

Protein and peptides extraction from fish by-products

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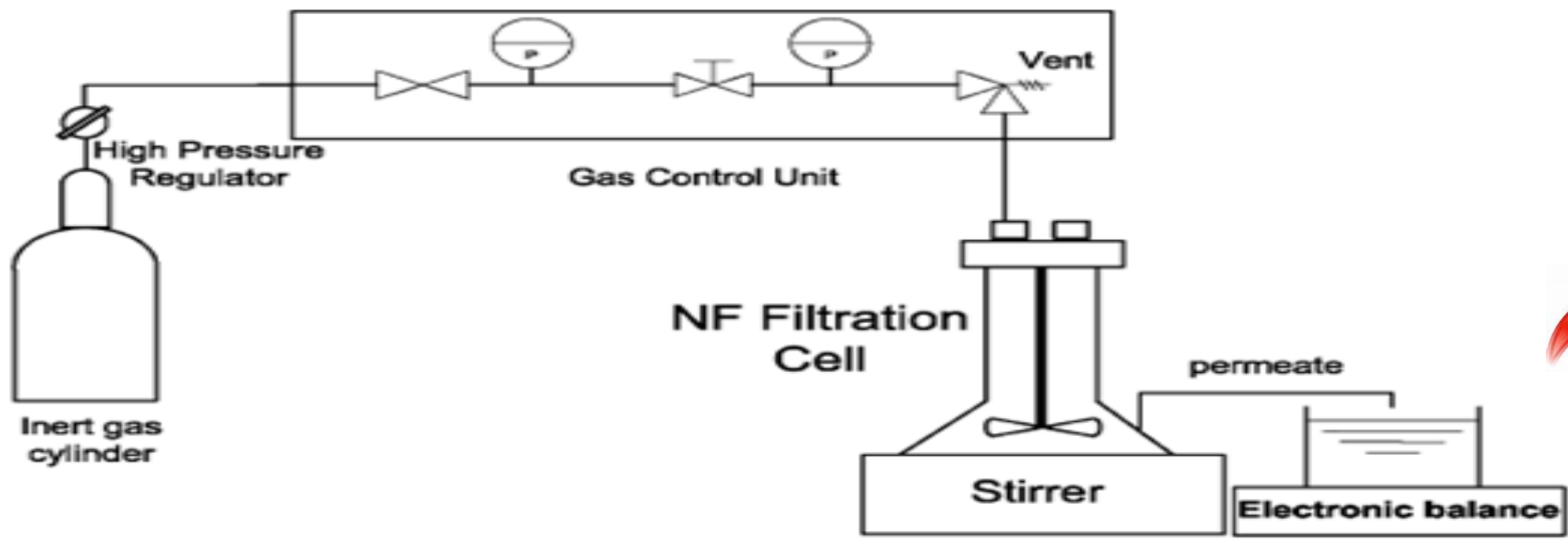


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Introduction

With the rise in awareness of the association between diet and health, there has been an increase in the research focused on the identification of natural bioactive compounds (such as proteins/peptides) that may exhibit some beneficial health effect and consequently be used as functional ingredients [2]. Byproducts represent a sustainable, environmentally-friendly and relatively low cost source of bioactive ingredients. Fishery bioactive peptides, given their structures and amino acid composition, have been shown to display a wide range of biological functions including antioxidant, antimicrobial, opioid agonistic, prebiotic, mineral binding, anti-thrombotic or hypocholesterolemic effects [1, 3]. This work aimed to produce and characterize potentially bioactive peptide fractions from cod blood obtained by membrane processing using sequence of membranes with molecular weight cut-offs (MWCOs) of 50 and then 2.5 kDa, aiming at obtaining a fraction enriched in proetins and peptides with MW between 50 and 2.5 kDa . Moreover, sardine cooking water was processed by a sequence of membranes with (MWCOs) of 2.5 and then 1 kDa, aiming at obtaining: (1) a fraction enriched in peptides with MW between 2.5 and 1 kDa and (2) a fraction enriched in peptides with MW below 1 kDa.

