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

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INTRODUCTION

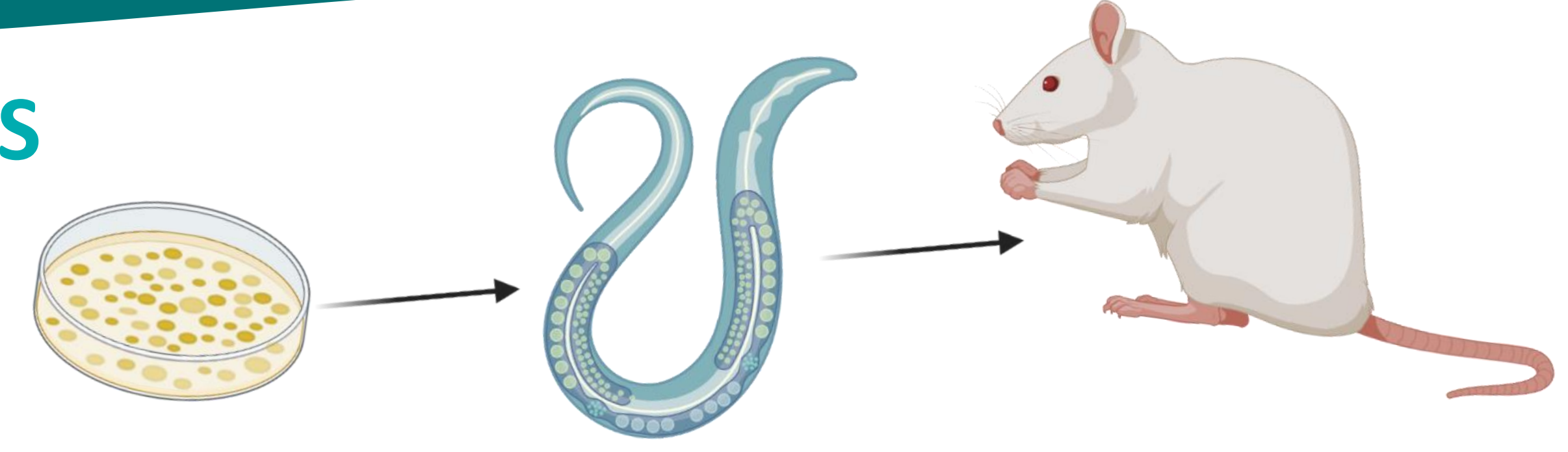
Sarcopenia in undernourished elderly (>20% of hospitalized patients) increases the risk of morbidity and mortality [1].

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

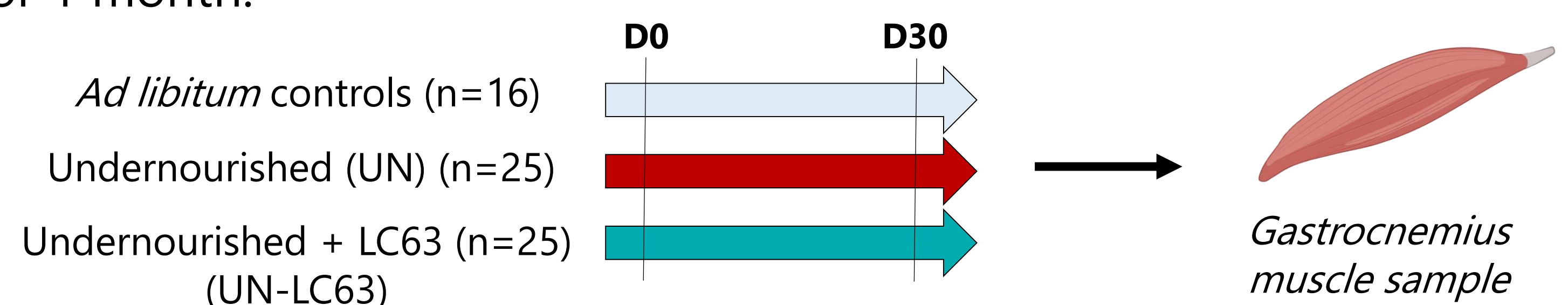
The **gut microbiota**, being shown to be altered during aging and denutrition, could represent an interesting and innovative target to consider in the management of sarcopenia [2].

