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# A Promising Probiotic Capable to Reduce the Impact of Undernutrition on the Development of Sarcopenia

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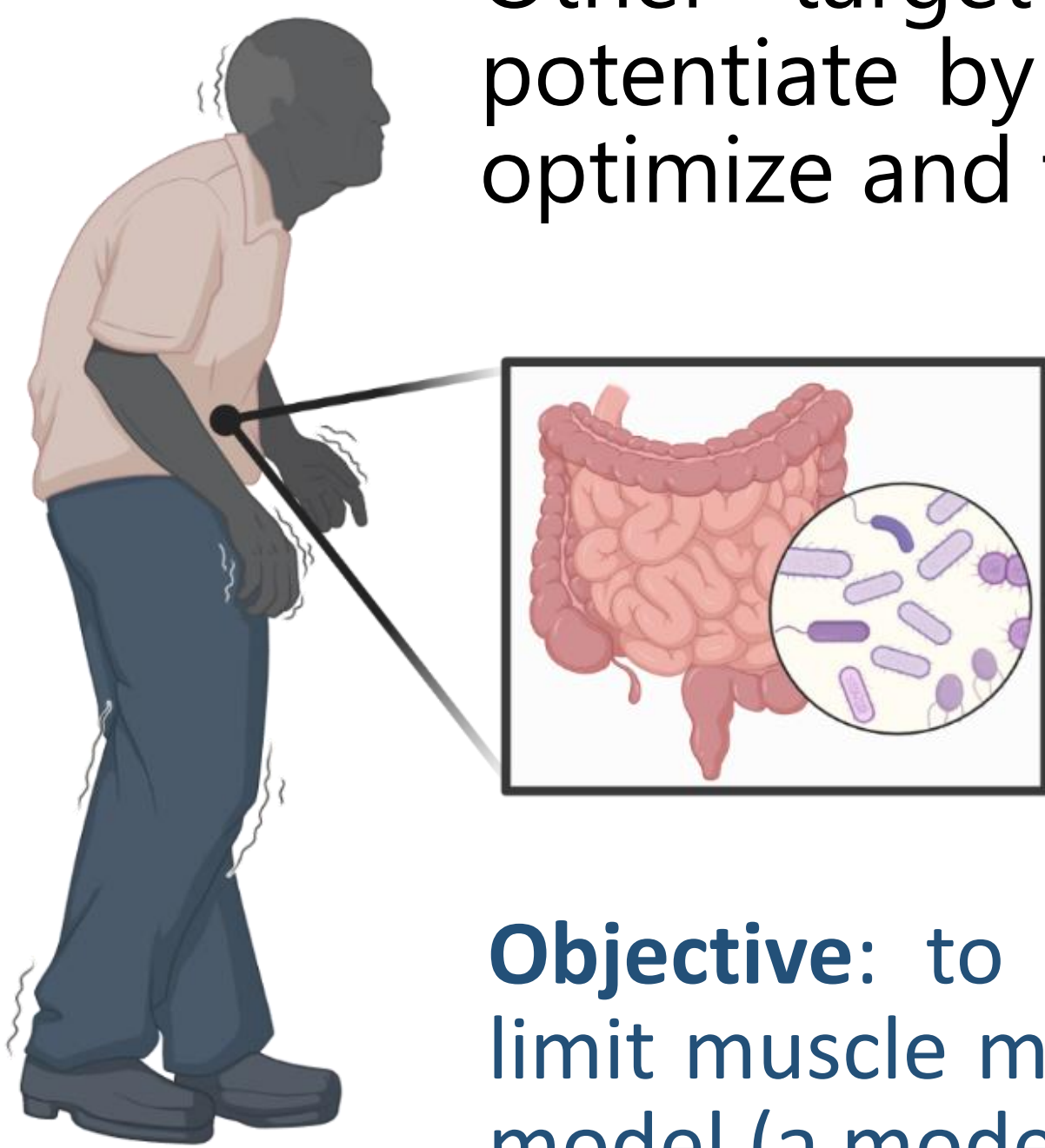
## INTRODUCTION

**Sarcopenia** in undernourished elderly (>20% of hospitalized patients) increases the risk of morbidity and mortality [1].