Methods



Results

FPLC profile of cod blood, first step

Fig1. Cod blood, UP010 membrane (10 kDa)

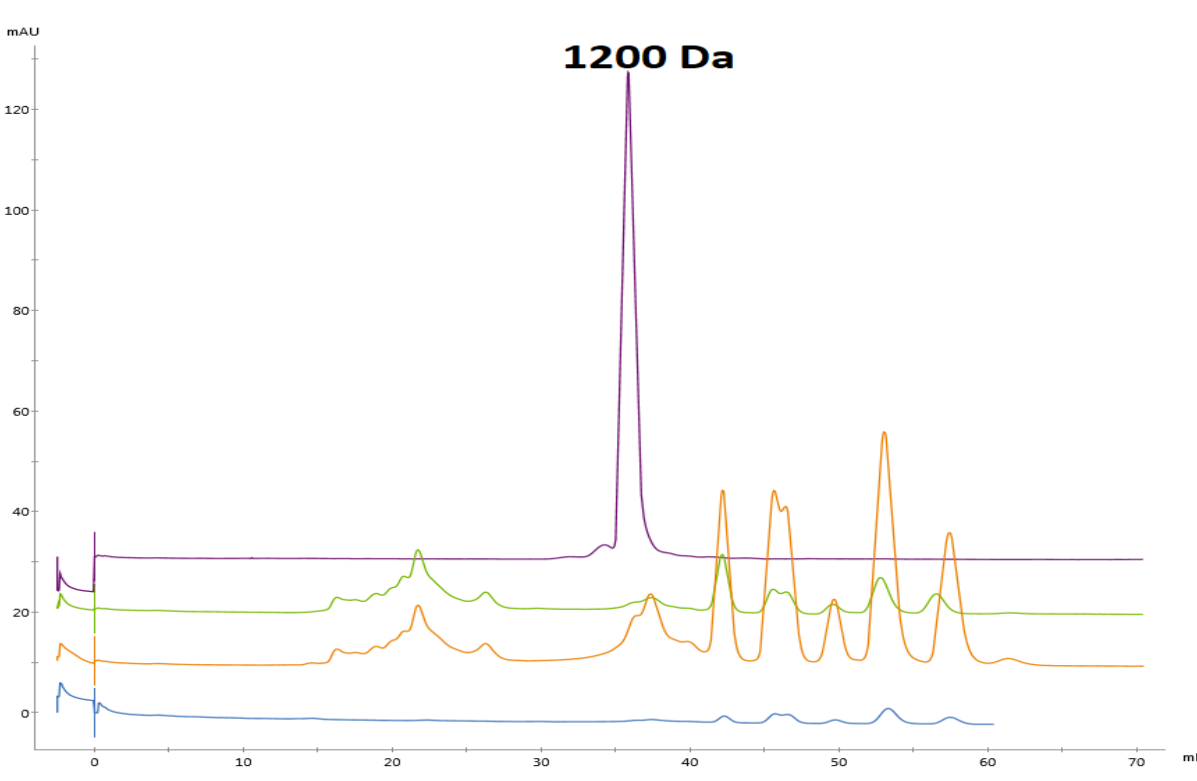


Fig2. Cod blood, MW membrane (20 kDa)