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

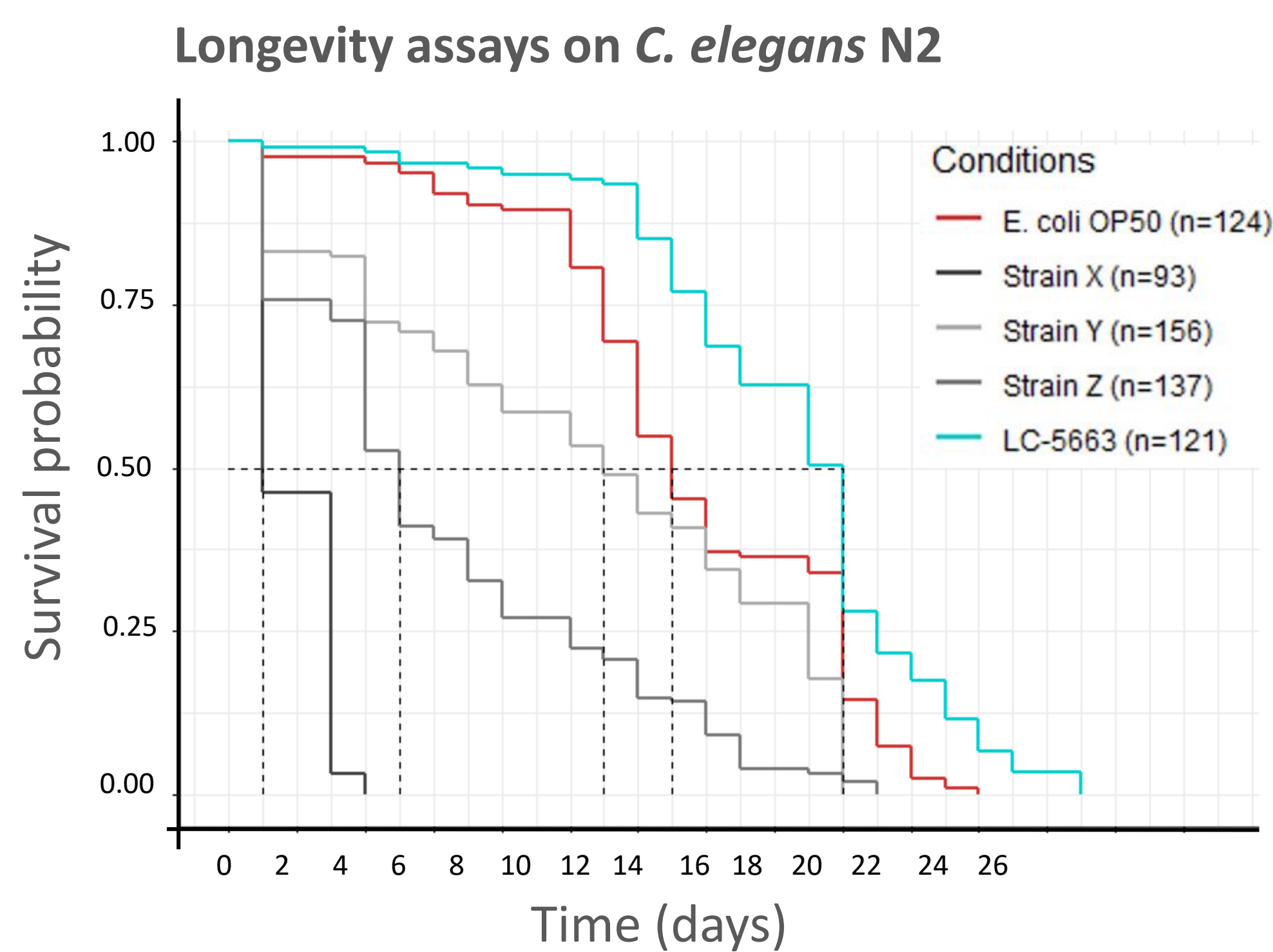


- (1) Isolation of lactic acid bacteria (LAB) from **the gut microbiota of patient with short bowel syndrome (SBS)**, a population that presents adaptations to optimize food efficiency [3];
- (2) screening of isolated bacteria on ***Caenorhabditis elegans*** model on lifespan and muscle integrity;
-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



