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Biomimetic antibacterial surfaces - fatty acid molecular packing and surface topology on HOPG by grazing incidence diffraction

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The distinctive topology on the wings of some insects may provide a physical anti-bacterial action based on the penetration of the cell wall/membrane and the disruption of the integrity of the intra-cellular solution. Surfaces which mimic the topology of the insect anti-bacterial surface may be produced by the crystallization of fatty acid molecules on a highly ordered pyrolytic graphite (HOPG) substrate. Based on the nature of the chains which pack on the surface, different topologies may be produced. In this study we use synchrotron grazing incidence x-ray diffraction (GID) to understand the packing of molecules on the surface and their preferred orientation. The work indicates the potential of GID investigations to provide an understanding on the relationship between crystal growth on the surface and the topology of the resultant surface.

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