<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Gravity-driven membrane filtration as pretreatment for seawater reverse osmosis: linking biofouling layer morphology with flux stabilization (Figures and Tables)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>Akhondi, Ebrahim; Wu, Bing; Sun, Shuyang; Marxer, Brigit; Lim, Weikang; Gu, Jun; Liu, Linbo; Burkhardt, Michael; McDougald, Diane; Pronk, Wouter; Fane, Anthony G.</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>2015</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10220/25204">http://hdl.handle.net/10220/25204</a></td>
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<td>© 2014 Elsevier Ltd. This is the author created version of a work that has been peer reviewed and accepted for publication by Water Research, Elsevier Ltd. It incorporates referee's comments but changes resulting from the publishing process, such as copyediting, structural formatting, may not be reflected in this document. The published version is available at: [<a href="http://dx.doi.org/10.1016/j.watres.2014.12.001">http://dx.doi.org/10.1016/j.watres.2014.12.001</a>].</td>
</tr>
</tbody>
</table>
Supplementary data:

FIGURE S1. A schematic describing the submerged GDM process.
FIGURE S2. OCT images showing the development of biofilm on the membrane with operation time (21±1°C, 100 mbar). The scale bars indicating the horizontal and vertical dimension were presented.
FIGURE S3. OCT images showing the development of biofilm on the membrane with operation time (29±1°C, 40 mbar). The scale bars indicating the horizontal and vertical dimension were presented.
FIGURE S4. OCT images showing the development of biofilm on the membrane with operation time (29±1°C, 100 mbar). The scale bars indicating the horizontal and vertical dimension were presented.
### TABLE S1. Characteristics of seawater in the feed tank

<table>
<thead>
<tr>
<th></th>
<th>Feed seawater @ 21 ± 1°C</th>
<th>Feed seawater @ 29 ± 1°C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH</strong></td>
<td>7.6 (6.8, 8.0)</td>
<td>7.7 (6.2, 8.1)</td>
</tr>
<tr>
<td><strong>Conductivity (mS/cm)</strong></td>
<td>40.8 (35.9, 46.4)</td>
<td>42.2 (35.3, 45.0)</td>
</tr>
<tr>
<td><strong>DO (mg/L)</strong></td>
<td>3.5 (3.3, 3.9)</td>
<td>3.3 (2.8, 3.7)</td>
</tr>
<tr>
<td><strong>Na⁺ (mg/L)</strong></td>
<td>11050 (9700, 12330)</td>
<td>9680 (8800, 10560)</td>
</tr>
<tr>
<td><strong>Mg²⁺ (mg/L)</strong></td>
<td>1230 (1090, 1270)</td>
<td>1080 (1010, 1150)</td>
</tr>
<tr>
<td><strong>Ca²⁺ (mg/L)</strong></td>
<td>400 (350, 450)</td>
<td>350 (330,380)</td>
</tr>
<tr>
<td><strong>K⁺ (mg/L)</strong></td>
<td>355 (300,400)</td>
<td>300 (280, 330)</td>
</tr>
<tr>
<td><strong>TOC (mg/L)</strong></td>
<td>4.1 (2.8, 5.4)</td>
<td>4.2 (3.2, 5.4)</td>
</tr>
<tr>
<td><strong>Polysaccharides (mg/L)</strong></td>
<td>0.44 (0.19, 0.95)</td>
<td>0.51 (0.23, 1.07)</td>
</tr>
<tr>
<td><strong>TEP (mg Gum xanthan/L)</strong></td>
<td>1.41 (0.51, 3.09)</td>
<td>2.15 (0.59, 3.83)</td>
</tr>
<tr>
<td><strong>Biopolymers (µg/L)</strong></td>
<td>167 (2, 282)</td>
<td>339 (114, 563)</td>
</tr>
<tr>
<td><strong>Humics (µg/L)</strong></td>
<td>979 (653, 1283)</td>
<td>908 (780, 1036)</td>
</tr>
<tr>
<td><strong>Building blocks (µg/L)</strong></td>
<td>371 (217, 450)</td>
<td>278 (234, 322)</td>
</tr>
<tr>
<td><strong>Low molecular weight compounds (µg/L)</strong></td>
<td>667 (148, 1085)</td>
<td>1139 (922, 1356)</td>
</tr>
</tbody>
</table>