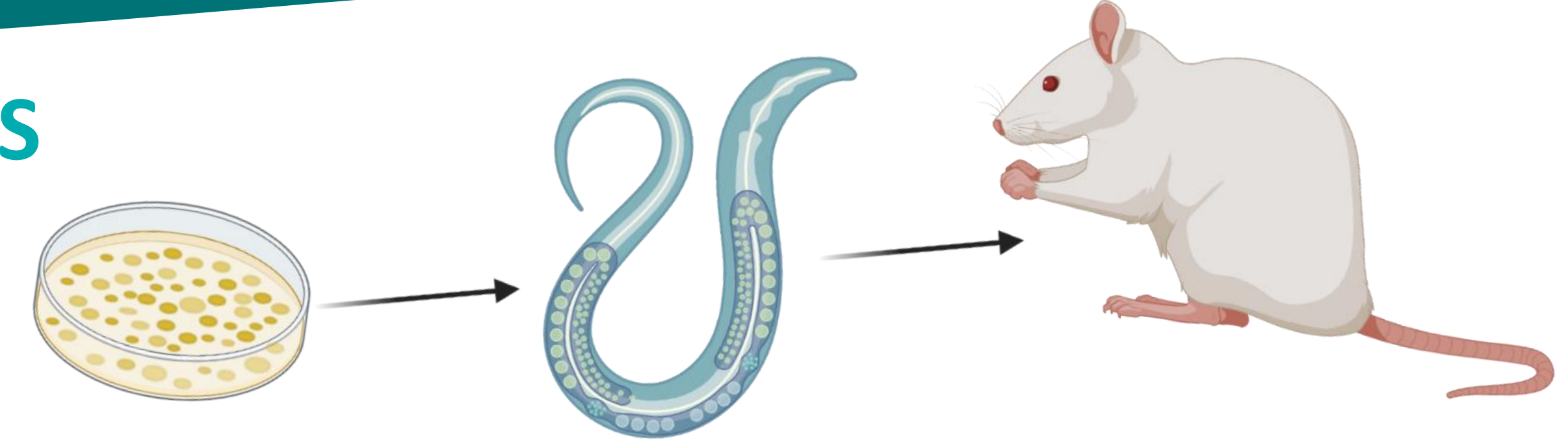
Other target responsible of sarcopenia and potentiate by denutrition have to be identified to optimize and favor multimodal strategies.

The **gut microbiota**, being shown to be altered during aging and denutrition, could represent an interesting and innovative target to consider in the management of sarcopenia [2].

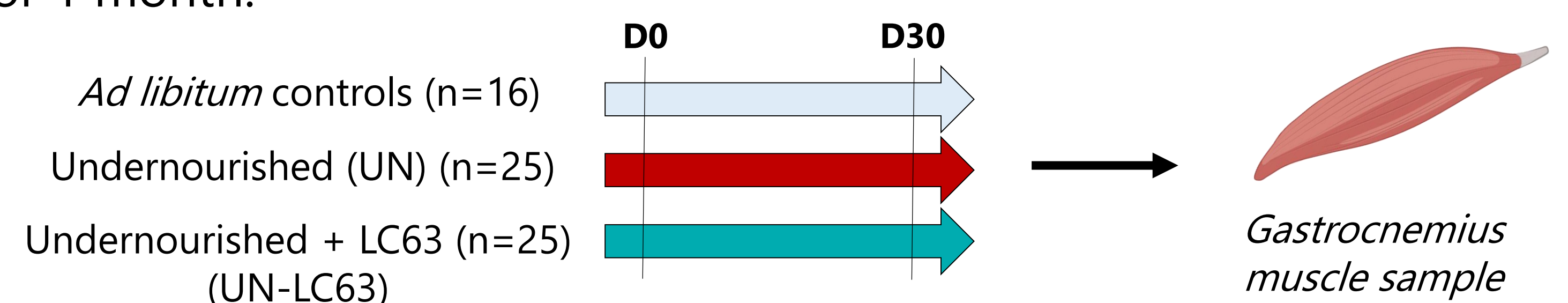
**Objective:** to select a probiotic bacteria capable to limit muscle mass loss in a undernourished old rodent model (a model of frail old population).



