Molecular weight analysis of *M. merluccius* and *P. glauca* collagen by LS-GPC: effect of temperature/stirring time on solubility

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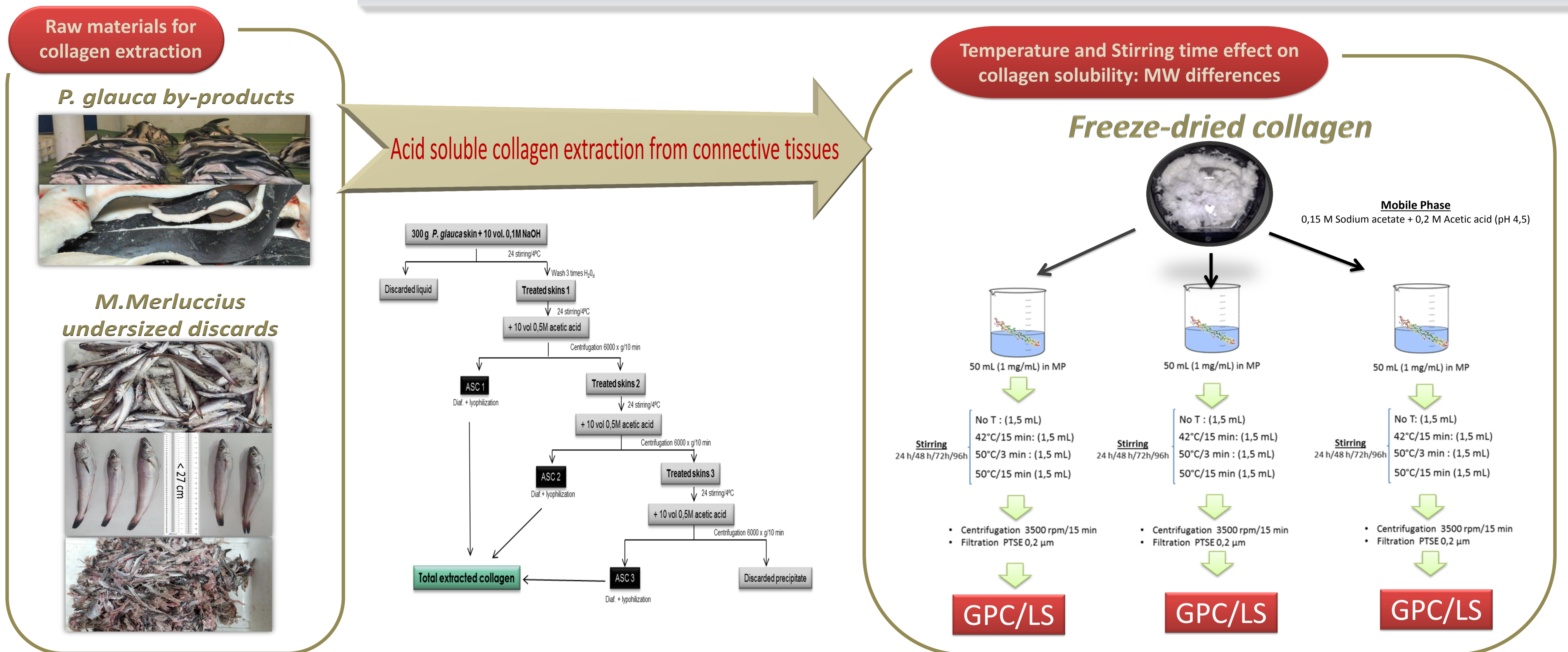E-mail: mblanco@iim.csic.es

INTRODUCTION AND OBJECTIVE

• The new reform of the **Common Fisheries Policy (CFP)** and other EU policy marine approaches such as **Blue Growth** and **2020 EU strategy** are focused on the development of a sustainable **socioeconomic and environmental growth** in the marine and maritime EU region. To achieve this goal the **valorization** and **biotechnological transformation** of raw marine materials (**discards and by-products**) for the isolation of **valuable biocompounds** useful for different applications might be crucial. *Merluccius merluccius* discards due to **Minimum Landing Size restrictions** imposed by the Landing Obligation included in the new CFP and *Prionace glauca* skin byproducts are susceptible to be valorized based on the higher collagen content of its connective tissues.

