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The problem....

Alternative protein sources of low ecological footprint and at affordable prices for fish feed formulation are key to the sustainable development of aquaculture. Nevertheless, they often impact fish physiology and metabolism due to the presence of phytoestrogens. The demonstrated negative effect of phytoestrogens on white muscle development and growth highlights the **need for tools** to screen for potential myostatic action of raw materials and fish feeds.

Objective

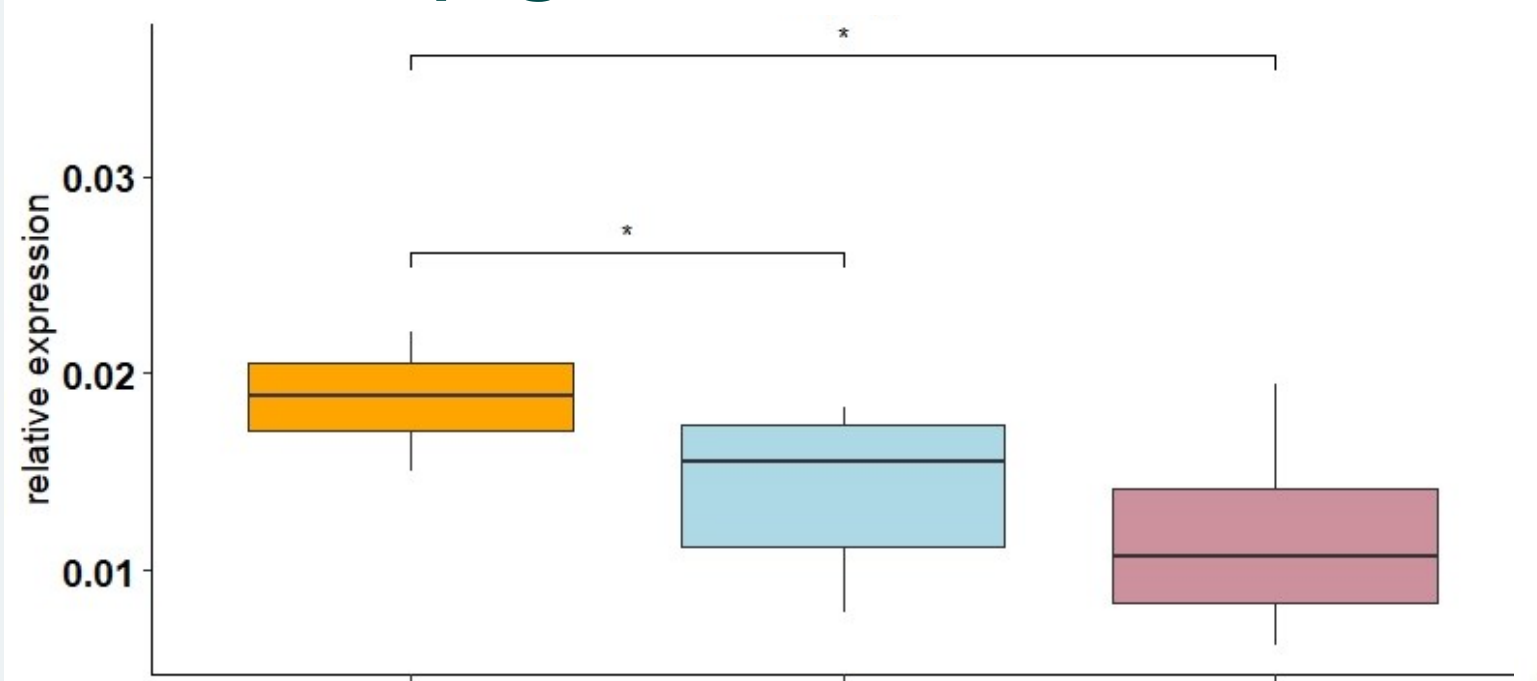
This study combines *in vivo* and *in vitro* approaches to validate white muscle gene markers in the gilthead seabream as indicators of compromised myogenesis when fed alternative protein sources.