RESULTS

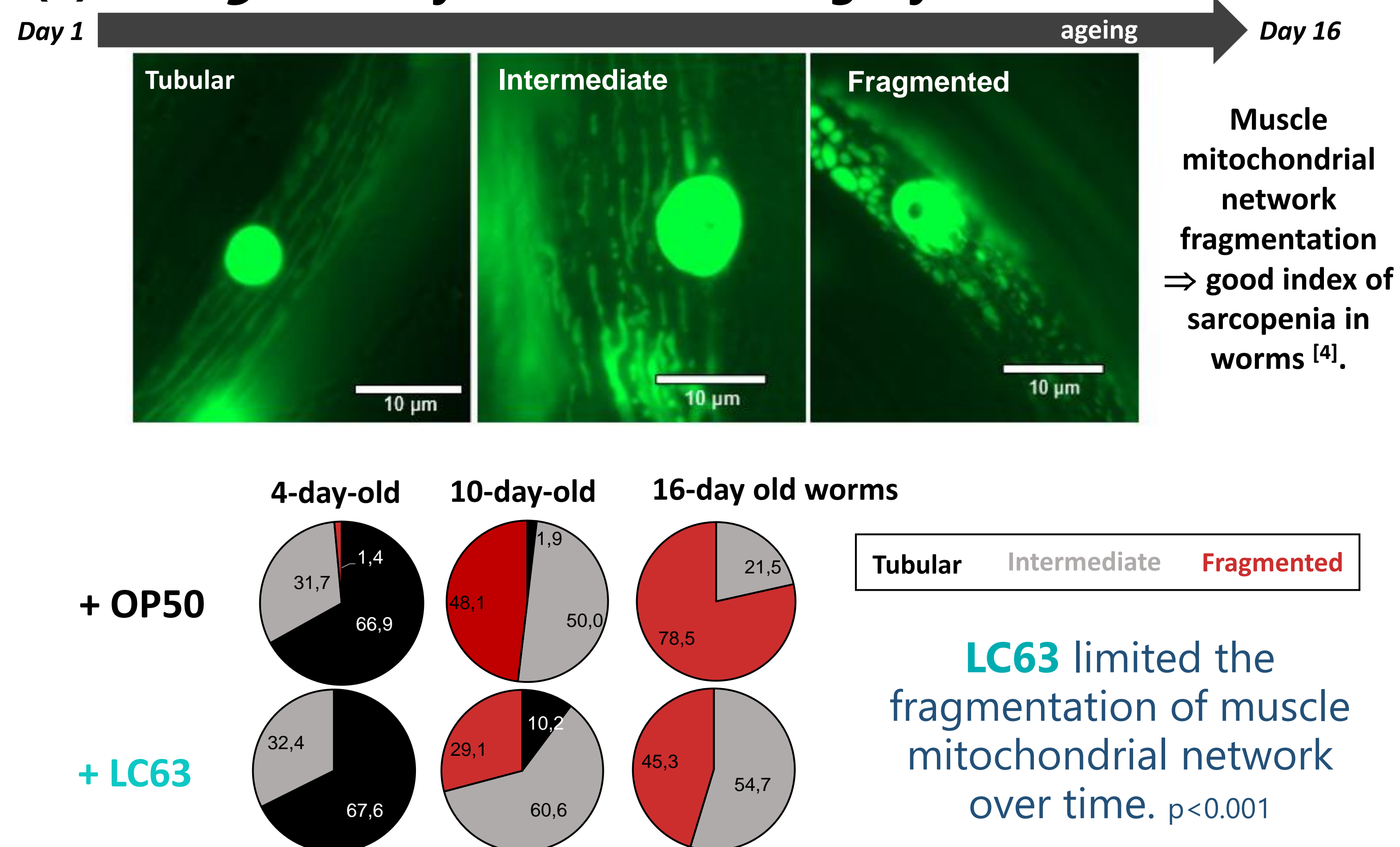
(1) *C. elegans* lifespan



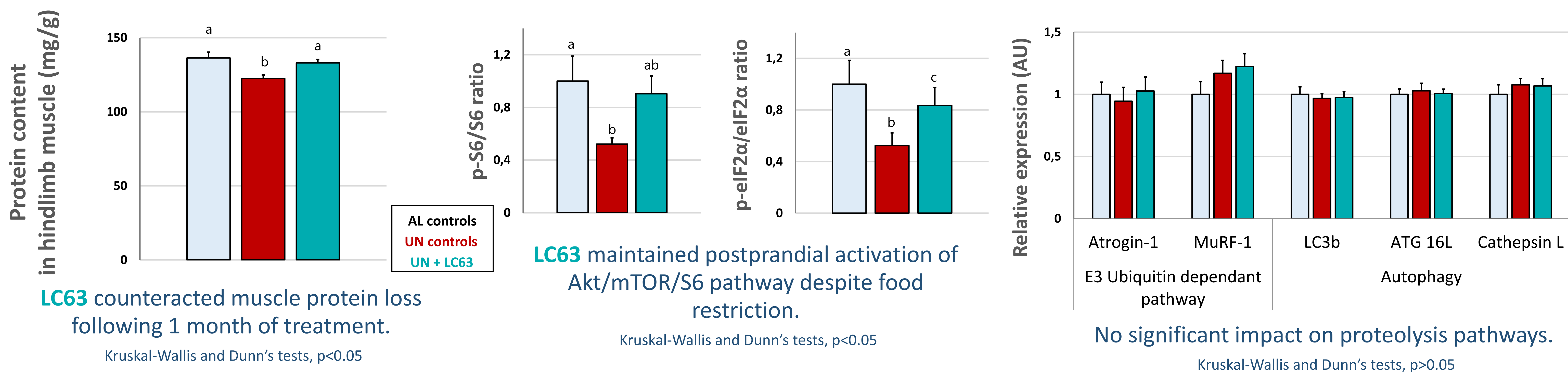
LC63 increased worm longevity compared to worms fed a control diet (*E. coli* OP50) and other strains.

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.

\Rightarrow 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*