Antimicrobial properties of Pseudomonas strains producing the antibiotic mupirocin

Mupirocin is a polyketide antibiotic with broad antibacterial activity. It was isolated and characterized about 40 years ago from Pseudomonas fluorescens NCIMB 10586. To study the phylogenetic distribution of mupirocin producing strains in the genus Pseudomonas a large collection of Pseudomonas strains of worldwide origin, consisting of 117 Pseudomonas type strains and 461 strains isolated from different biological origins, was screened by PCR for the mmpD gene of the mupirocin gene cluster. Five mmpD(+) strains from different geographic and biological origin were identified. They all produced mupirocin and were strongly antagonistic against Staphylococcus aureus. Phylogenetic analysis showed that mupirocin production is limited to a single species. Inactivation of mupirocin production leads to complete loss of in vitro antagonism against S. aureus, except on certain iron-reduced media where the siderophore pyoverdine is responsible for the in vitro antagonism of a mupirocin-negative mutant. In addition to mupirocin some of the strains produced lipopeptides of the massetolide group. These lipopeptides do not play a role in the observed in vitro antagonism of the mupirocin producing strains against S. aureus. (C) 2014 Institut Pasteur. Published by Elsevier Masson SAS. All rights reserved.