Phase #1
HOST Selection

Note: *Choose the host according to its DEGREE OF MANIPULATION*

Bacillus subtilis (B. subtilis)

ID: 1006

DEGREE OF MANIPULATION: Very easy

SUCCESS RATE : 89%

BASE PRICE : Rs. 4,700

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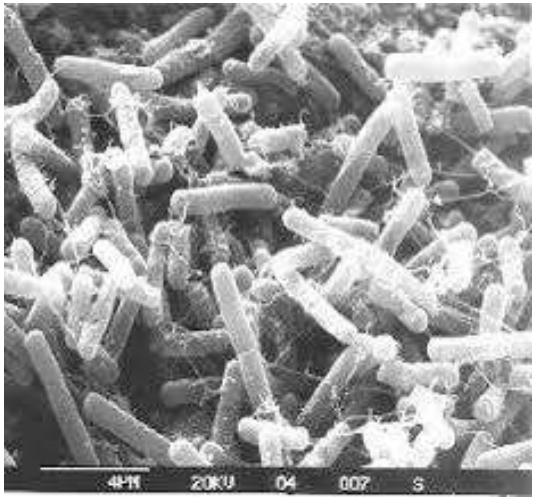
Clostridium acetobutylicum (C. acetobutylicum)



ID: 1004

DEGREE OF MANIPULATION: Cumbersome

SUCCESS RATE : 64%

BASE PRICE : Rs. 2,800

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Pseudomonas putida (P. putida)

ID: 1003

DEGREE OF MANIPULATION: Easy

SUCCESS RATE : 80%

BASE PRICE : Rs. 3,800

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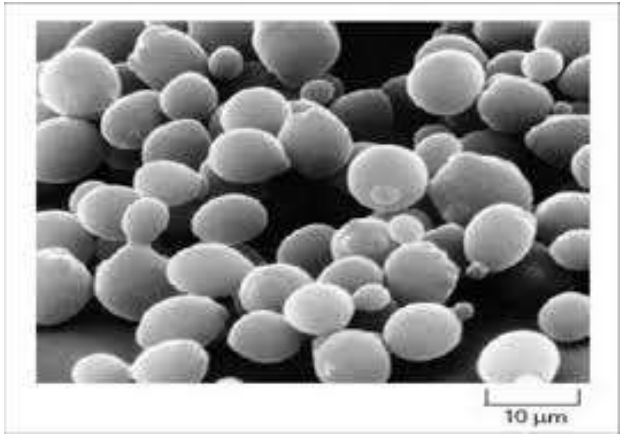
Saccharomyces cerevisiae (S. cerevisiae)



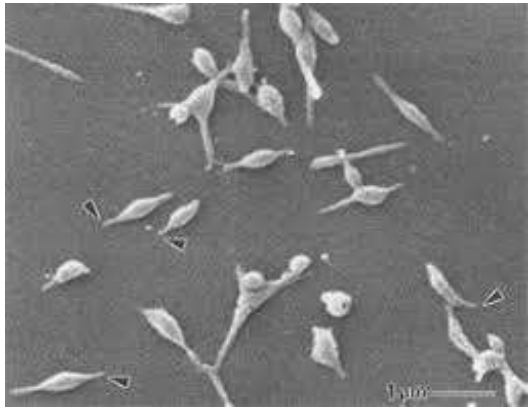
ID: 1005

DEGREE OF MANIPULATION: Difficult

SUCCESS RATE : 40%

DEFAULT

Mycoplasma pneumoniae (M. pneumoniae)



ID: 1002

DEGREE OF MANIPULATION: Cumbersome

SUCCESS RATE : 67%

BASE PRICE : Rs. 3,000

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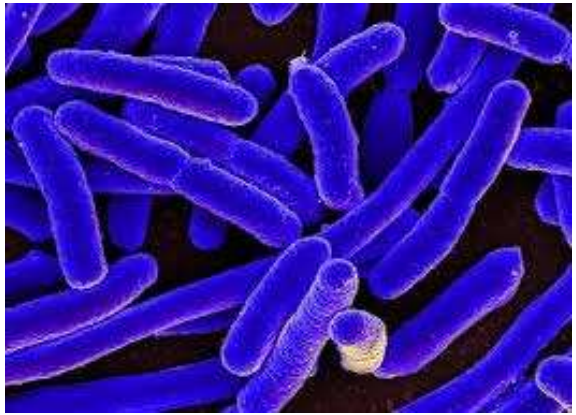
Escherichia coli (E. coli)



ID: 1001

DEGREE OF MANIPULATION: Very easy

SUCCESS RATE : 93%

BASE PRICE : Rs. 5,000

Kluyveromyces marxianus (K. marxianus)

ID: 1007

DEGREE OF MANIPULATION: Cumbersome

SUCCESS RATE : 55%

BASE PRICE : Rs. 2,500

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Phase #2
Biomarker Selection - miRNA

Note: *Pay attention to the comments*

miRNA-21

ID: 2001

Prevalence: Highly Prevalent

Comments: *displayed highest sensitivity and specificity for cervical cancer diagnosis*

