E. COLIMOUSINE

E. COliMousine
Transportation of Target Signals
Human Practices

Inspiration

Applications

Experiments

Modules

Bio-information Processing

Simple Action

Signal  Promoter  Effector

Intracellular/adjacent cell interaction
Bio-information Processing

Complex Action

Difficulty in avoiding unwanted cross-talk.
Bio-information Processing

Complex Reactions

Generator

Processor

Transporter

Spatial-segregation & Cell population cooperation
How Does It Work?

*E. coli* expressing binding module receives and carries signal molecules.
Signal molecules will be transported to the destination on *E. coli*. 
Waiting at the end, another strain expressing knives will release the signal again.
E. coli can move back and start a new cycle.
Whole Process

Inspiration

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E.C.O.LIMOUSINE

Movement

Receiving

Releaseing
E.COLUMOUSINE

Inspiration

Modules

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Movement

Receiving

Releasing
E. coli LIMOUSINE

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Receiving

SH3

Ligand tag

Receptor

HIV Protease Cleavage Site

Transmembrane Protein
E.C.O | LIMOUSINE

Inspiration

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E. coli LIMOUSINE

HIV protease

Releasing

Ligand tag

Receptor

HIV Protease Cleavage Site

Transmembrane Protein
E. coli Movement

Tumble

Swim
Transition and Working Cycle

Inversion of promoter changes movement direction
Experiment Modules

Inspiration

Modules

Experiment

Applications

Human Practices

Releasing

Movement

Receiving
Receiving Module

OmpA-HIV cleavage site- SH3

OmpA | HIV-site | SH3 domain

pSB1C3
proline-rich – mCherry plasmid

His-tag proline-rich mCherry

pSB1C3

IPTG Induction

Ni Column
Signal Module

Inspiration

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E. coli

Imidazole Elution

20mM 200mM

Anti-His tag blot

mCherry

His tag
Human Practices

Inspiration

Modules

Experiment

Applications

with Receiving Module (200X)

without Receiving Module (200X)
Experiment Modules

Inspiration

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Experiment

Applications

Human Practices

Receiving

Movement

Releasing
Releasing Module

OmpA-HIV protease plasmid

OmpA HIV protease

pSB1C3

OmpA HIV-site SH3
Inspiration

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E. coli

LIMOUSINE

Release

+ E. coli with protease (200X)

+ E. coli without protease (200X)
Experiment Modules

Receiving

Movement

Releasing
Forming a Stable Gradient to Follow
Forming a Stable Gradient to Follow with dialysis membrane and water outside...
Movement

Modeling: Gradient can be Generated Close to the Bar

Away from the bar
Along the gel bar
Movement

Generating the Gradient Using Orange Dye
Aspartate Gradient

Experiment
- OD600
- 1.8
- 1.7
- 1.6
- 1.5
- 1.4
- 1.3

+Aspartate  -Aspartate

- blank end
- AA end
Experiment Modules

- Receiving
- Movement
- Releasing

Inspiration

Modules

Experiment

Applications

Human Practices
Potential Applications

Delivering Information in a Bio-system

Specific and Efficient
Potential Applications

Delivering Information in a Bio-system

Expand the COMPATIBILITY
E.CO LIMOUSINE

Inspiration
Modules
Experiments
Applications
Human Practices

Publicity

iGEM Lecture in Tsinghua
LI Guanqiao, our team member, gave a talk on synthetic biology, the only talk given by an undergraduate.
Xiamen University

Solved their difficulty in building parts. Helped them transform bacteria and mailed them the culture.
Cooperation

Yangming University (NYMU) - Taipei

Helped them characterize growth of AMB-1, magnetic bacteria.

Checked function of part BBa_K624021
Thank Prof. Guoqiang Chen and Prof. Zhirong Sun for kind guidance in the project.

Thank Dr. Mark Goulain from University of Pennsylvania for providing chemotaxis E. coli strain.

Thank iGEM Team Tsinghua-A for helping in visualizing and solving some of our models.

Thank Prof. Yigong Shi and Xiang Gao for providing pET plasmid.
E. CO LiMousine