

## Supplementary information

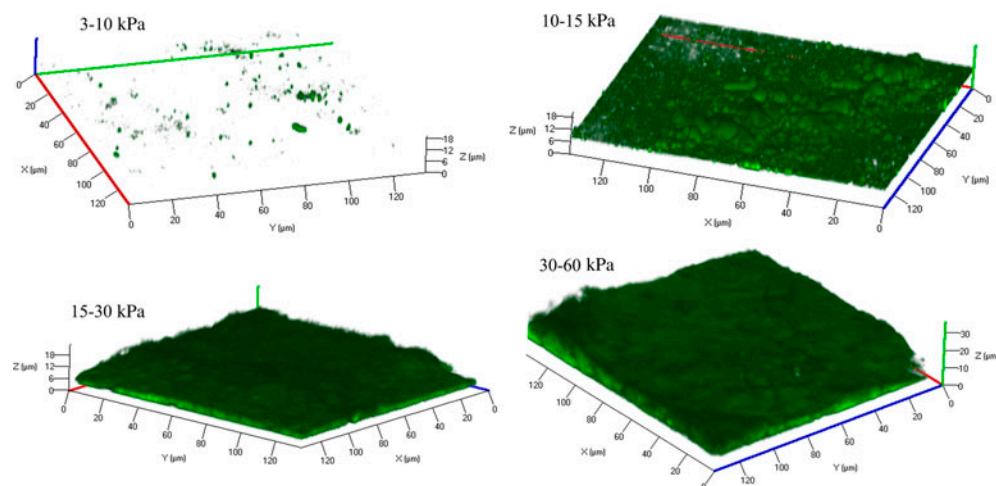


Figure S1. Distribution of proteins on membrane surfaces at different TMP stages. All images are top down projections of 3D reconstructions of the biofouling components. The total magnification for the images was 630 $\times$ .

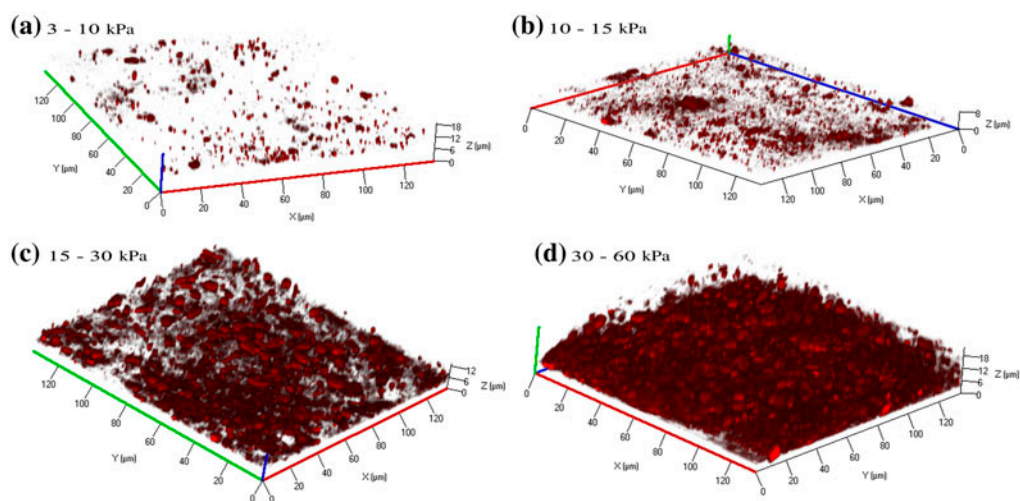


Figure S2. Distribution of (a) alpha-polysaccharides; (b) beta-polysaccharides; (c) proteins; and (d) microorganisms on membrane surfaces at different TMP stages. All images are top down projections of 3D reconstructions of the biofouling components. The total magnification for the images was 630 $\times$ .