Success rate: 94%

Base Price: Rs. 4,500

miRNA-20a

ID: 2002

Prevalence: Prevalent

Comments: *associated with aggressive progression of cervical cancer*

Success rate: 84%

Base Price: Rs. 3,650

miRNA-200a

ID: 2003

Prevalence: Prevalent

Comments: *used for clinical monitoring of cervical cancer*

Success rate: 76%

Base Price: Rs. 3,490

miRNA-29a

ID: 2004

Prevalence: Moderately Prevalent

Comments: *more prevalent in later stages of the disease*

Success rate: 73%

Base Price: Rs. 2,900

miRNA-9

ID: 2005

Prevalence: not very prevalent

Comments: *plays a central role in development of the disease*

Success rate: 69%

Base Price: Rs. 2,300

miRNA-1275

ID: 2006

Prevalence: not very prevalent

Comments: *low specificity biomarker*

Success rate: 46%

Base Price: Rs.1,650

miRNA-203

ID: 2007

Prevalence: not very prevalent

Comments: *low specificity biomarker*

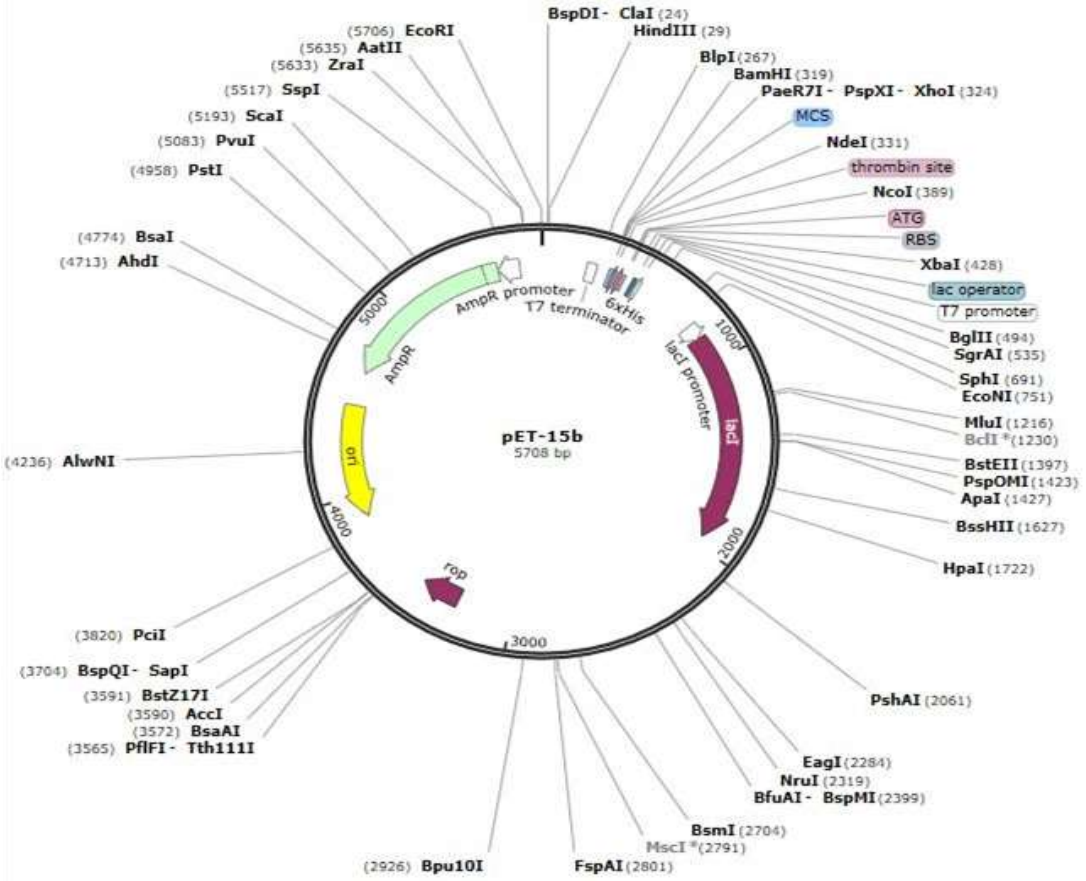
Success rate: 46%

DEFAULT

Phase #3
Plasmid Selection

Note: *Choose plasmids based on their compatibility with Restriction enzymes, copy number(max) and insert size (max)*

pET15b



ID: 3002

COPY NO: Low (~40)