* The presented result was the averaged value of the multi-measured data at different operation time period. The data in the parentheses presented the minimum and maximum values, respectively. 1, n=6; 2, n=2; 3, n=7; 4, n=4; 5; n=3 (21 ± 1°C) and n=2 (29 ± 1°C).
<table>
<thead>
<tr>
<th></th>
<th>Permeate @ 21 ± 1°C</th>
<th></th>
<th>Permeate @ 29 ± 1°C</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>40 mbar</td>
<td>100 mbar</td>
<td>40 mbar</td>
</tr>
<tr>
<td>**Na⁺ (mg/L)**₁</td>
<td>10430 (9680, 11280)</td>
<td>10240 (9670, 10780)</td>
<td>10540 (8710, 12370)</td>
</tr>
<tr>
<td>**Mg²⁺ (mg/L)**₁</td>
<td>1160 (1130, 1260)</td>
<td>1140 (1100, 1210)</td>
<td>1180 (970, 1370)</td>
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<tr>
<td>**Ca²⁺ (mg/L)**₁</td>
<td>380 (320, 430)</td>
<td>380 (360, 410)</td>
<td>380 (310, 410)</td>
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<tr>
<td>**K⁺ (mg/L)**₁</td>
<td>330 (270, 370)</td>
<td>330 (310, 350)</td>
<td>340 (270, 410)</td>
</tr>
<tr>
<td>**TOC (mg/L)**²</td>
<td>5.2 (4.2, 6.5)</td>
<td>4.5 (3.8, 5.7)</td>
<td>5.4 (3.6, 8.7)</td>
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<tr>
<td>Polysaccharides</td>
<td>0.23 (0.03, 0.49)</td>
<td>0.23 (0.07, 0.65)</td>
<td>0.36 (0.07, 0.95)</td>
</tr>
<tr>
<td>(mg/L)³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEP (mg Gum xanthan/L)³</td>
<td>-</td>
<td>2.29 (1.1, 3.94)</td>
<td>-</td>
</tr>
<tr>
<td>Biopolymers</td>
<td>125 (0, 199)</td>
<td>112 (1, 199)</td>
<td>427 (182, 672)</td>
</tr>
<tr>
<td>(µg/L)⁴</td>
<td></td>
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<tr>
<td>Humics (µg/L)⁴</td>
<td>834 (507, 1090)</td>
<td>879 (554, 1127)</td>
<td>1009 (795, 1222)</td>
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<tr>
<td>Building blocks</td>
<td>237 (146, 348)</td>
<td>199 (174, 249)</td>
<td>368 (188, 547)</td>
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<tr>
<td>(µg/L)⁴</td>
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<tr>
<td>Low molecular</td>
<td>1513 (171, 2961)</td>
<td>1282 (29, 2450)</td>
<td>2677 (1759, 3594)</td>
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<tr>
<td>weight compounds</td>
<td>(µg/L)⁴</td>
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</tbody>
</table>

* The presented result was the averaged value of the multi-measured data at different operation time period. The data in the parentheses presented the minimum and maximum values, respectively. 1, n=2; 2, n=7; 3, n=4; 4, n=3 (21 ± 1°C) and n=2 (29 ± 1°C).
<table>
<thead>
<tr>
<th>Condition</th>
<th>Date (day)</th>
<th>$(1 - \varepsilon)^2 H (10^{-6} \text{m}) / \varepsilon^3$</th>
<th>$R (\times 10^{12} \text{m}^{-1})$</th>
<th>$a (\times 10^{-9} \text{m})$</th>
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<tr>
<td>40 mbar</td>
<td>21</td>
<td>1.12</td>
<td>5.65</td>
<td>2.73</td>
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<td></td>
<td>42</td>
<td>1.44</td>
<td>6.63</td>
<td>2.85</td>
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<tr>
<td>100 mbar</td>
<td>21</td>
<td>0.96</td>
<td>5.98</td>
<td>2.45</td>
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<tr>
<td></td>
<td>42</td>
<td>5.89</td>
<td>8.00</td>
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<tr>
<td>40 mbar</td>
<td>21</td>
<td>22.48</td>
<td>2.62</td>
<td>17.94</td>
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<td></td>
<td>42</td>
<td>0.29</td>
<td>3.00</td>
<td>1.90</td>
</tr>
<tr>
<td>100 mbar</td>
<td>21</td>
<td>4.10</td>
<td>5.67</td>
<td>5.21</td>
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<tr>
<td></td>
<td>42</td>
<td>0.32</td>
<td>6.16</td>
<td>1.40</td>
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