Influence of surface topography on *Ulva* settlement

L. Xiao[1, 2]*, *S. E. Thompson*[3], *M. Röhrig*[4], *M. E. Callow*[3], *J. A. Callow*[3], *M. Grunze*[1, 2], *A. Rosenhahn*[1, 2]

[1] *Institute of Functional Interfaces, Karlsruhe Institute of Technology, PO Box 3640, 76021 Karlsruhe, Germany*

[2] *Applied Physical Chemistry, Ruprecht-Karls-University Heidelberg, INF 253, 69120 Heidelberg, Germany*

[3] *School of Biosciences, University of Birmingham, Birmingham B15 2TT, United Kingdom*

[4] *Institute of Microstructure Technology, Karlsruhe Institute of Technology, PO Box 3640, 76021 Karlsruhe, Germany*

* *linlin.xiao@uni-heidelberg.de*

Marine biofouling is the undesired accumulation of microorganisms, plants and animals on artificial surfaces immersed in the sea [1]. The increased hydrodynamic drag caused by fouling leads to higher operating costs of vessels. Studying the interaction between marine organisms and surfaces enhances the development of environmentally compatible approaches to control fouling [2]. Surface microtopography has been found to influence the settlement of cells and larvae [3]. We have studied the influence of surface topographic features on the biofouling process. Honeycomb gradient structures were obtained by a hot embossing process [4], and the effect on the density of spores of the green alga Ulva that attached in laboratory assays was quantified. The highest density of spores was found when the size of the microstructures was similar to or larger than the size of a spore. With decreasing size of the honeycombs, spore settlement decreased. Interestingly, spore settlement closely correlated with the Wenzel roughness of the surfaces. During settlement, “kink positions” on the surface played an important role and resembled preferred attachment positions. The gradients furthermore allowed determining the minimum pit size chosen by the spores to squeeze in and settle.

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