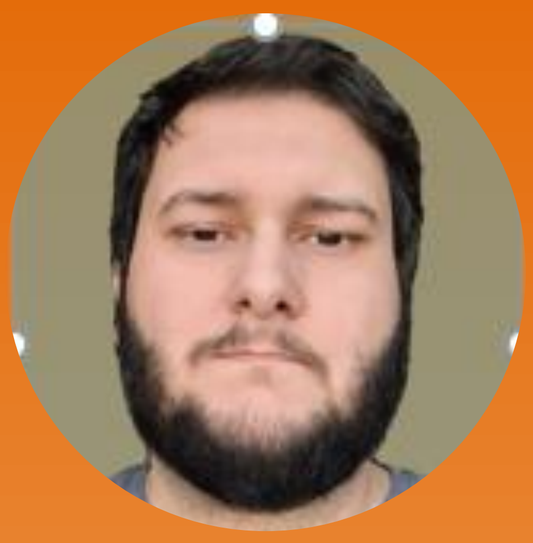
Escherichia coli CEC15: The probiogenomics investigation of a new probiotic strain



Tales DA SILVA

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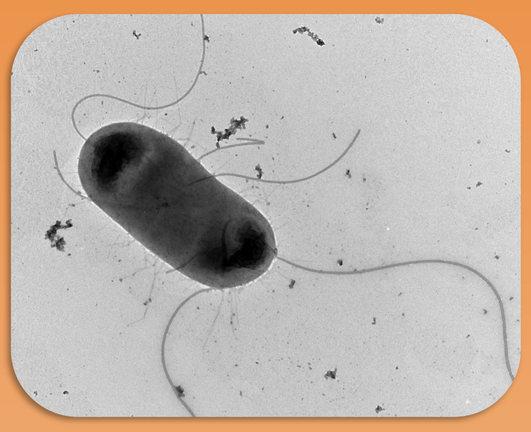


UMR INRAE – L'Institut Agro Rennes-Angers

Science et technologie du lait et de l'œuf

MicroBio team

Microbiology of milk and egg sectors

Federal University of Minas Gerais

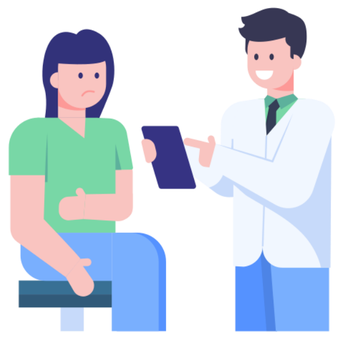
Laboratory of Cellular and Molecular Genetics

Keywords

Escherichia coli
Probiotics
Probiogenomics

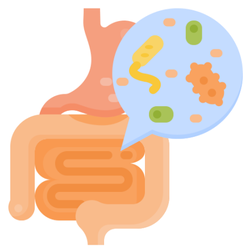
Socio-economic context

- Among adults, probiotics are the third most used dietary supplement other than vitamins and minerals
- A 2021 report noted that the total probiotics market was worth more than 48 billion USD. The market grew 8% globally from 2020 to 2021
- Probiotics offer many opportunities both in food, beverage, and dietary supplement applications



Scientific context

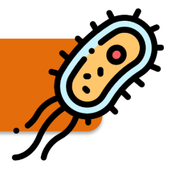
- *Escherichia coli* strains present probiotic properties
- The reference strain *E. coli* Nissle 1917 is already on the market with demonstrated effect against intestinal infections
- *In silico*, *in vitro*, and *in vivo* studies have uncovered potential beneficial activity of bacterial strains



Research question

Does the newly discovered strain *E. coli* CEC15 have *in silico*, *in vitro,* and *in vivo* potential probiotic activity which can be compared to the reference strain *E. coli* Nissle 1917?

Expected results



- Identification of genetic features which would be related to the beneficial effect of the potential probiotic

- Demonstration of:
  - Good ability of *E. coli* CEC15 to survive the intestinal tract passage and to adhere to the gut
  - Safety to the host under high dosage and daily administration *in vivo*
  - Good immunomodulation and intestinal barrier reinforcement
  - Protection against inflammatory process led by 5-FU administration *in vivo*
  - Positive modulation of intestinal microbiota

Perspectives

- New strain to be effectively used as treatment for intestinal inflammatory diseases
- Demonstrate that *E. coli* CEC15 can be used as a beneficial microorganism on the treatment of diseases
- Evaluate the strain effect in clinical studies on humans
- Develop a commercial product with the *E. coli* CEC15 strain
- Do the non-viable bacteria perform the same way?

Funding

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CAPES

Collaborators

UFMG

LGCM Laboratório de Genética Celular e Molecular

Micalis Microbiologie de l'Alimentation au service de la Santé

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