Results

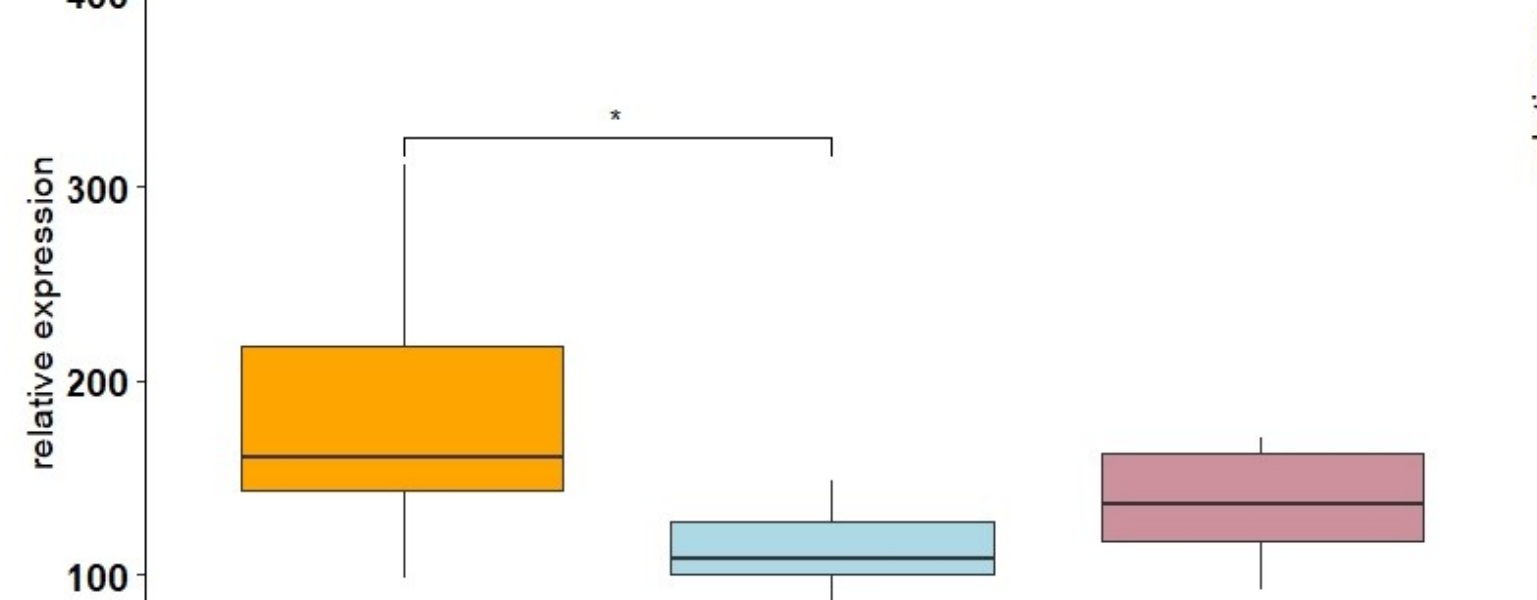
In vivo



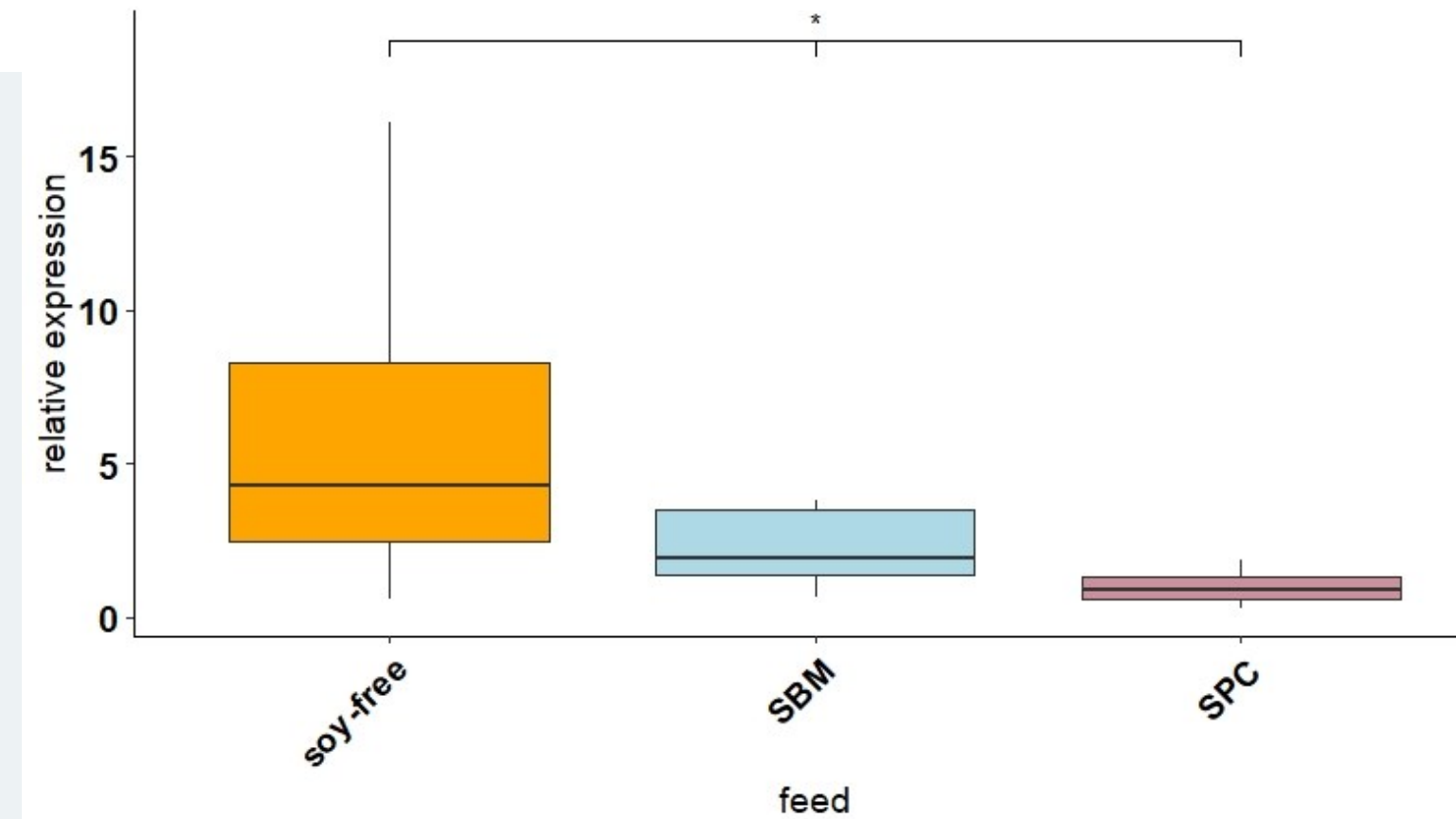
Myogenin: differentiation



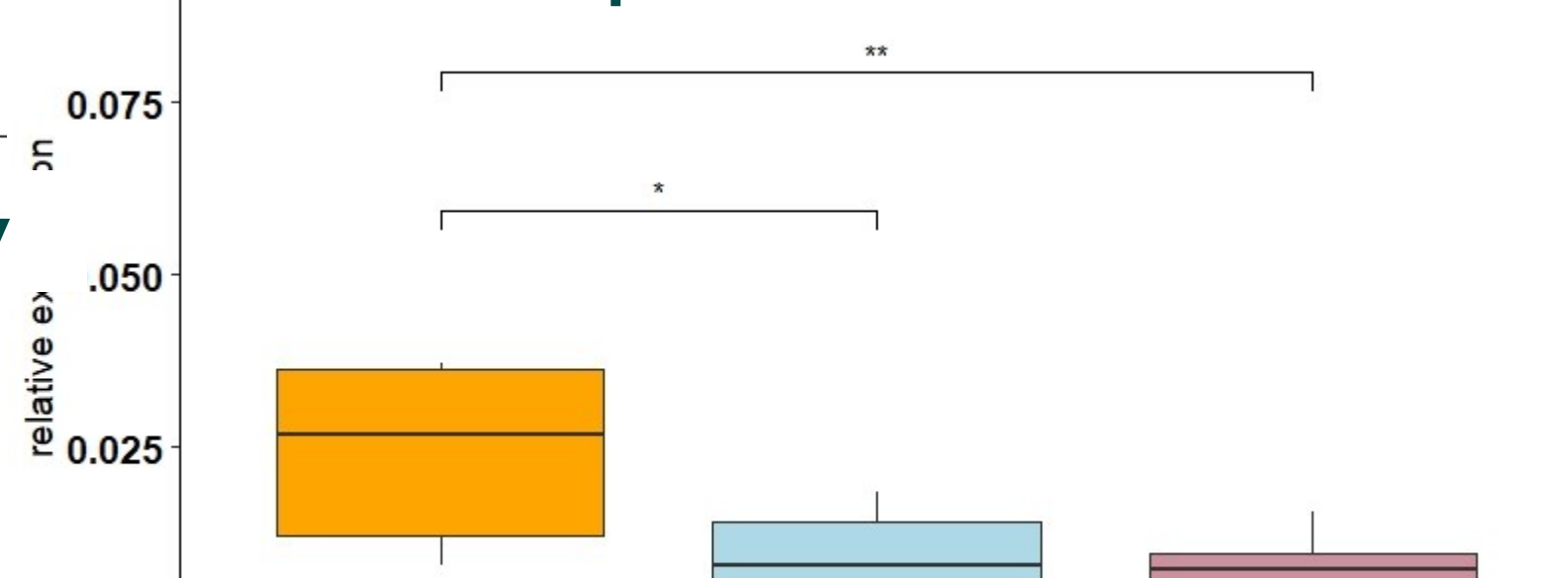