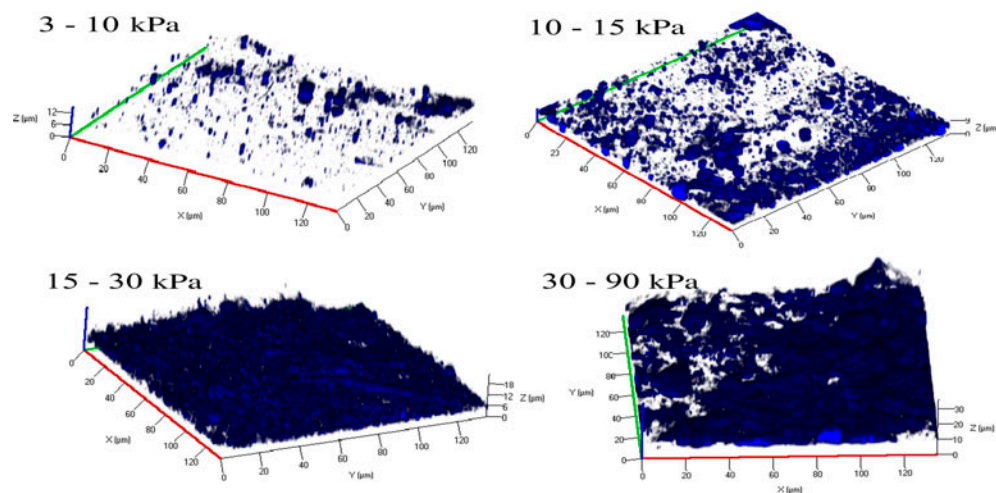


Figure S3. Distribution of beta-polysaccharides on membrane surfaces at different TMP stages. All images are top down projections of 3D reconstructions of the biofouling components. The total magnification for the images was 630 $\times$ .

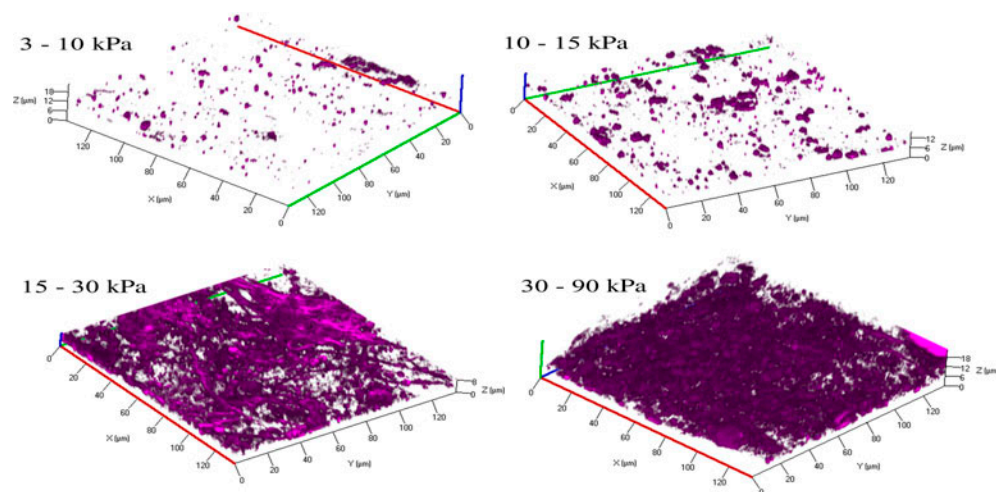


Figure S4. Distribution of microorganisms on membrane surfaces at different TMP stages. All images are top down projections of 3D reconstructions of the biofouling components. The total magnification for the images was 630 $\times$ .

