The antimicrobial effects of the alginate oligomer OligoG CF-5/20 are independent of direct bacterial cell membrane disruption

Manon F. Pritchard*1; Lydia C. Powell1; Saira Khan1; Peter C. Griffiths2; Omar T. Mansour2; Ralf Schweins3; Konrad Beck1; Niklaas J. Buurma4; Christopher E. Dempsey5; Chris J. Wright6; Philip D. Rye7; Katja E. Hill1; David W. Thomas11; Elaine L. Ferguson11

1Advanced Therapies Group, Oral and Biomedical Sciences, School of Dentistry, College of Biomedical and Life Sciences, Cardiff University, Heath Park, Cardiff, UK. 2Department of Pharmaceutical, Chemical and Environmental Sciences, Faculty of Engineering and Science, University of Greenwich, Medway Campus, Central Avenue, Chatham Maritime, UK. 3Institut Laue-Langevin, DS/LSS group, 6 rue Jules Horowitz, 38042 Grenoble Cedex 9, France. 4Physical Organic Chemistry Centre, School of Chemistry, Cardiff University, Cardiff, UK. 5School of Biochemistry, Biomedical Sciences Building, University Walk, Clifton, BS8 1TD, UK. 6Centre for NanoHealth, Systems and Process Engineering Centre, College of Engineering, Swansea University, Swansea, UK. 7AlgiPharma AS, Sandvika, Norway.

*Corresponding author (email: PritchardMF@cardiff.ac.uk). †These authors jointly supervised this work.
Supplementary Fig. S1. Structural analysis of LPS. Small-angle neutron scattering from LPS (10 mg/ml) in D₂O containing (a) 0.001 M NaCl, (b) 0.01 M NaCl and (c) 0.1 M NaCl at pH 5-9.
Supplementary Fig. S2. Self-aggregation of OligoG CF-5/20. Enthalpogram for the dilution of 20 mg/ml OligoG CF-5/20 at 37°C in buffer (a) 20 mM phosphate pH 7, 100 mM NaCl, 1 mM EDTA, or (b) in 20 mM phosphate pH 7, 100 mM NaCl, 1 mM CaCl$_2$ (c) or in 20 mM phosphate pH 7, 100 mM NaCl, 1 mM EDTA, 2 mM CaCl$_2$. 
Supplementary Fig. S3. Effect of OligoG CF-5/20 on S. mutans cell surface charge at pH 5 and pH 7 (2.6 mM NaCl ± 60 mg/ml OligoG CF-5/20). Mean zeta potential measurements (mV) of S. mutans, 60 mg/ml OligoG CF-5/20 and both combined following hydrodynamic shear.