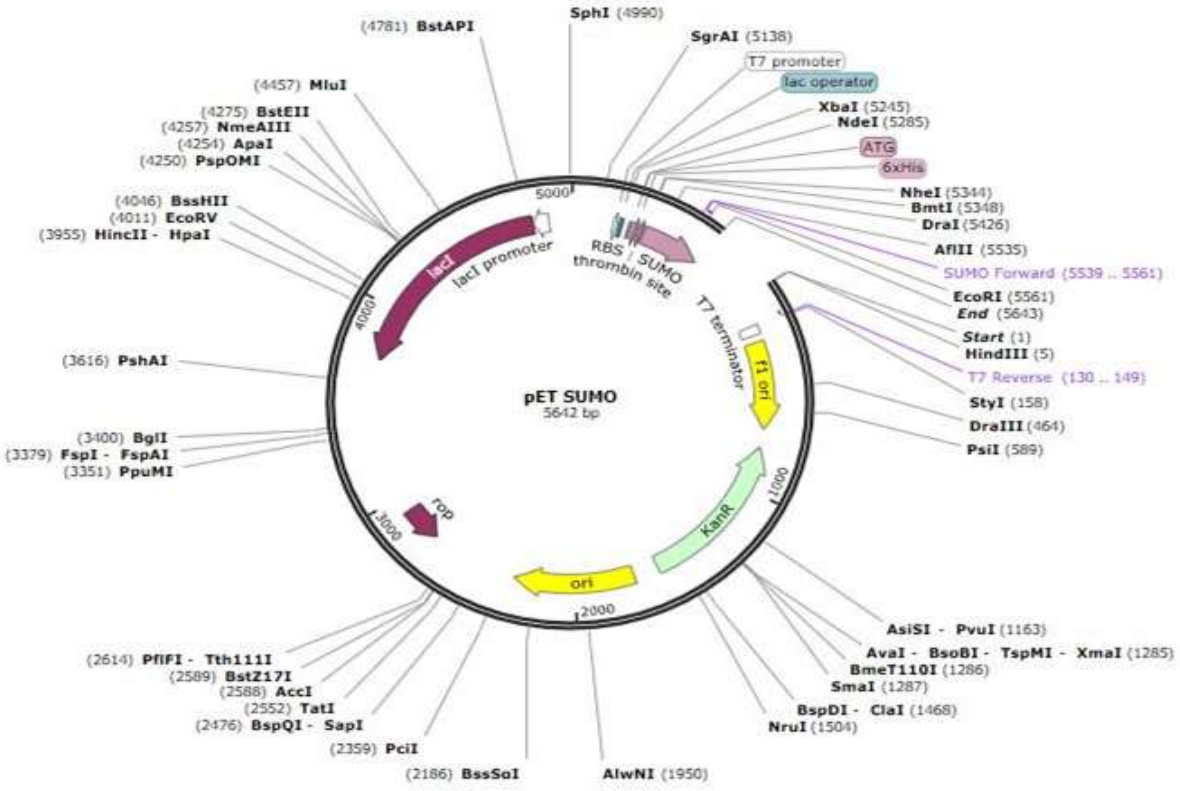
INSERT SIZE: 964 bp

SUCCESS RATE: 57%

DEFAULT

pET-SUMO

ID: 3001



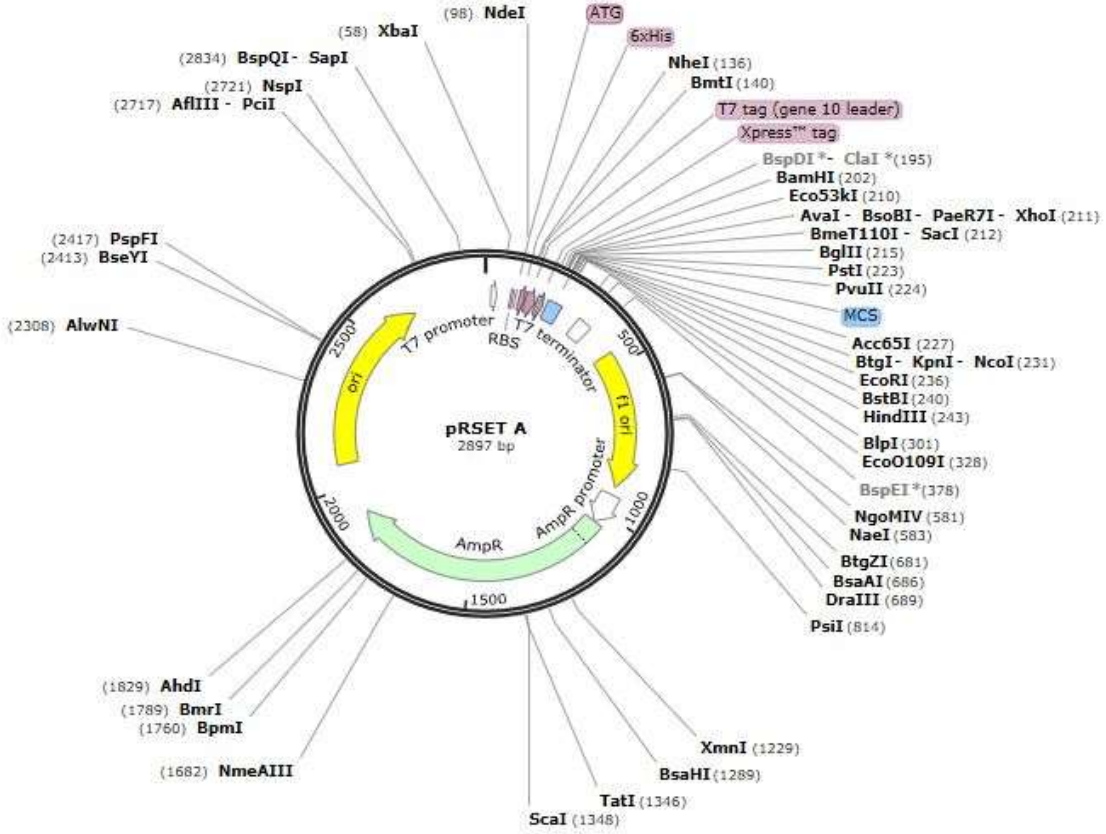