• The **aim of this work** was to study and compare the effect of temperature and stirring time conditions on the solubility of *P. glauca* collagen and *M. merluccius* collagen in mobile phase using GPC-LS to determine molecular weight differences.
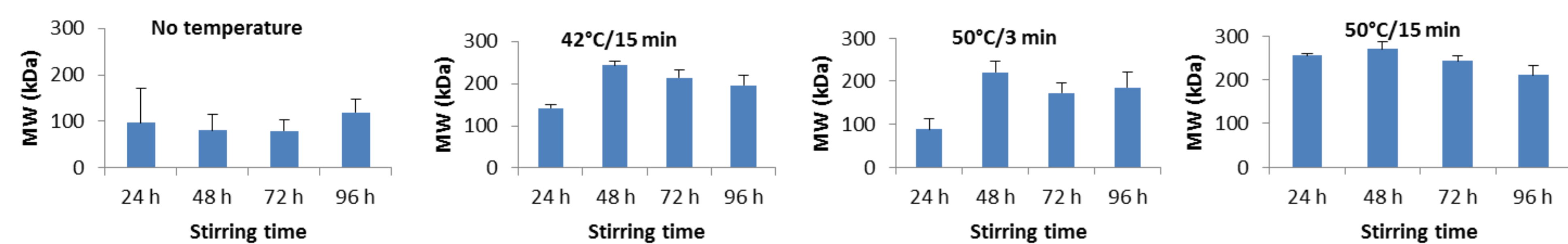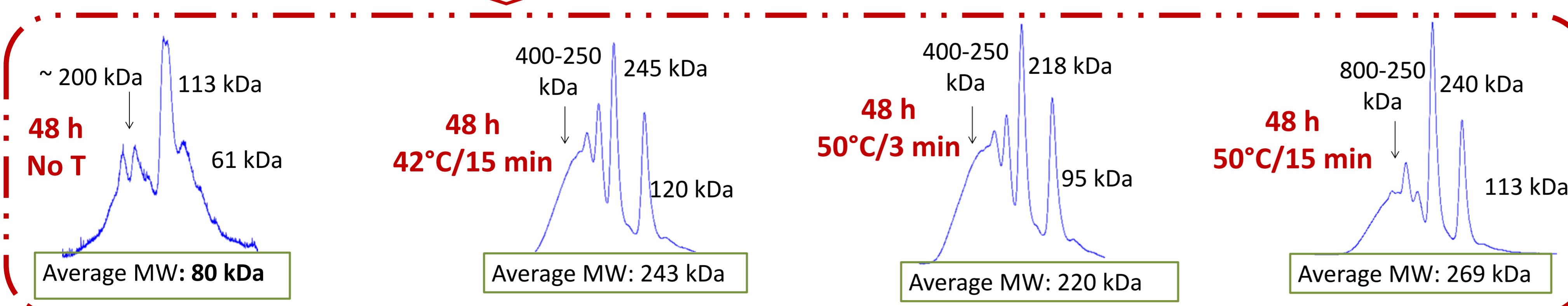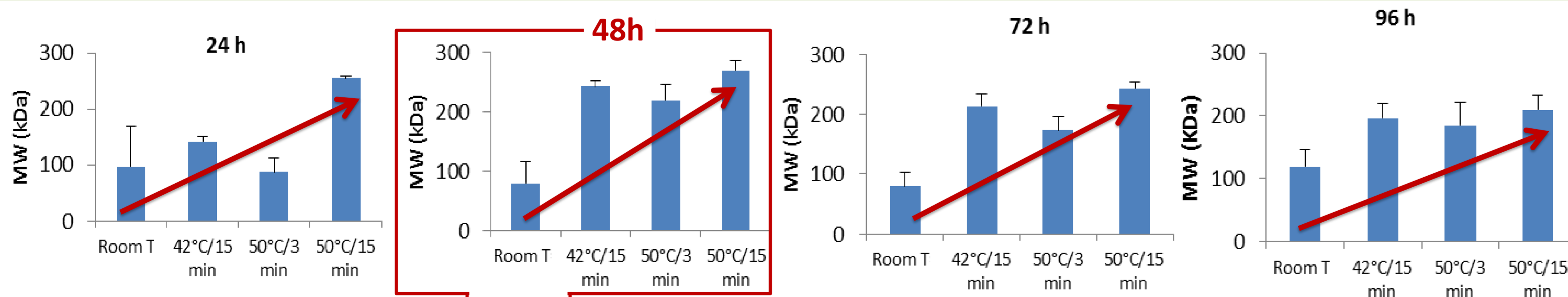
Sustainability through innovation

EXPERIMENTAL WORK

Raw materials for collagen extraction

P. glauca by-products

M.Merluccius undersized discards

Acid soluble collagen extraction from connective tissues

Temperature and Stirring time effect on collagen solubility: MW differences

Freeze-dried collagen

Mobile Phase
0,15 M Sodium acetate + 0,2 M Acetic acid (pH 4,5)

50 mL (1 mg/mL) in MP

No T : (1,5 mL)
42°C/15 min: (1,5 mL)
50°C/3 min : (1,5 mL)
50°C/15 min (1,5 mL)

Stirring
24 h/48 h/72h/96h

• Centrifugation 3500 rpm/15 min
• Filtration PTSE 0,2 μm

GPC/LS

RESULTS AND CONCLUSIONS

P. glauca: Stirring time effect

P. glauca: Temperature effect

~ 200 kDa — 113 kDa — 61 kDa — **48 h No T** — Average MW: **80 kDa**

400-250 kDa — 245 kDa — 120 kDa — **48 h 42°C/15 min** — Average MW: 243 kDa

400-250 kDa — 218 kDa — 95 kDa — **48 h 50°C/3 min** — Average MW: 220 kDa

800-250 kDa — 240 kDa — 113 kDa — **48 h 50°C/15 min** — Average MW: 269 kDa

M. merluccius:

There is no influence of temperature and stirring time effect on *M. merluccius* collagen solubility in mobile phase.

P. glauca:

• No effect of stirring time increments is observed on the solubility of collagen if no temperature is applied
• There is a positive effect of temperature on solubilization of high MW components in all the stirring times analyzed.
• Higher MW components are observed after 48h stirring and when 50°C is applied for 15 minutes just after.
• Higher MW components are obtained after 48h of stirring in the temperatures/incubation times assayed.

ACKNOWLEDGEMENTS