## METHODS

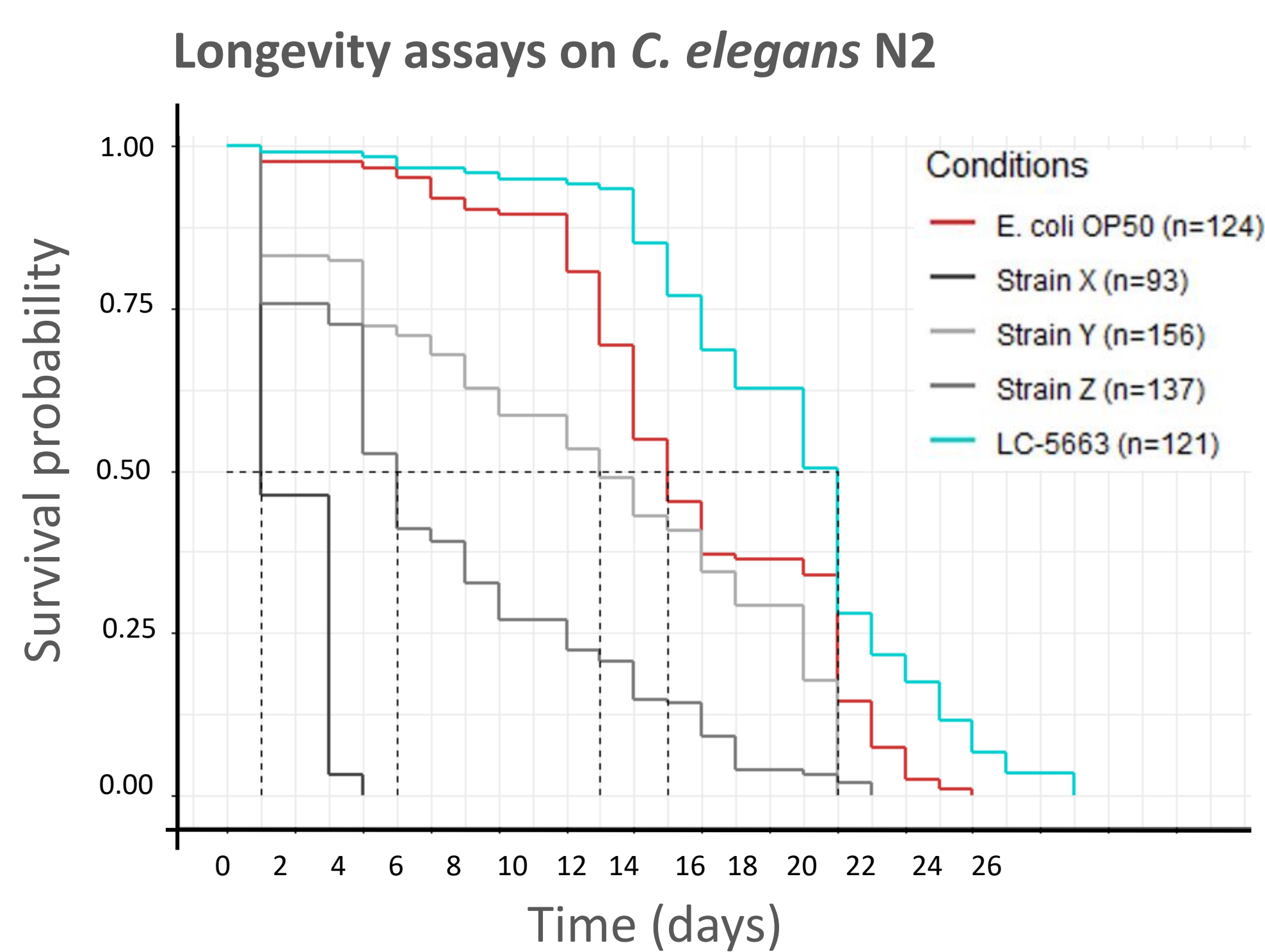


- (1) Isolation of lactic acid bacteria (LAB) from **the gut microbiota of patient with short bowel syndrome (SBS)**, a population that presents adaptations to optimize food efficiency [3];
- (2) screening of isolated bacteria on **Caenorhabditis elegans** model on lifespan and muscle integrity;
- (3) evaluation of daily supplementation of promising strain (~10<sup>9</sup>) in **old rats** (20 mo. ♂) under **mild food restriction** (75% ad libitum) for 1 month.