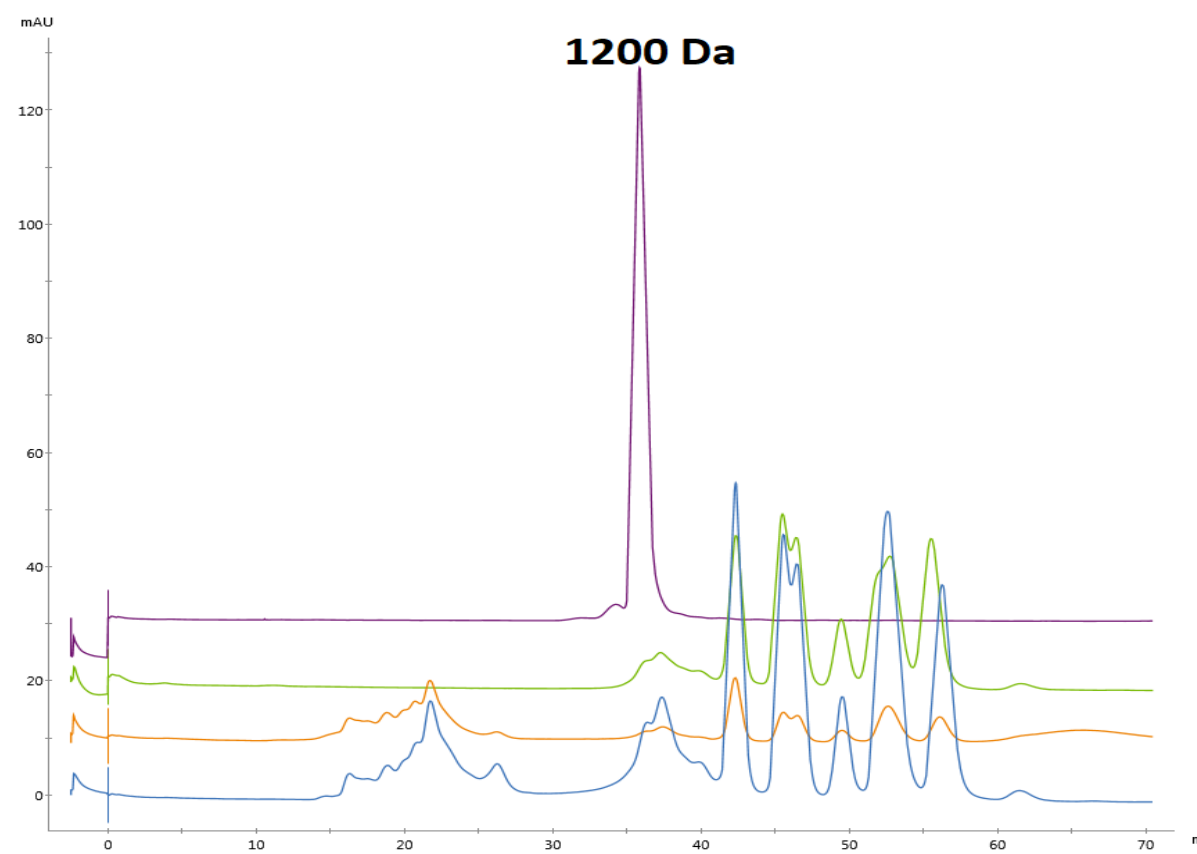
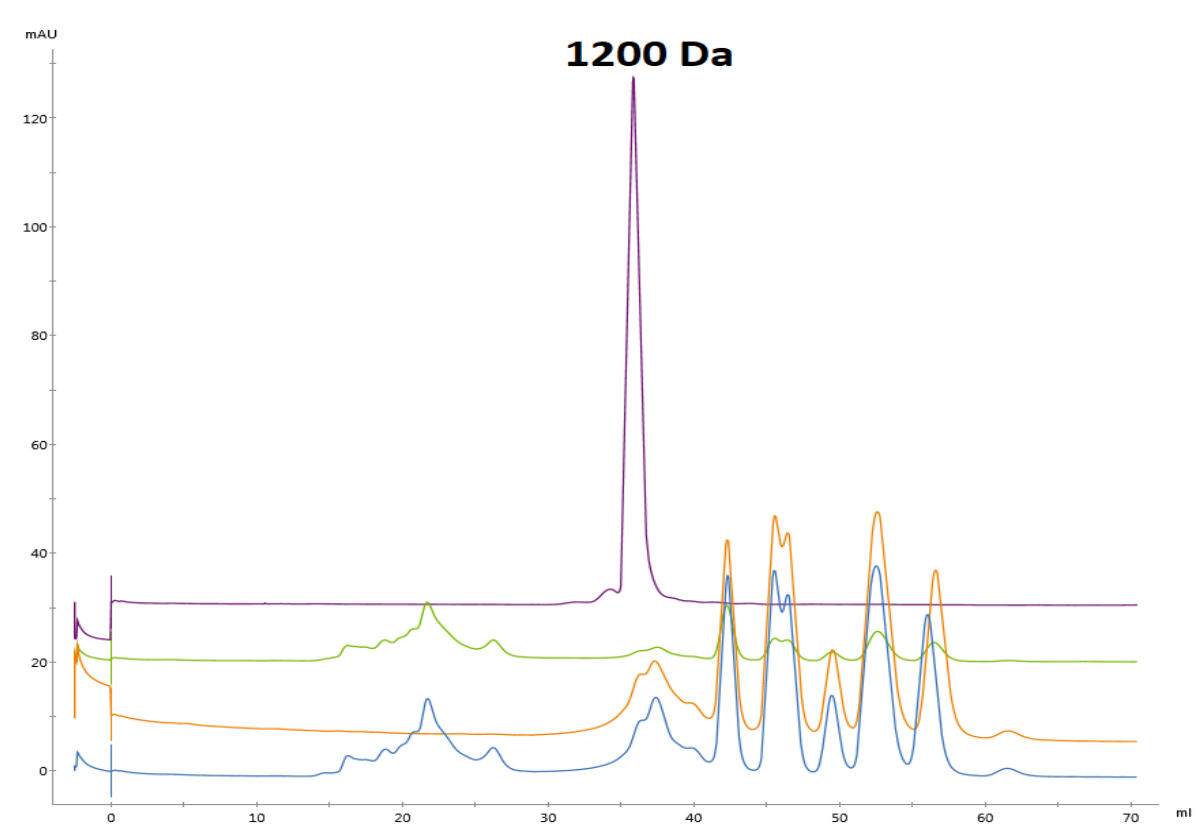


