

IN SILICO SAFETY ASSESSMENT OF PROBIOTICS FOR HUMAN USE USING GENOMICS AND BIOINFORMATICS ANALYSIS APPROACH

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INTRODUCTION: Probiotics are live microorganisms that provide health benefits when consumed by the body. They are used widely in commercial products including fermented foods, yogurts, and dietary supplements. The safety assessment of probiotics for use in commercial products is very important for food industries and public health issues since they can pass transferable antibiotic resistance genes and other mobile genetic elements directly to humans.

OBJECTIVES: Therefore, *in silico* safety assessment of probiotics for human use should be performed to identify related genetic traits that might affect host health. Also, it can provide deep genetic information insight into a bacterial strain to increase the value of the product.

METHOD / DESIGN: Whole-genome sequencing and *in silico* analysis of genomic data using next-generation sequencing technology and comprehensive bioinformatics tools are popular approaches nowadays. They can be performed with many bacterial strains simultaneously and identified species, virulence factors, transferable antibiotic resistance elements, and antimicrobial encoding genes information with online tools and databases.

RESULTS: All related genomic information can be extracted from the analysis including general genome characteristics, all encoding genes, and functional annotation, pathogenic information.

CONCLUSIONS: The obtained information from *in silico* analysis can be used as a preliminary screening and guideline for the safety assessment of probiotics using the genomics and bioinformatics analysis approach.