# Hydrophobin bilayers (HFBI) and their water permeability

Friederike Nolle , Hendrik Hähl, Chloé Bucheron, Jean-Baptiste Fleury and Karin Jacobs

*Department of Experimental Physics ,Saarland University, 66041Saarbruecken, Germany*

Hydrophobins are small, compact and amphiphilic and even stable in aqueous surrounding [1]. One class of these proteins is characterized by a very compact conformation allowing for a 2-D crystal-like packing of these proteins in interfacial layers [2]. As a result, the cohesion of these protein layers is extremely large, giving rise to very stable interfacial layers, in which the proteins adopt a defined orientation.
In a recent study, we used the unusual properties of layers from HFBI a hydrophobin produced by the filamentous fungus *Trichoderma reesei*, to create protein double layers by bringing two protein populated interfaces together [3]. Thus, we could create stable, pure protein bilayers between aqueous (or gaseous) and oily compartments. Our current aim is to determine the physical properties of these bilayers in order to evaluate their suitability as replacement of lipid membranes in, e.g., artificial cell-like entities. In a first step, we investigate the water permeability of these bilayers since this is a main feature of biological membranes and for the proper functioning of important biological processes.

[1] Linder et al., *FEMS Microbiol Rev* 29**,** 877–896 (2005).

[2] Linder et al., *Curr Opin Colloid Interface Sci* 14**,** 356–363 (2009).

[3] Hähl et al., Advanced Materials 29 (2017) 1602888