

### Purpose: Transform *Symbiodinium* via Electroporation method

1. Cultivate *Fugacium kawagutii* (formerly *Symbiodinium kawagutii*) cells in L1 medium with an antibiotic cocktail for 3-4 weeks and *Alexandrium catenella* cells in L1 with antibiotics for 1-2 weeks. (Final antibiotic concentration is 0.1 mg/ml for Ampicillin, 0.05 mg/ml for Kanamycin and 0.05 mg/ml for Streptomycin).
2. Harvest cells by centrifugation at 800g for 5 min at 4°C.
3. For *F. kawagutii* cells, use 0.1M EDTA to resuspend the cell pellet, centrifuge at 800 g for 2 min at 4°C.
4. Wash cells with 10% Glycerol 3-4 times, centrifuge at 800 g for 2 min in 4°C.  
We also use 384mM D-sorbitol and it works well too.
5. Resuspend the pellet in 10% Glycerol with final cell concentration at  $10^6$  to  $10^8$ /ml.
6. Incubate ~40µl of cells with 5µl (~1µg) of DNA or with 5µl of 10 mM Tris-HCl (control) on ice for 5 min.
7. Put cells into a 0.2 cm cuvette, mix well with finger, electroporate using SHS (2.0 kV, 1 pulse), SC2 (1.5 kV, 1 pulse), or DIC (1.0 kV, 2 pulses, 1.0 msec) program with Bio-Rad MicroPulser 165-2100.
8. Add 1mL of L1 medium with antibiotics to the 0.2 cm cuvette, mix well, and transfer to a 1.5 mL tube, mix well and separate to different wells of a 12-well plate (with BASTA and without BASTA), add additional L1 medium with antibiotics to a total volume of 2 mL.
9. Incubate the 12 well plate in 25°C for *F. kawagutii* and 15°C for *A. catenella* for 24 hours.
10. Add BASTA to the final concentration of 0.5-0.67 mg/ml for *F. kawagutii* and 0.07-0.1 mg/ml for *A. catenella*.
11. Observe cells under normal and epifluorescent microscope in 1-3 days and continue to monitor for several weeks.
12. Plasmids designed and used for *F. kawagutii* and *A. catenella* were DinIII-*bsr*, DinIII-*pat*, the previously described DinIII-*gfp* (Sprecher et al., 2019), and vectors used in previous studies (Ortiz-Matamoros et al., 2015a; Ortiz-Matamoros et al., 2015b)

<https://www.protocols.io/view/Dinoflagellate-transformation-e6bbhan>