



**HAL**  
open science

## The low-grade intestinal inflammation potentiates sarcopenia in Old Adults that can be restrained by a probiotic: *Streptococcus Thermophilus* CNRZ160

Isabelle Savary-Auzeloux, Marianne Jarzaguet, Jérémie David, Carole Migné, Marcela de Azevedo, Jean-Marc Chatel, Dominique Dardevet

### ► To cite this version:

Isabelle Savary-Auzeloux, Marianne Jarzaguet, Jérémie David, Carole Migné, Marcela de Azevedo, et al.. The low-grade intestinal inflammation potentiates sarcopenia in Old Adults that can be restrained by a probiotic: *Streptococcus Thermophilus* CNRZ160. International Conference on Frailty and Sarcopenia Research, Mar 2020, Toulouse, France. hal-03048771

**HAL Id: hal-03048771**

**<https://hal.inrae.fr/hal-03048771>**

Submitted on 29 Nov 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# The low-grade intestinal inflammation potentiates sarcopenia in Old Adults that can be restrained by a probiotic: *Streptococcus Thermophilus* CNRZ160.

*Savary-Auzeloux I, Jarzaguet M, David J, Migné C, De Azevedo M, Chatel JM, Dardevet D.*

1-Université Clermont Auvergne, INRA, UNH, Unité de Nutrition Humaine, CRNH Auvergne, F-63000

2- Micalis, INRA, AgroParisTech, Université Paris Saclay, Jouy en Josas, 78350

## **Background-Objectives**

Aging is characterized, at the systemic level, by the development of low-grade inflammation, which has been identified as determinant sarcopenia by preventing post prandial muscle anabolism. The origin of this “inflammaging” is still not clearly defined. An increase in intestinal permeability, a microbiota dysbiosis and subsequent generation of a micro- and then generalized inflammation has been hypothesized. The objective of our study is to test in vivo during aging, if 1) a chronic low grade intestinal inflammation can lead to anabolic resistance and muscle loss and 2) if a bacterial strain presenting anti-inflammatory properties could prevent these adverse effects.

## **Methods**

To generate low grade intestinal inflammation, elderly rats (18m) were treated with chronic adapted Dextran Sodium Sulfate (DSS) ingestion for 28 days with (CNRZ group) or without (DSS group) *S. Thermophilus* CNRZ160 ( $10^9$  CFU / day) previously shown to present an anti-inflammatory potential in vitro. They were compared to pair fed control (PF). Body composition was measured in vivo by EchoMRI whereas muscle and colon weights and protein synthesis (using  $^{13}\text{C}$  Valine) were at slaughter. Groups were compared using ANOVA and Fisher posthoc test ( $p < 0.05$ ).

## **Results**

Body weight, lean mass and to a lesser extend fat losses were significantly greater in DSS compared to PF controls (-110 vs -86g, -51 vs -36g and -65 vs -47g, respectively). Similarly, gastrocnemius and tibialis muscles were smaller by 12% and 10% vs PF respectively. In contrast, colon was increased by 13% with DSS. Our probiotic allowed: 1) to maintain normal colon weight (2.09 for CNRZ vs 2.14g for PF) by preventing increase in protein synthesis 2) to limit the loss of lean body mass (-36g for CNRZ vs -38g for PF), 3) to limit muscle loss via a maintenance of post prandial muscle protein synthesis.

## **Conclusion**

In the elderly, the loss of lean and muscle mass associated with low-grade intestinal inflammation can be reduced by the ingestion of *S. Thermophilus*. Preliminary data in adult rats showed that CNRZ160 prevented TNF $\alpha$  and IL1 $\beta$  up-expression in DSS-treated adult colon by 78 and 92%. CNRZ160 could therefore be considered as an efficient probiotic to modulate muscle mass loss and limit sarcopenia during aging.