Supporting Information

A Furanosyl-Carbonate Autoinducer in Cell-to-Cell Communication of *V. harveyi*

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General

Boron-free water was prepared by treating distilled water with Amberlite™ 743 resin. Autoinducer bioassay (AB) medium was prepared as previously described (Greenberg *et al.*) using either distilled water or boron-free water. *V. harveyi* strains MM30 ($LuxS^-$) and BB170 ($LuxN^-$) were propagated twice in boron-free AB medium (BFAB) and frozen stocks were prepared in BFAB containing 15% glycerol. The following compounds were obtained from Aldrich unless otherwise noted: $FeCl_3$, $MgCl_2$, Cs_2CO_3, CsCl, $Fe(SO_4)_2 \cdot 7H_2O$ (Sigma), $CaCl_2 \cdot 6H_2O$ (Acros), $MnCl_2 \cdot 4H_2O$ (Acros). 1M Stock solutions were prepared in boron-free water. DPD was prepared as previously described by Meijler *et al.*

V. harveyi Bioluminescence Assay

The assays were performed following the protocol reported by Schauder *et al.* In short, *V. harveyi* strain BB170 or MM30 were grown for 18 h at 30°C in AB or BFAB medium and diluted 1:500 in fresh BFAB medium. A 96-well microtiter plated was prepared with wells containing test compounds (120 μL/well) and 30 μL/well of the diluted cells. The plate was then allowed to incubate at 30°C and luminescence generally started to increase after four hours and was measured every 20 minutes, using a Microplate Luminometer LB96V (EG&G Berthold). Measurements were performed in triplicate.

Initial 1 mM Assay for Light Induction

The metals listed above were diluted to a concentration of 1.25 mM in BFAB medium and 120 μL aliquots were placed in a 96-well microtiter plate. 30 μL of either *V. harveyi* strain BB170 or MM30 cells (diluted 1:500 in BFAB) were added to each well and the plate was incubated at 30°C. Luminescence generally started to increase after 4 hours and was measured every hour. Cells were also monitored for growth at OD_{600} (no effect was observed) and the pH was measured to be neutral.

Counter-ion Exchange Assays

A 1 M stock solution of silver triflate was prepared in boron-free water. A working solution of 100 mM was then prepared by diluting 1:10 in boron-free water. Equimolar amounts of metal chloride and silver triflate were mixed and the insoluble AgCl was filtered off.

Equimolar amounts of cesium carbonate and sodium chloride (in boron-free water) were mixed and diluted to a concentration of 625 μM in boron-free water.

The compounds were then tested for their ability to induce light (as described above) in *V. harveyi* strain BB170 at a starting concentration of 500 μM.

Decreasing [Borate] or [carbonate]

Boric acid, cesium carbonate, potassium carbonate, sodium carbonate and ammonium carbonate were diluted to a concentration of 2.5 mM in BFAB and serially diluted 1:1 in BFAB for a final volume of 120 μL. Subsequently, 30 μL of *V. harveyi* strain BB170 (diluted 1:500 in BFAB) was added to each well and the plate was incubated at 30°C. Luminescence generally started to increase after 4 hours and was measured every 20 minutes.

Decreasing [DPD]

DPD (initial concentration of 10 μM) was serially diluted 1:1 in BFAB for a final volume of 90 μL. 30 μL of 2.5 mM borate or carbonate was then added to each well. Subsequently, 30 μL of *V. harveyi* strain MM30 (diluted 1:500 in

BFAB) was added to each well and the plate was incubated at 30°C. Luminescence generally started to increase after 4 hours and was measured every 20 minutes.