Fig3. Cod blood, PW membrane (50 kDa)



FPLC profile of cod blood, second step

Fig4. Cod blood, GH (UP010), (2.5 kDa)

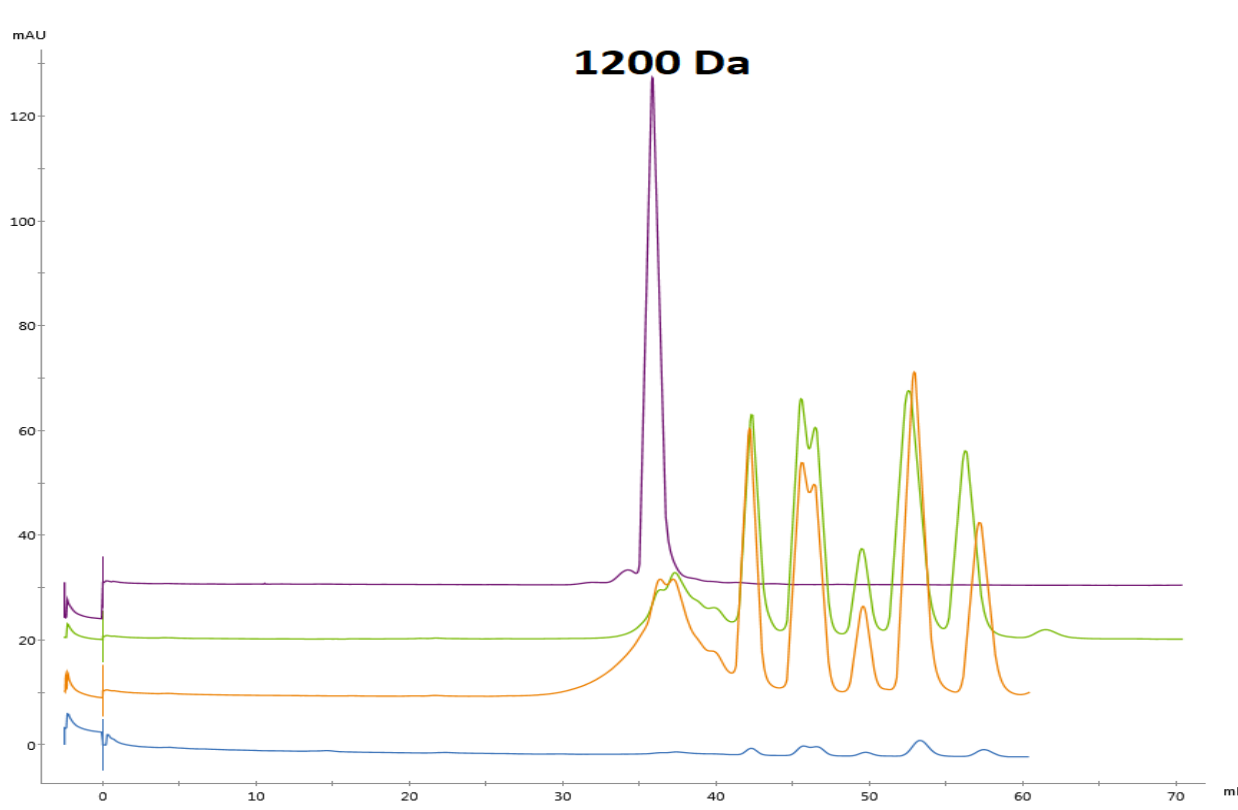


Fig5. Cod blood, GH (MW), (2.5 kDa)