## RESULTS

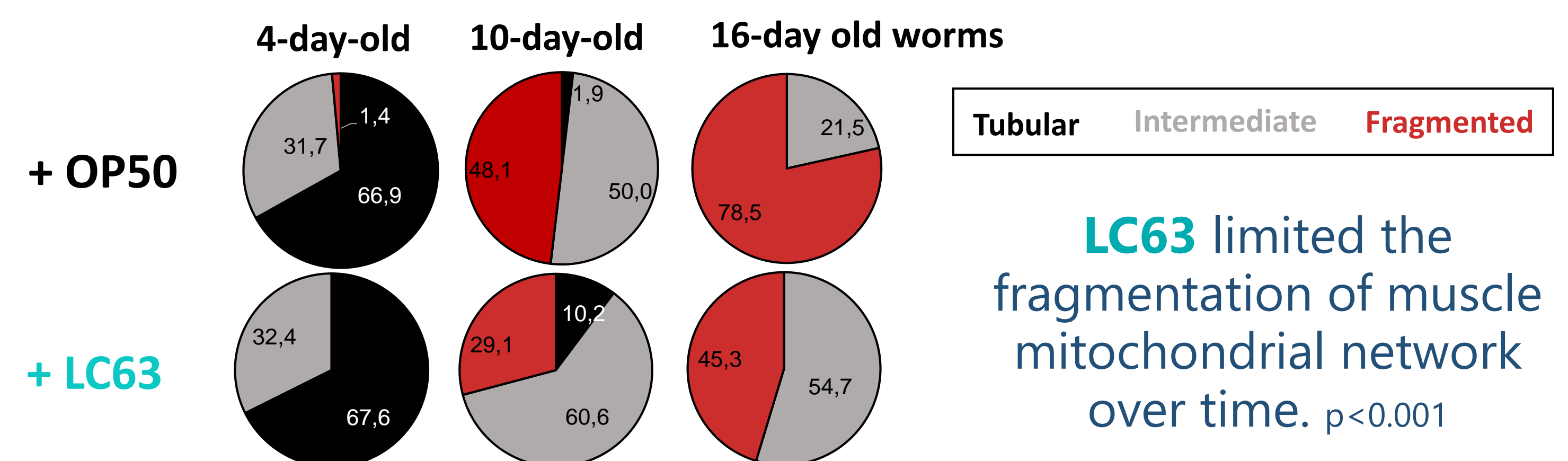
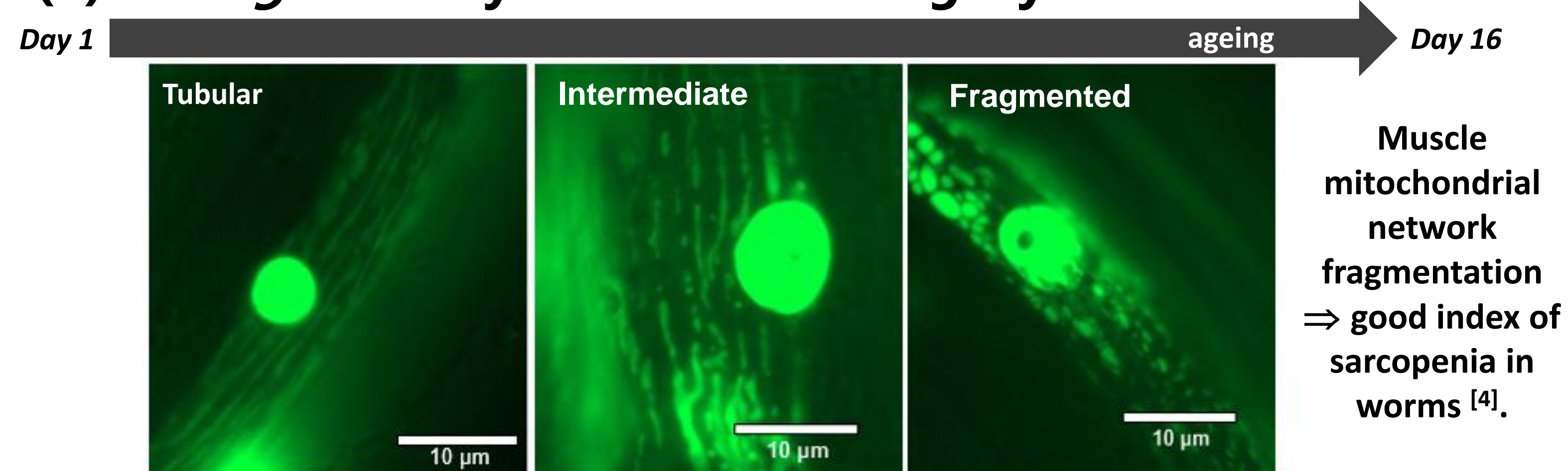
### (1) C. elegans lifespan



