Technical Bulletin

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Labinic: Antibiotic Resistance

Antibiotic resistance may be defined as intrinsic, which is not horizontally transferable, and is consistent between the strains of a species; or acquired, where a strain is resistant to an antibiotic to which the species would normally be sensitive, mediated either by gene mutation or by the addition of Antibiotic Resistance Genes (ARGs). The key concern therefore is whether such resistance can be horizontally transferred via the various mechanisms that are described (transformation, conjugation and transduction). The Comprehensive Antibiotic Resistance Database (CARD) is a freely accessible reference source for sequences and mutation data (https://card.mcmaster.ca/).

The Bi-26 infantis and Bb-06 strains show consistent susceptibility to anti Gram-positive antibiotics commonly used in neonatal medicine such as Penicillins, Piperacillin, Macrolides and Vancomycin. Bifidobacteria generally have intrinsic resistance to gentamicin due to the lack of cytochrome-mediated drug transport, but as it is intrinsic it is not considered transferable. There are no reports of ARGs in these Bifidobacterium strains.[1,2]

The case report from the Norwich group indicated that the findings for ARGs in the Bifidobacterium infantis (Bi-26) in Labinic "were in line with previous reports for bifidobacteria showing very limited antibiotic resistance profiles, including for those strains used in probiotics". [3]

Genome sequencing of L. acidophilus NCFM detected no ARGs.[4] The GRAS (Generally Recognised As Safe) FDA submission for L. acidophilus NCFM shows a very low MIC for common neonatal antibiotics (Gentamicin, Penicillin, Vancomycin, Ampicillin).[5]

The use of Labinic in preterm babies has been shown to significantly reduce carriage of antibiotic-resistant Gram-negative bacteria in the neonatal gut for both early and late colonisation (the latter by 93%). This further reduces the risk of the spread of ARGs. [6]

References

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