Myosin light chain 2a: hypertrophy



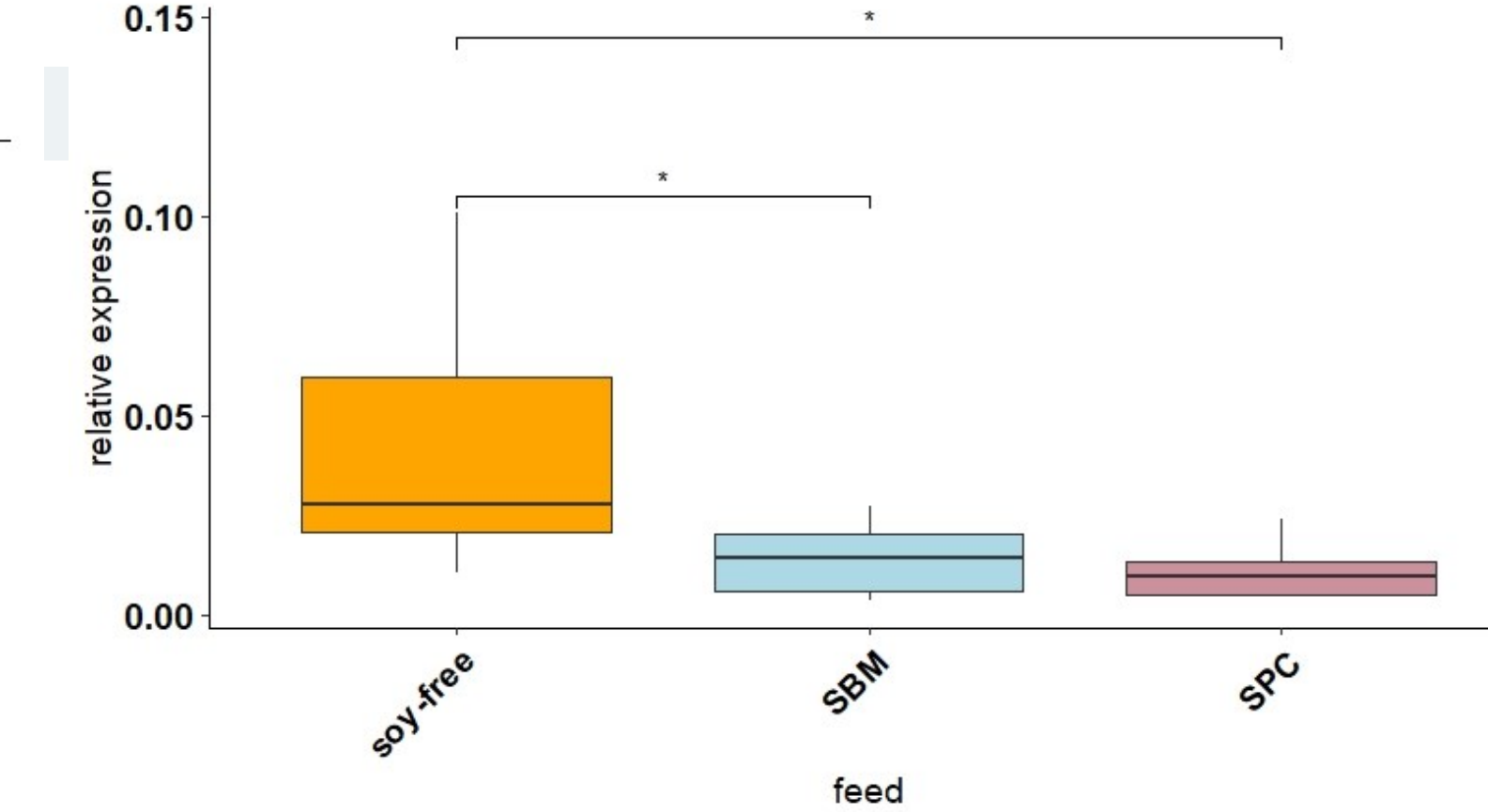
Myosin light chain 2b: hyperplasia



Hormone sensitive lipase: lipid mobilization



