Stratification in the physical structure and cohesion of membrane biofilms

—implications for hydraulic resistance

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### 1. Compositional analysis of membrane biofilms

Table 1 Compositional analysis of membrane biofilms grown under nutrient enriched, P limiting and river water conditions after 25 days of growth.

<table>
<thead>
<tr>
<th>Growth condition</th>
<th>Total organic carbon (mg TOC/m²)</th>
<th>Total protein (mg C/m²)</th>
<th>Total polysaccharide (mg C/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrient enriched</td>
<td>1,156 ± 2</td>
<td>239 ± 24</td>
<td>670 ± 171</td>
</tr>
<tr>
<td>P limiting</td>
<td>1,373 ± 72</td>
<td>113 ± 23</td>
<td>1,396 ± 525</td>
</tr>
<tr>
<td>River water</td>
<td>945 ± 262</td>
<td>91 ± 73</td>
<td>1096 ± 136</td>
</tr>
</tbody>
</table>
2. 2D OCT of biofilm structural response to hydraulic shear stress

2.1 Nutrient enriched biofilms

Figure 1 Selection of OCT images showing 2D biofilm physical structure of nutrient enriched biofilms after exposure to a defined hydraulic shear stress (Pa) (Image size 2mm (w) x 1.6 mm (h). Images enhance by contrast for display purposes only. Red line: Membrane/biofilm interface
2.2 P limiting biofilms

Figure 2 Selection of OCT images showing 2D biofilm physical structure of P limiting biofilms after exposure to a defined hydraulic shear stress (Pa) (Image size 2mm (w) x 1.6 mm (h)). Images enhance by contrast for display purposes only. Red line: Membrane/biofilm interface.
2.3 River water biofilms

Figure 3 Selection of OCT images showing 2D physical structure of river water biofilms after exposure to a defined hydraulic shear stress (Pa) (Image size 2mm (w) x 1.6 mm (h). Images enhance by contrast for display purposes only. Red line: Membrane/biofilm interface