COPY NO: Low

INSERT SIZE: 1455 bp

SUCCESS RATE: 60%

BASE PRICE: Rs. 1,000

pRSET A



ID: 3003

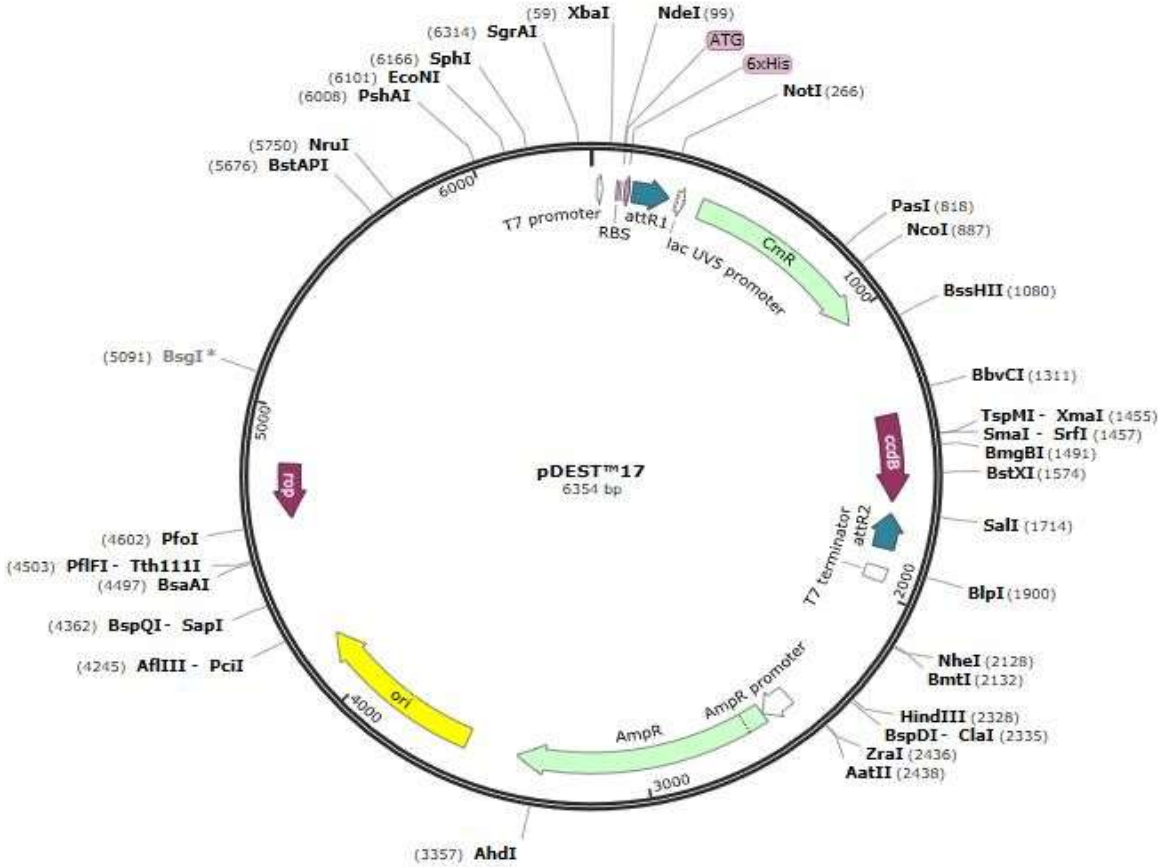
COPY NO: High (~250)