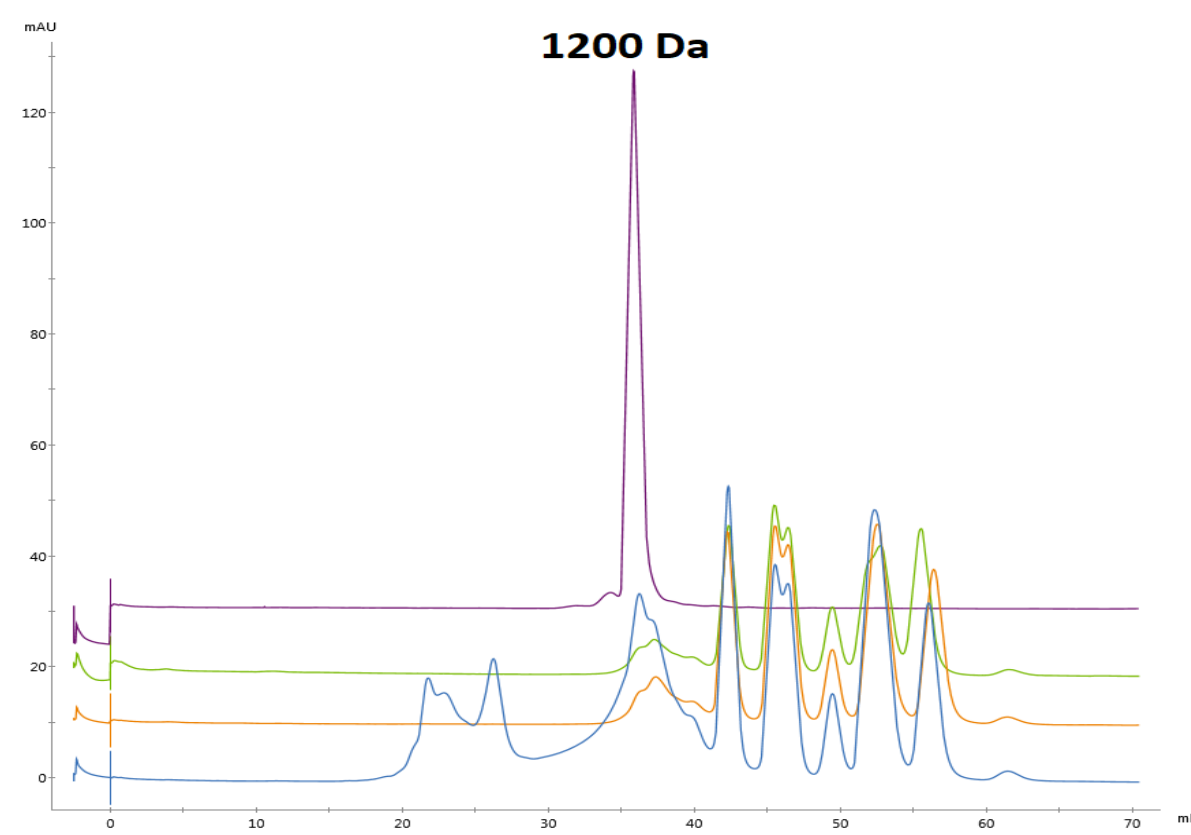