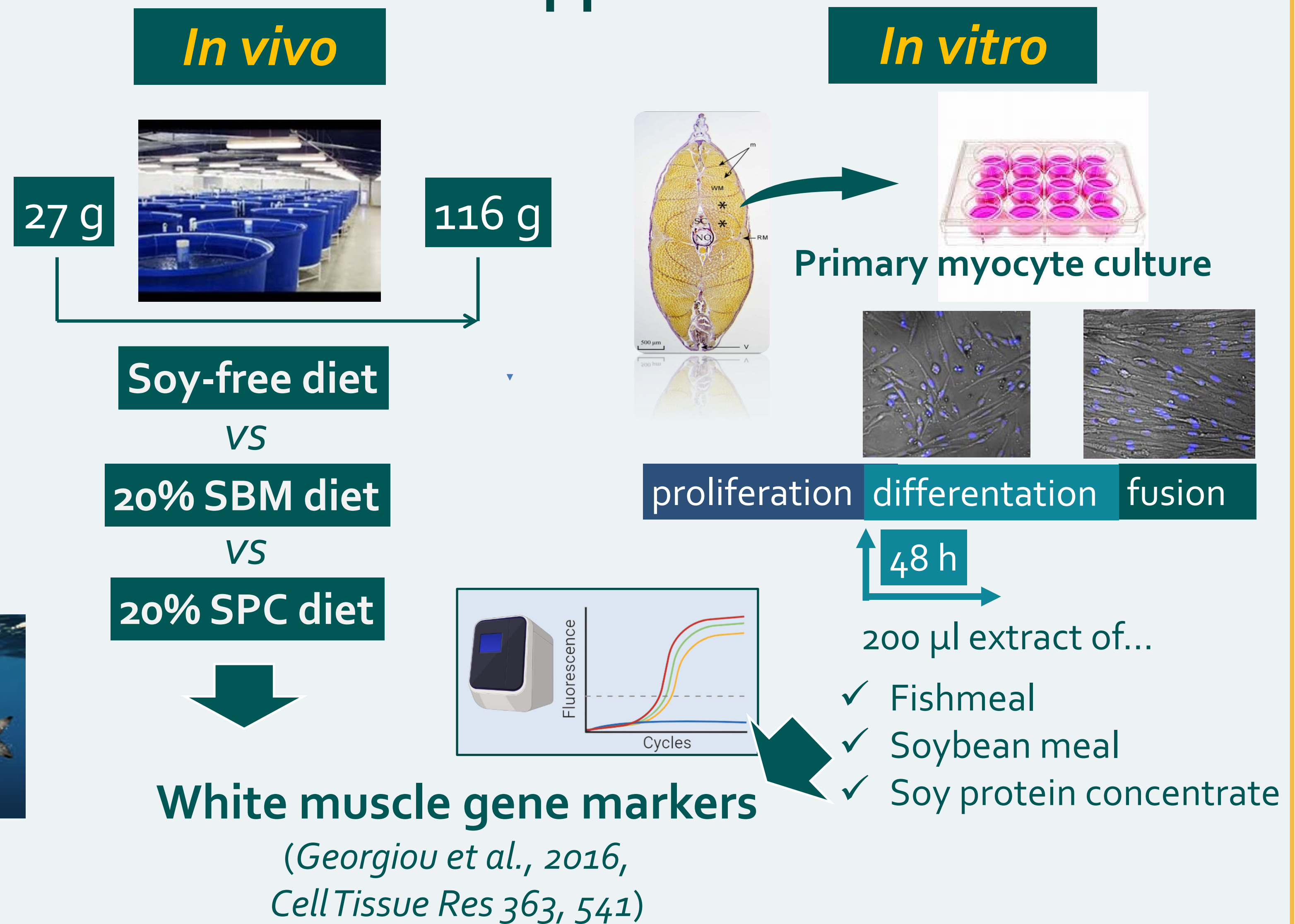
Lipoprotein lipase: lipid storage



Conclusions

- ➔ Inclusion of soy in the diet in the form of SBM or SPC had a significant effect on white muscle gene markers of hyperplasia and hypertrophy as well as lipid metabolism
- ➔ Primary myocyte cultures can be a useful tool in screening for myostatic activity of fish feed raw materials