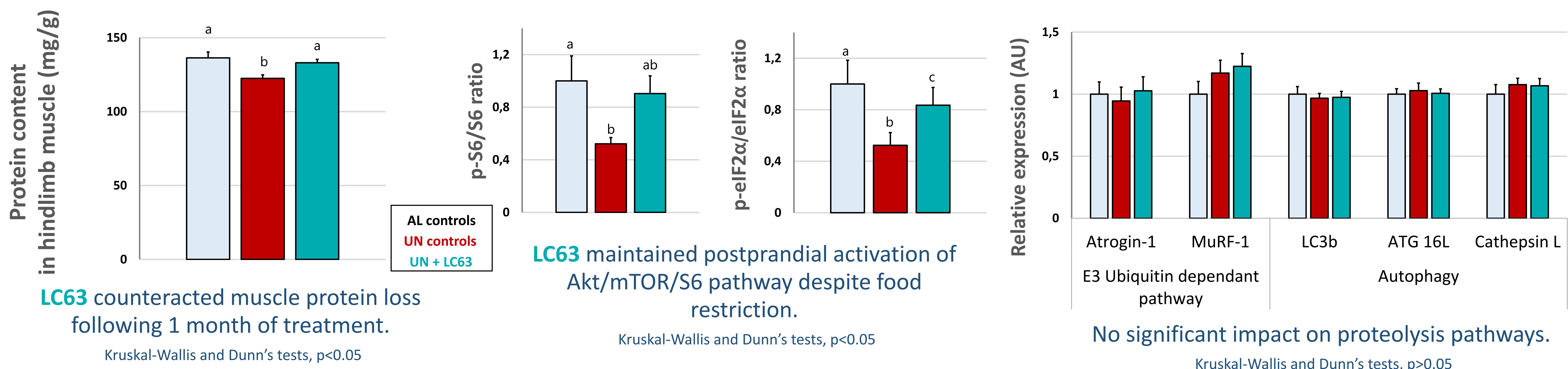
**LC63** increased worm longevity compared to worms fed a control diet (*E. coli* OP50) and other strains.

Log-Rank test,  $p < 0.001$

### (2) C. elegans body wall muscle integrity



### (3) Muscle protein content and turnover



## CONCLUSION

**LC63** (patented strain) prevented muscle mass loss and could represent an interesting strategy to limit sarcopenia.

Future work:

Use of LC-5663 in supplementation strategies in humans presenting sarcopenia.

⇒ Clinical study in old populations required.

Pictures: BioRender.com

[1] Cerri et al., 2015. Clin Nutr

[2] Giron et al., 2022. J Cachexia Sarcopenia Muscle.

[3] Gillard et al., 2017. Front. Physiol.

[4] Gaffney et al., 2018. Aging