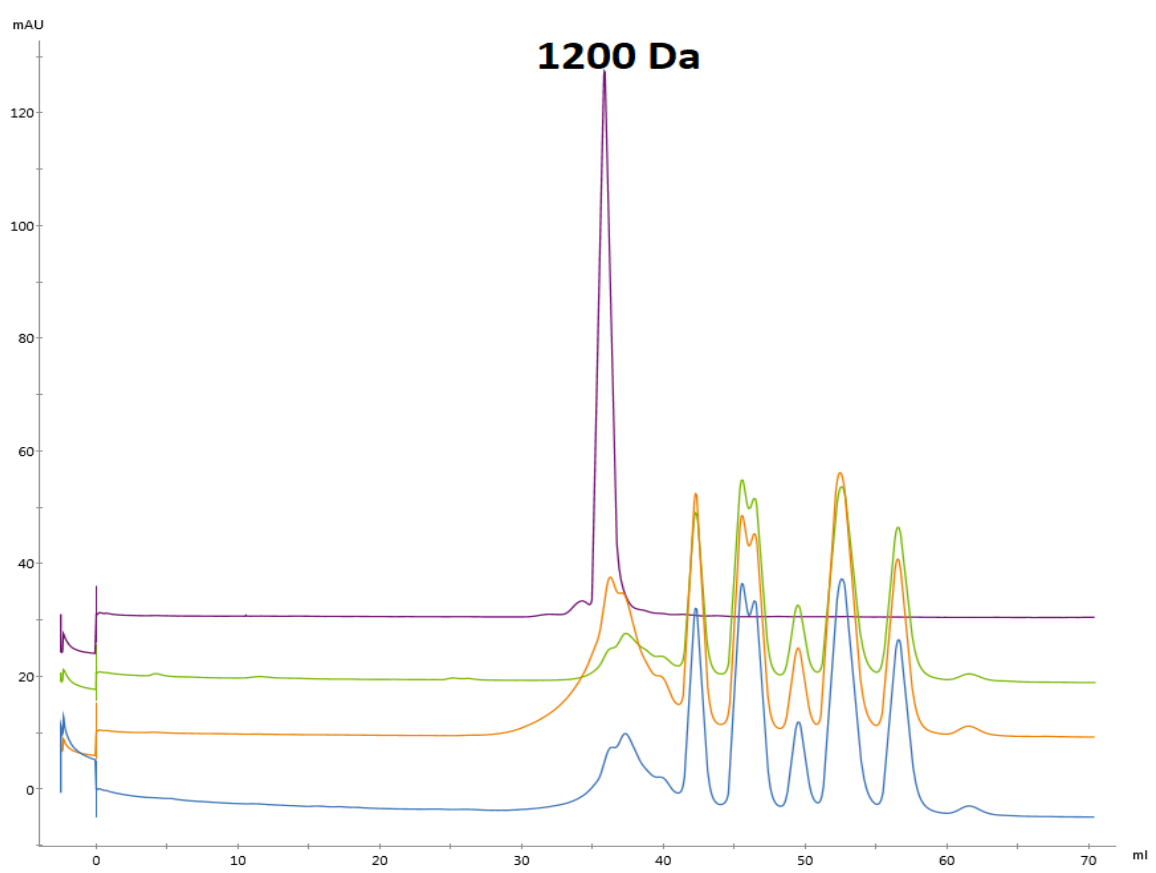