INSERT SIZE: 1953 bp

SUCCESS RATE: 96%

BASE PRICE: Rs. 2,500

pDEST17



ID: 3004

COPY NO: High

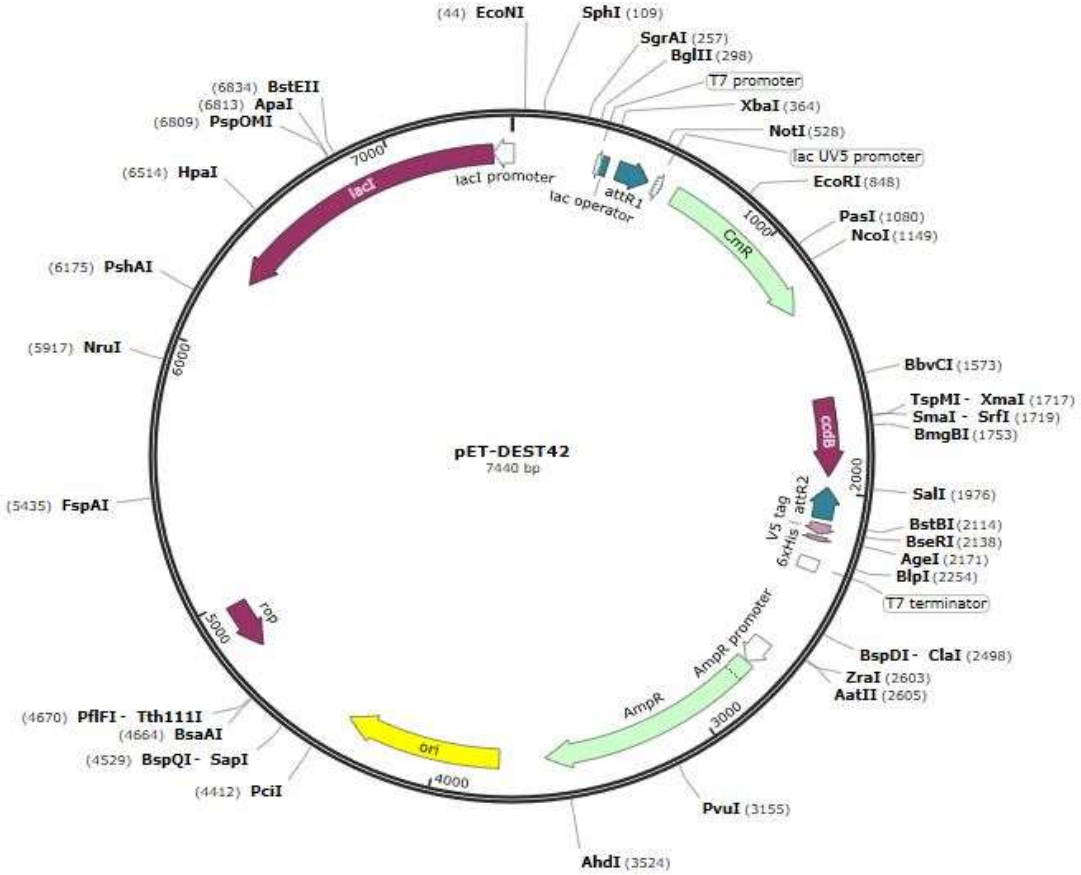
INSERT SIZE: 920 bp

SUCCESS RATE: 72%

BASE PRICE: Rs. 1,275

pET-DEST-42

ID: 3005



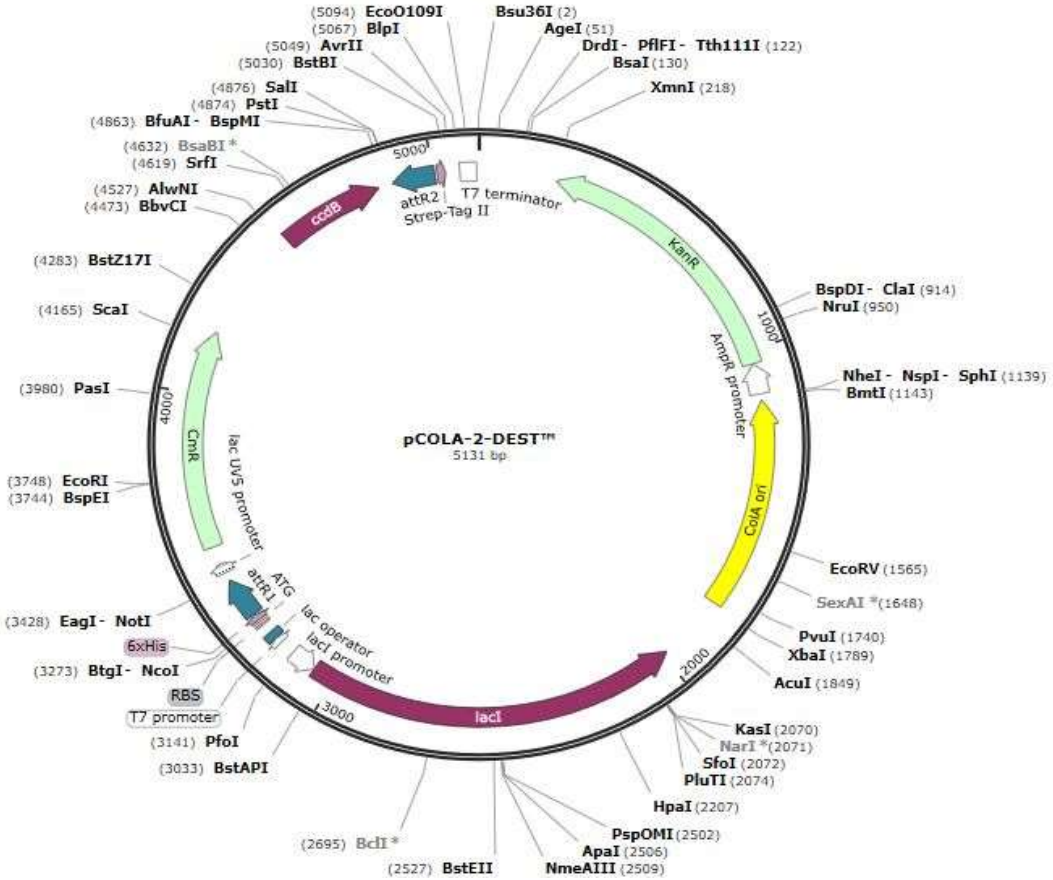
COPY NO: High

INSERT SIZE: 1000 bp

SUCCESS RATE: 89%

BASE PRICE: Rs. 1,999

pCOLA-2-DEST



ID: 3006

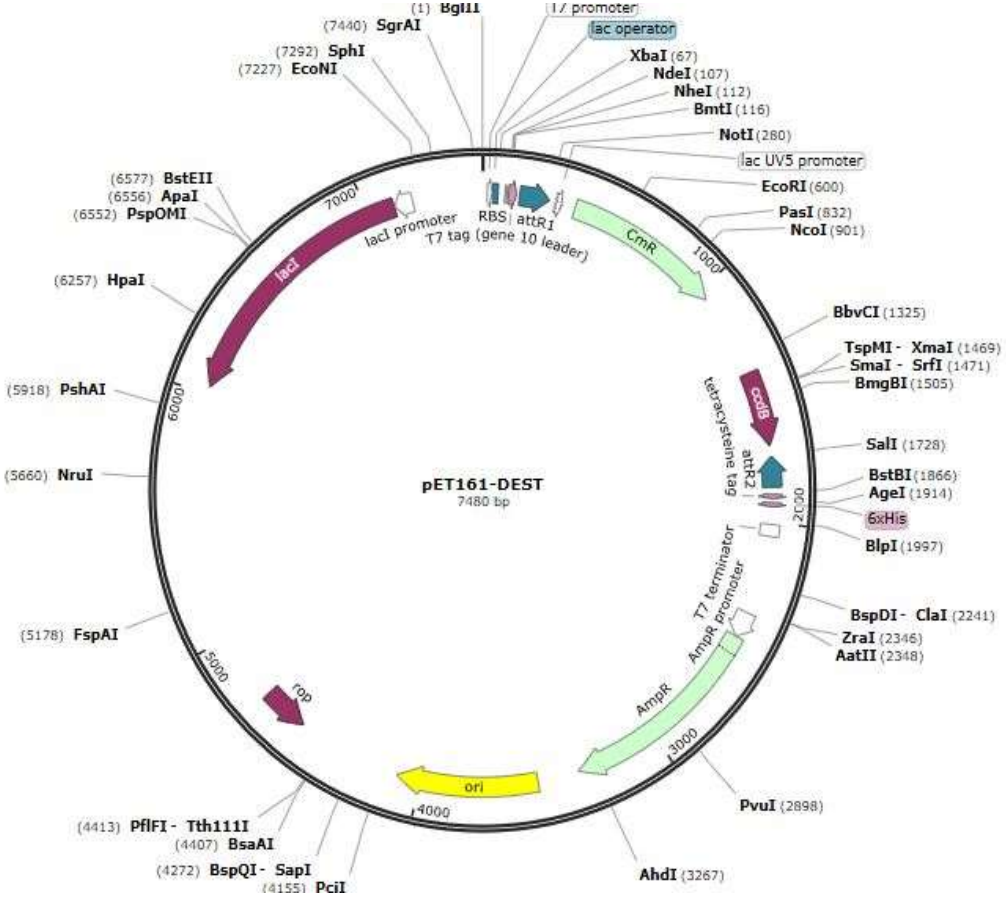
COPY NO: High

INSERT SIZE: 990 bp

SUCCESS RATE: 80%

BASE PRICE: Rs. 1,498

pET161-DEST



ID: 3007

COPY NO: High

INSERT SIZE: 900 bp

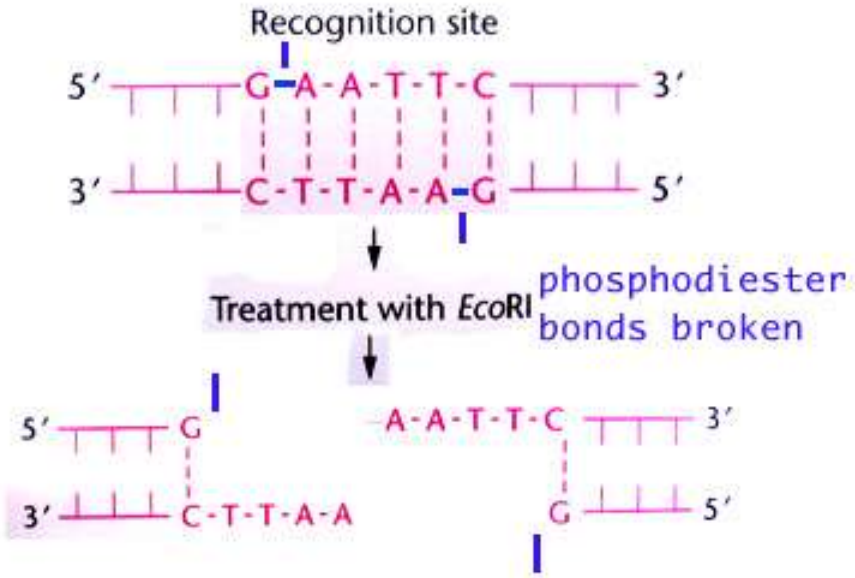
SUCCESS RATE: 70%

BASE PRICE: Rs. 1,156

Phase #4
Restriction Endonuclease Selection

Note: *Choose your enzymes based on the type of ends they produce and don't forget to buy your co-factors!!*

EcoR1



ID No: 4001

1. Produces Sticky ends.
2. SUCCESS RATE: 95%
3. Cofactor- Mg ions.

ENZYME BASE PRICE: Rs. 3,000

Cofactor Base Price: Rs. 1000*

****getting the cofactor is an add-on, only the efficiency of the enzyme will improve***

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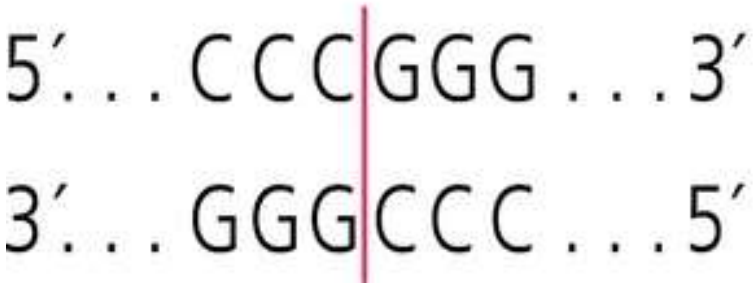
