Electroporation

Electroporation is a [microbiology](https://en.wikipedia.org/wiki/Microbiology) technique in which an [electrical field](https://en.wikipedia.org/wiki/Electrical_field) is applied to cells in order to increase the permeability of the [cell membrane](https://en.wikipedia.org/wiki/Cell_membrane), allowing chemicals, drugs, or [DNA](https://en.wikipedia.org/wiki/DNA) to be introduced into the cell. Competent cells used in transformation are made by ourselves.

First, we cultivate E. coli with 50 ml LB broth one night before transformation, and incubate under 200 rpm shaking overnight. After one night cultivation, we transfer 25 ml overnight culture into 500 ml new LB broth and incubate under 200 rpm shaking. After OD value reach 0.4~0.6 under 600 nm wavelength, we put the bacterium culture on the ice for 15 minutes and centrifuge with 7000 rpm in 4℃ environment for 5 minutes. After finishing centrifuge, we use 10 % glycerol to wash and suspend the pellet, and repeatedly centrifuge with 7000 rpm in 4℃ environment for 5 minutes for three times. Lastly, we use 10% glycerol to suspend competent cell and distribute to different eppendorfs. The competent cells can be used immediately or store in -80℃ refrigerator.

Before starting electroporation, put the 0.1mm cuvette (BTX) on ice for 30 minutes. After 30 minutes, we could put our plasmid or ligation sample into competent cells and mix fully. Lastly, we transfer the competent cells into cuvette carefully to avoid the presence of bubble, and then adjust the electroporation apparatus to 1600 V, 150 ohms, 50 μF to start electric shock. After the electric shock, immediately add 950 μl LB broth into cuvette to wash the competent cell, and transfer the competent cell into eppendorf then incubate under 200 rpm shaking for 1 hr before smearing.