Biofilm forming methicillin-resistant *Staphylococcus aureus* induces renal deterioration and severe virulence in a bacteraemic mouse model

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**Background and Aims**

Methicillin-resistant *S. aureus* (MRSA) possess a wide range of biofilm (BF) forming ability, and high BF formers in the blood may induce serious pathologiical virulence. In the present study using highest BF former (H-BF) and lowest BF former (L-BF), we examined general status and tissue BF formation after intravenous bacterial infection in mice.

**Methods**

**MRSA selection**

Bacteria from one colony in TSB were grown until OD=1.0, 200µL of bacteria solution were infused via tail vein.

**Bacteria appearance in the blood after intravenous infection**

**Results**

1) **Loss of body-weight**

2) **Alteration of body conditions**

   ![Graph](image)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Body weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>15 ± 2</td>
</tr>
<tr>
<td>L-BF</td>
<td>13 ± 2</td>
</tr>
<tr>
<td>H-BF</td>
<td>12 ± 2</td>
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</table>

   *p* = 0.0015

3) **MRSA accumulation in different organs**

4) **Kidney change after MRSA infusion**

5) **MRSA accumulation in the kidney and blood**

   ![Graph](image)

6) **CFU analysis - kidney**

   ![Graph](image)

7) **Biofilm formation in the kidney**

   ![Graph](image)

8) **Initial biofilm formation in capillary**

   ![Graph](image)

**Conclusion**

Biofilm forming MRSA in the blood initially settle and form biofilm in renal capillaries of mice, which leads to a biofilm expansion with severe tissue deterioration.