PBP2a Mutations Causing High-Level Ceftaroline Resistance in Clinical Methicillin-Resistant *Staphylococcus aureus* Isolates.

Bacteria

CASE STUDY

Long S.W. ; Olsen R.J. ; Mehta S.C. ; Palzkill T. ; Cernoch P.L. ; Perez K.K. ; Musick W.L. ; Rosato A.E. ; Musser J.M.

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Introduction

Identifying and understanding antibiotic resistance mechanism in clinical isolates of *Staphylococcus aureus* in human specimens.

Overview

- **Keywords:** Genome sequencing, antibiotic resistance, clinical isolates, ceftaroline
- **Aim of the study:** Understanding antibiotic resistance mechanism in clinical isolates of *Staphylococcus aureus*.
- **Application:** Genome sequencing
- **Sample name:** Patient expectorated sputum & blood
- **Sample type:** Fluid
- **Material:** FastPrep-96™ instrument, Lysing Matrix B tubes
- **Buffer:** Tryptic soy broth

Protocol and Parameters

1. Patient isolates were grown on tryptic soy agar supplemented with 5% sheep blood.
2. Five of the isolates grew from expectorated sputum. The sixth isolate was obtained from an aerobic blood culture bottle.
3. Genomic DNA was isolated from multiple colonies grown overnight in tryptic soy broth.
4. The cells were lysed using Lysing Matrix B in a FastPrep-96 instrument.

Conclusion

The use of the high-throughput FastPrep-96 homogenizer in combination with Lysing Matrix B tubes allows high quality DNA extraction for genome sequencing analysis of ceftaroline-resistant methicillin-resistant *Staphylococcus aureus* (MRSA). Genome sequencing results confirm a previously undescribed high-level antibiotic resistance mechanism in clinical isolates of MRSA.

MP Biomedicals

Americas: 800.854.0530 | custserv@mpbio.com

Europe: 00800.7777.9999 | custserv.eur@mpbio.com

APAC: 65.6775.0008 | enquiry_ap@mpbio.com