Sma1

Sma I



ID No: 4002

1. Produces Blunt ends.
2. SUCCESS RATE: 80%
3. Cofactor - Potassium ions

ENZYME BASE PRICE: Rs. 2,000

Cofactor Base Price: Rs. 900*

****getting the cofactor is an add-on, only the efficiency of the enzyme will improve***

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Type 1 RE (D)

ID No: 4003

1. Cuts away from the recognition sequence.
2. SUCCESS RATE: 30%

ENZYME BASE PRICE: Rs. 500

Hind III

5’...A↓GATCT...3’
3’...TCTAG↓A...5’

ID No: 4004

1. Produces Sticky ends.
2. SUCCESS RATE: 90%
3. Cofactor - Magnesium ions

ENZYME BASE PRICE: Rs. 2,500

Cofactor Base Price: Rs. 1,000*

****getting the cofactor is an add-on, only the efficiency of the enzyme will improve***

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Bcg1

ID No: 4005

1. Produces Sticky ends.
2. SUCCESS RATE: 75%

ENZYME BASE PRICE: Rs. 1,500

Xma1

ID No: 4006

1. Produces Blunt ends.
2. SUCCESS RATE: 60%

ENZYME BASE PRICE: Rs. 1,200

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Phase #5
Reporter Gene Selection