Approach



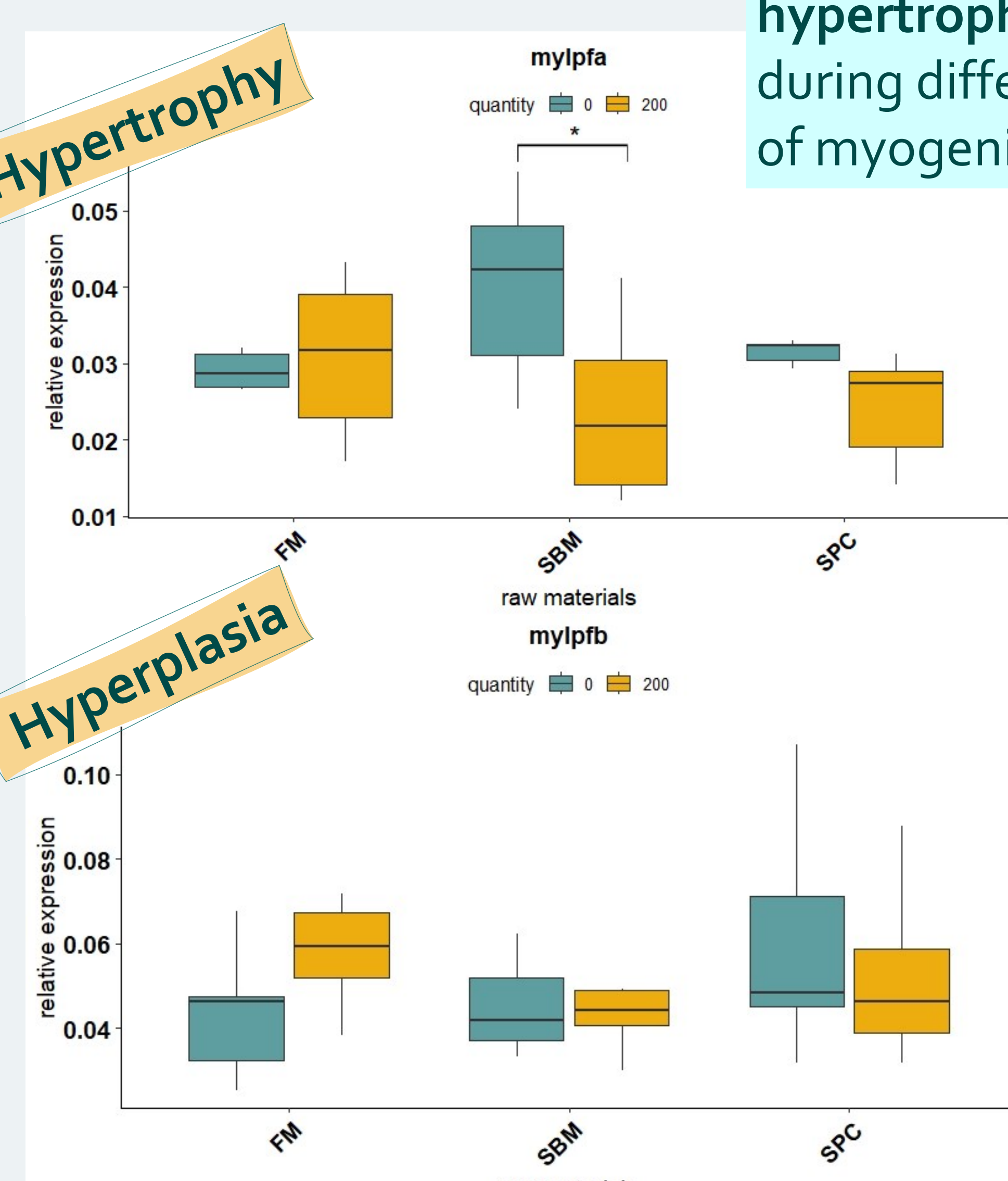
Results

In vitro

SBM significantly suppressed hypertrophy marker during differentiation of myogenic cells

Hypertrophy

Hyperplasia



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