

Abstract Submitted
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Bacterial adhesion and biofilm formation over a substrate with micro printed oily patches MARYAM JALALI, JIAN SHENG, Texas Tech University — Over the past few years, there has been a significant focus on the processes involved in biodegradation of crude oil. In prior studies, using soft lithography and surface functionalization, we have fabricated solid substrates with micro-scale chemical patterns, and applied them to studying the bacteria-surface interactions as well as the formation of biofilm over these micro-patterned surfaces. A strong correlation between biofilm morphology and substrate patterns was found. In our current work we investigate the bacterial adhesion and biofilm formation of hydrocarbon degrading bacteria on micro printed oily surfaces with different micro-scale textures. The oily patterns were formed by contact printing of crude oil on a glass substrate with PDMS stamps. The oil patterned surface is additionally combined with a microfluidics as its bottom substrate. This unique lab-on-a-chip device allows us to investigate the complex interactions microscopically and over a long time. Additionally, it allows us to conduct experiments to elucidate the dynamic interactions such as swimming, dispersion, attachment, detachment, and adsorption between bacteria and micro printed oily surfaces under flow conditions *in-situ*. The growth rates and morphology of bacterial colony and biofilm are also studied and reported.

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