Note: *Make sure you take into account the detection system while choosing the reporter.*

Green Fluorescent Protein

ID: 5001

Merits: Substrate independent; more stable; brighter

Demerits: Low levels cannot be detected; higher maturation time

Comments: Detected using fluorometer

Success rate: 92%

Base Price: Rs. 15,990

mCherry family

ID: 5002

Merits: Substrate independent; low maturation time

Demerits: Lesser brightness

Comments: Detected using fluorometer

Success rate: 86%

Base Price: Rs. 14,350

Red Fluorescent Protein

ID: 5003

Merits: Substrate independent

Demerits: Lesser stability; higher maturation time

Comments: Detected using fluorometer

Success rate: 78%

Base Price: Rs. 13,550

LacZ

ID: 5004

Merits: Rapid naked eye detection

Demerits: Substrate dependent

Comments: Detected using enzymatic assay

Success rate: 67%

Base Price: Rs. 20,500

Luciferase

ID: 5005

Merits: High sensitivity

Demerits: Substrate dependent; time consuming

Comments: Detected using luminometer or optical microscope

Success rate: 56%

Base Price: Rs. 19,450

Cholarmphenicol acetyl transferase (CAT)

ID: 5006

Merits: Low levels can be detected easily

Demerits: Radioactive labelling needed

Comments: Detected using Thin Layer Chromatography

Success rate: 44%

Base Price: Rs. 17,800

β-Glucuronidase

ID: 5007

Merits: Stable and good sensitivity

Demerits: Substrate dependent; mostly used in plants

Comments: Detected using enzymatic assay

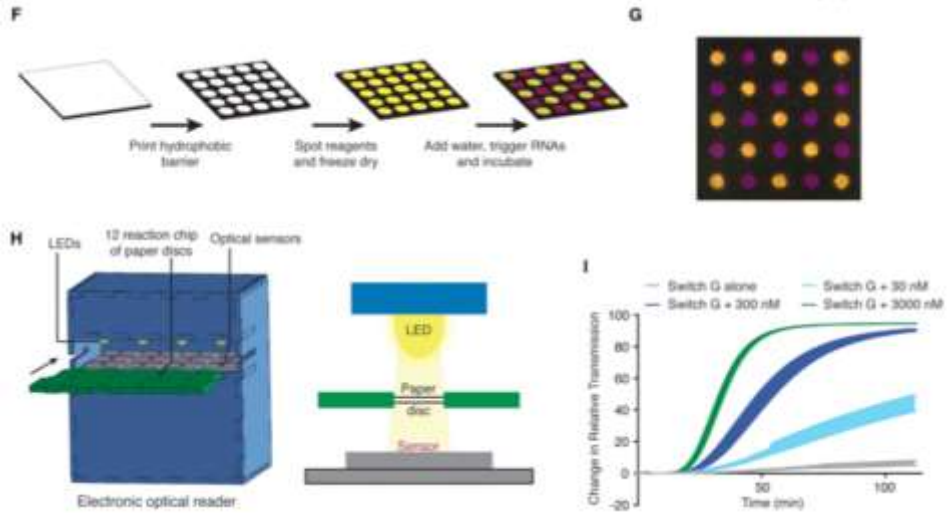
Success rate: 37%

DEFAULT

Phase #6
Detection System Selection

Note: *Make sure you choose the detection system based on the reporter gene you have chosen because "Beauty lies in the eyes of the beholder"*

Optical - Absorption based



ID: 6001.1

Merits: Low cost; moderate selectivity;

Demerits: Low sensitivity; low reliability

Success rate: 84.3%

Base Price: Rs. 3,250

Optical - Fluorescence based

ID: 6001.2

Merits: High selectivity; moderate selectivity

Demerits: Saturation errors

Success rate: 87.9%

Base Price: Rs. 25,110

Conductometric based

ID: 6006

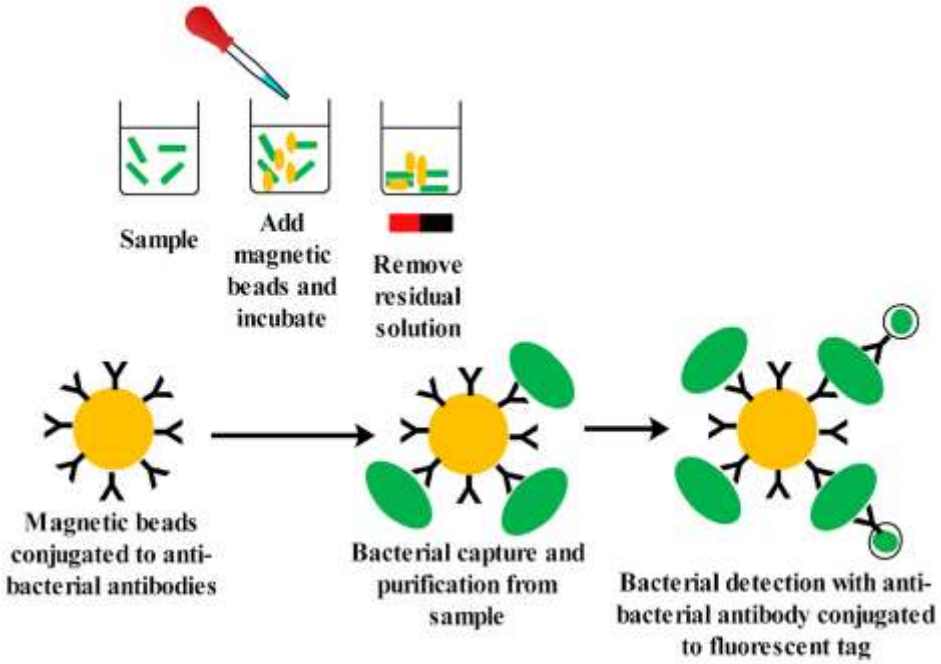
Merits: Quantitative analysis possible; high selectivity; high sensitivity; rapid detection possible

