Abstract

Objectives: The multidrug resistance in Pseudomonas aeruginosa is primarily a nosocomial pathogen, responsible for opportunistic infections. These are of great concern, because P. aeruginosa presents intrinsic as well as acquired resistance to a wide variety of antimicrobial agents. In this context, polyspecific efflux pumps play a central role in the multiresistance of P. aeruginosa towards both antibiotics and antimicrobials.

Seven "Mex-type" efflux pumps capable to transport various antimicrobial agents have been characterized in P. aeruginosa, but four of them have been shown to contribute to clinically significant resistance levels (Llanes et al., 2004). In this context, the development of rapid and reliable methods for the early detection of this efflux pumps in clinical isolates may positively assist for the selection of appropriate therapeutic agents in a given patient and also for the screening of resistance mechanisms in epidemiological surveys. We have previously developed and validated a Quantitative-Competitive RT-PCR method to quantify mexA and mexX genes expression levels in references strains and in clinical isolates (ICAAAC 2005; P 192).

Background

Quantification of mexA and mexX: a correlation between QC-RT-PCR and Real-Time PCR.

Results

Materials & Methods

Table 1

<table>
<thead>
<tr>
<th>Strain</th>
<th>mexA QC-RT-PCR</th>
<th>mexX QC-RT-PCR</th>
<th>mexA Real-Time-PCR</th>
<th>mexX Real-Time-PCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAO1</td>
<td>1.00 ± 0.00</td>
<td>1.00 ± 0.00</td>
<td>1.00 ± 0.00</td>
<td>1.00 ± 0.00</td>
</tr>
<tr>
<td>PT629</td>
<td>4.57 ± 0.11</td>
<td>4.18 ± 0.14</td>
<td>1.09 ± 0.20</td>
<td>ND</td>
</tr>
<tr>
<td>SLF05</td>
<td>ND</td>
<td>1.27 ± 0.09</td>
<td>7.09 ± 0.17</td>
<td>6.61 ± 0.07</td>
</tr>
<tr>
<td>SLF30</td>
<td>6.45 ± 0.20</td>
<td>6.04 ± 0.07</td>
<td>1.07 ± 0.20</td>
<td>1.18 ± 0.02</td>
</tr>
</tbody>
</table>

Conclusions

- we developed two techniques for the quantification of mexA and mexX genes in Pseudomonas aeruginosa clinical isolates.
- we observed a satisfactory correlation (> 88%) between the genes expression levels determined by these 2 techniques.
- each of these techniques can therefore be used for the analysis of efflux pumps expression in clinical isolates.

References

- Mesaros et al., Genotypic Method is More Reliable than Phenotypic Characterization to Detect Mex Eﬄux Pumps in Clinical Isolates of Pseudomonas aeruginosa. ICACC 2005, 216.