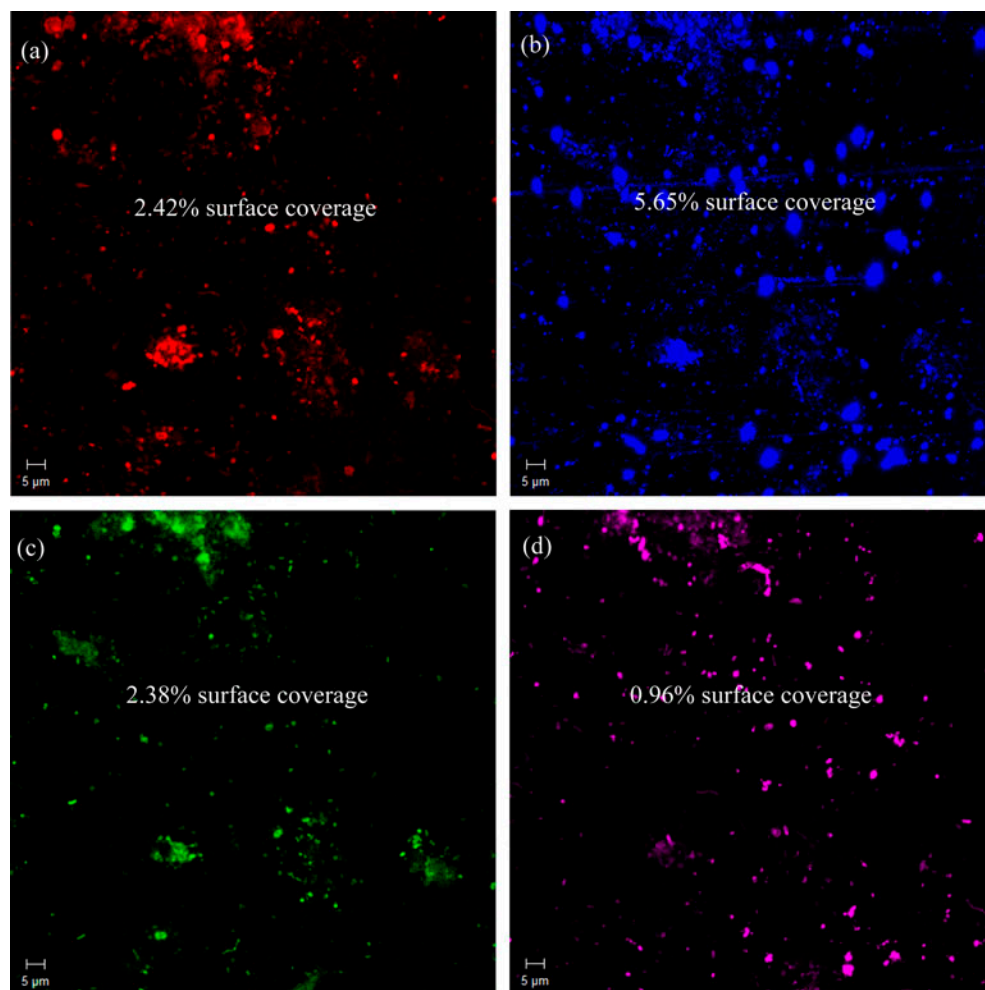


Figure S5. The surface coverage of biofilm components on membranes at 5 kPa. The alpha-polysaccharides (a) are shown in red, the beta-polysaccharides (b) in blue, the proteins (c) in green and the microbial cells (d) in purple. The 2D images were generated using the ‘maximum intensity projection’ process from the 3D images. The total magnification for the images was 630 $\times$ .

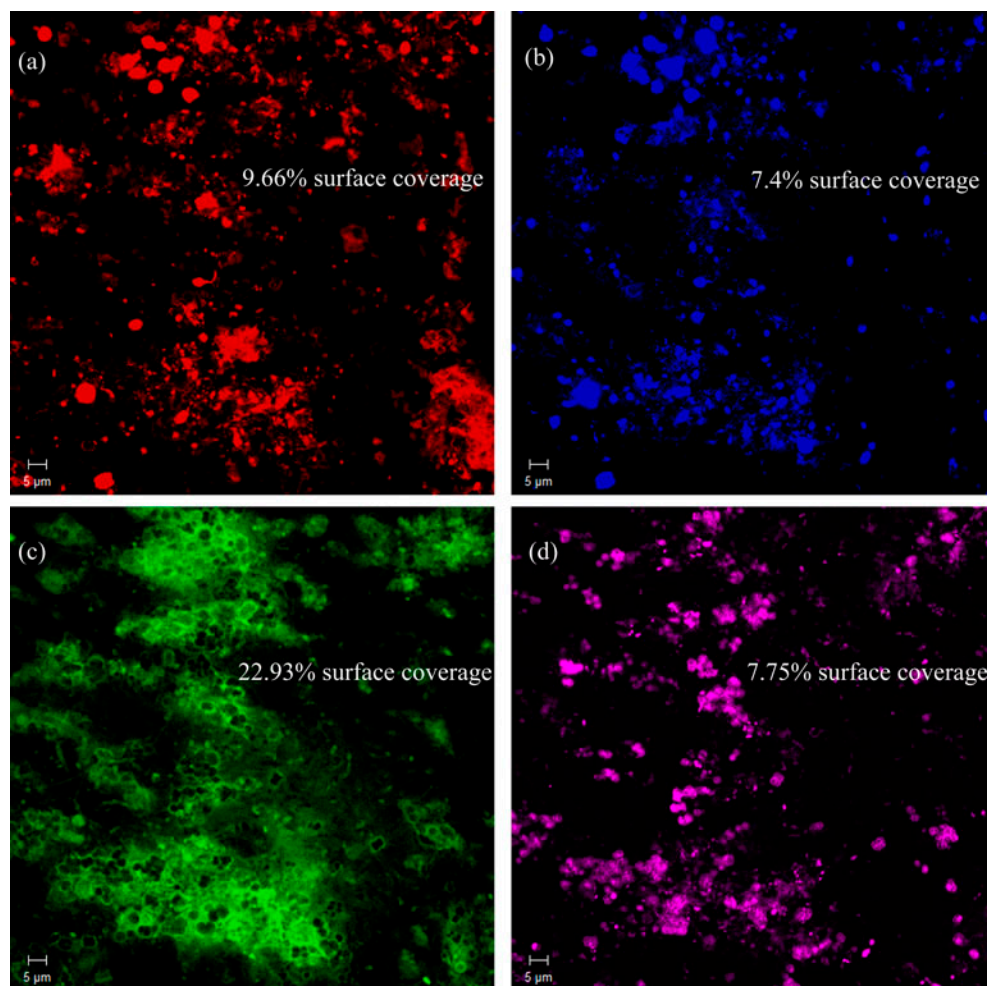


Figure S6. The surface coverage of biofilm components on membranes at 9 kPa. The alpha-polysaccharides (a) are shown in red, the beta-polysaccharides (b) in blue, the proteins (c) in green and the microbial cells (d) in purple. The 2D images were generated using the ‘maximum intensity projection’ process from the 3D images. The total magnification for the images was 630 $\times$ .