Demerits: -

Success rate: 92.2%

Base Price: Rs. 23,200

Magnetic based



ID: 6004

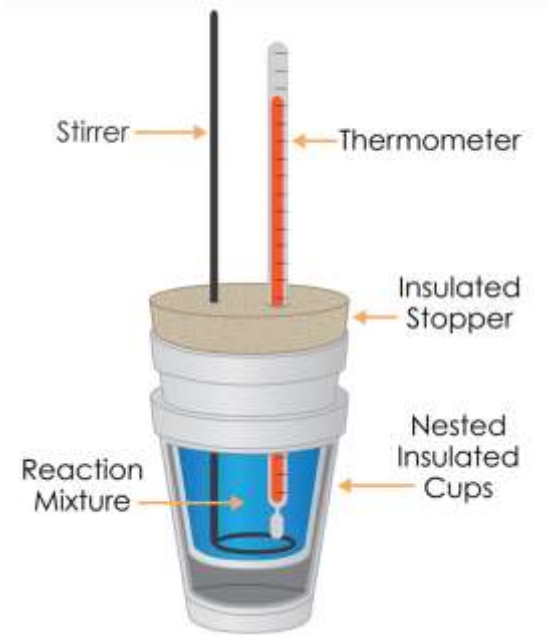
Merits: Allows physical separation of components apart from detection; rapid detection possible

Demerits: Low sensitivity; frequent calibration required

Success rate: 75%

Base Price: Rs. 5,990

Calorimetric (Heat) based



ID: 6005

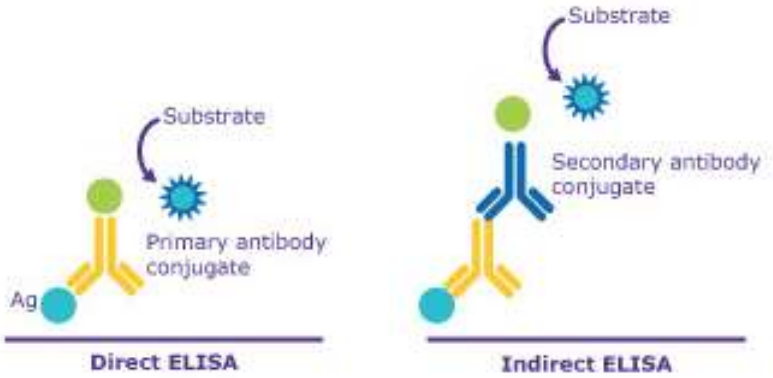
Merits: Low cost; long life; portable

Demerits: Frequent calibration required; susceptible to damage

Success rate: 78%

Base Price: Rs. 7,770

Immunoassays (D)



ID: 6007

Merits: High specificity; both qualitative and quantitative analyses possible

Demerits: Slower technique (need to wait for a day or so); reuse not possible; low sensitivity

Success rate: 62%

Electrochemical based

ID: 6002

Merits: Quantitative analysis; automated method; most utilized method for clinical diagnosis; high selectivity; high sensitivity; rapid detection

Demerits: -

Success rate: 95%

Base Price: Rs. 29,999

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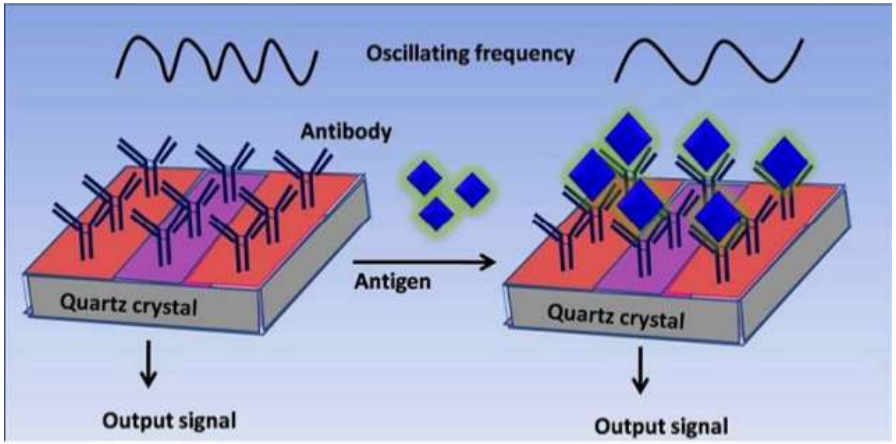
Piezoelectric based



ID: 6003

Merits: Enhanced sensitivity and selectivity than electrochemical method; fastest response time among the methods

Demerits: Temperature based changes in the final output

Success rate: 81.8%

Base Price: Rs. 49,999

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SynBio Auction officially closes....

Time to consolidate, discuss and present your solutions!

Thank you for being a wonderful audience!

All the best for your future endeavours..

With much love and gratitude,

iGEM 2019 SASTRA Team