acids. patents in other jurisdictions but not Europe.

4.1 Author

Connor Tansley,c.tansley@uea.ac.uk

5 Clarkia breweri S-Linalool Synthase

Clarkia breweri S-Linalool Synthase
Function: Fragrant terpene part of the sweet scent of flowers
Reaction: Geranyl diphosphate + H2O = (3S)-linalool + diphosphate.
http://www.uniprot.org/uniprot/Q96376
Sequence Translated from amino acids to nucleotides through IDT using Yeast optimization
Why? A fragrance is easy to detect which is good for biolabs lacking expensive measuring instruments. The gene can be used as a practicing tool for beginners in synthetic biology. Yeast has an inherent terpene synthesis (MVA) pathway.

5.1 Author

Ekam Dhaliwal, Scott Pownall,scott@opensciencenet.org

6 Oscimum basilicum Gernaiol synthase

These two genes belong to the iridoid pathway in Picrorhiza kurrooa- a highly endangered medicinal plant. In order to engineer heterologous hosts to produce a synthetic biology platform for producing picrosides, I have selected two genes to test the functionality fo a novel P. kurrooa P450 and engineer N. benthamiana to produce picrosides.

6.1 Author

Wajid Waheed,bhatwaji@msu.edu

7 Mentha aquatica R-linalool synthase

Mentha aquatica R-linalool synthase
S-Linalool has olfactory threshold at 7.4 ppb whereas R form has 0.8 ppb. R-Linalool production is an enantiomer of S-Linalool.
Function: Main component of lavender essential oil
Location: Produced in the cytoplasm
http://www.uniprot.org/uniprot/Q8H2B4
Sequence Translated from amino acids to nucleotides through IDT using Yeast optimization.
*** IDT message: This sequence contains the following complexities that may prevent ordering: "This sequence contains a window of 150 bases starting at base 354 with a GC content of 34.7%. Solution: Redesign this region to have a GC content greater than 35%.
Why? A fragrance is easy to detect which is good for biolabs lacking expensive measuring instruments. The gene can be used as a practicing tool for beginners in synthetic biology. Yeast has an inherent terpene synthesis (MVA) pathway.

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8 Picrorhiza kurrooa geraniol 10-hydroxylase

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