Fig6. Cod blood, GH (PW), (2.5 kDa)



FPLC profile of sardine cooking water, first step

Fig7. Cooking water, GH, (2.5 kDa)

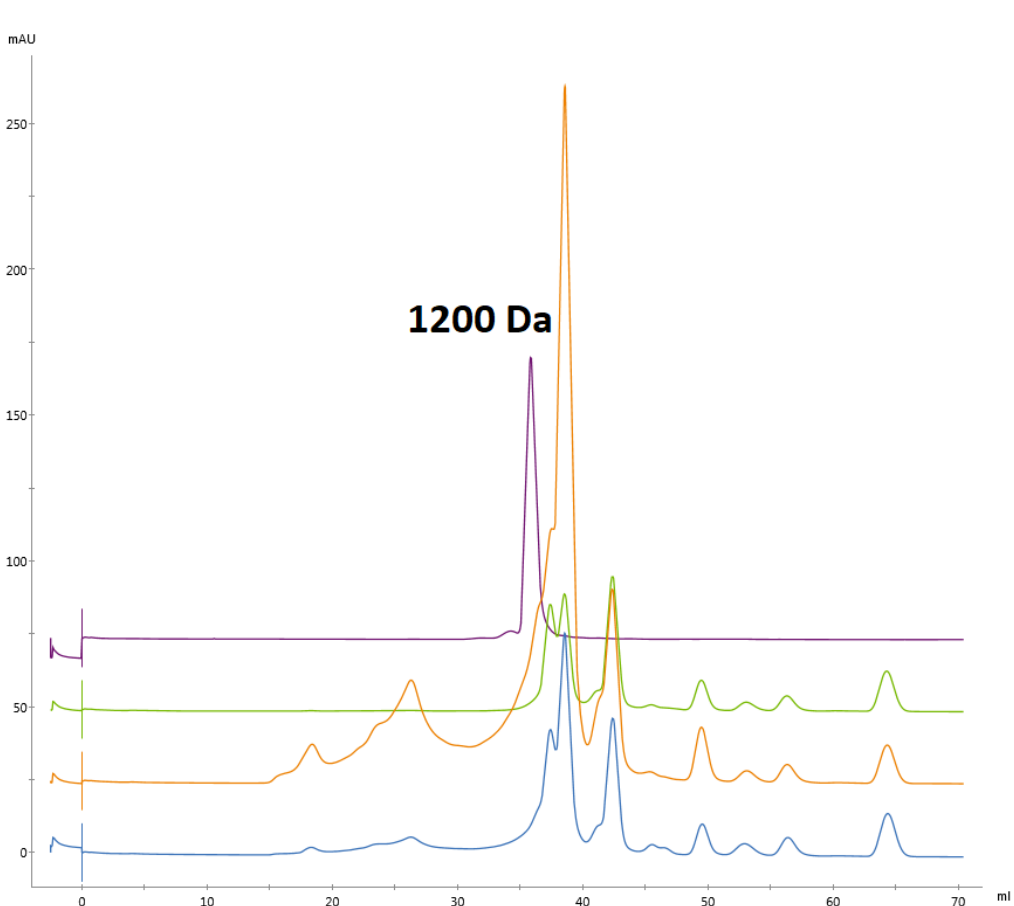


Fig8. Cooking water, GE, (1 kDa)

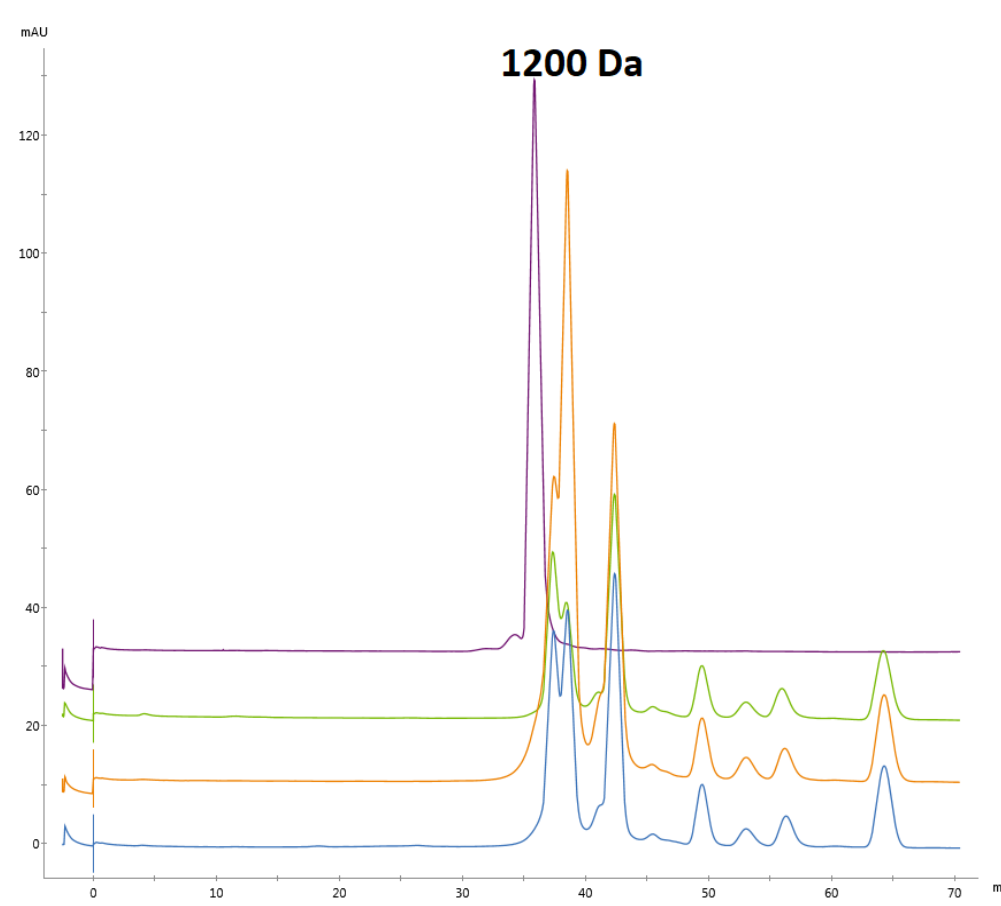


Fig9. Cooking water, GH, (2.5 kDa)

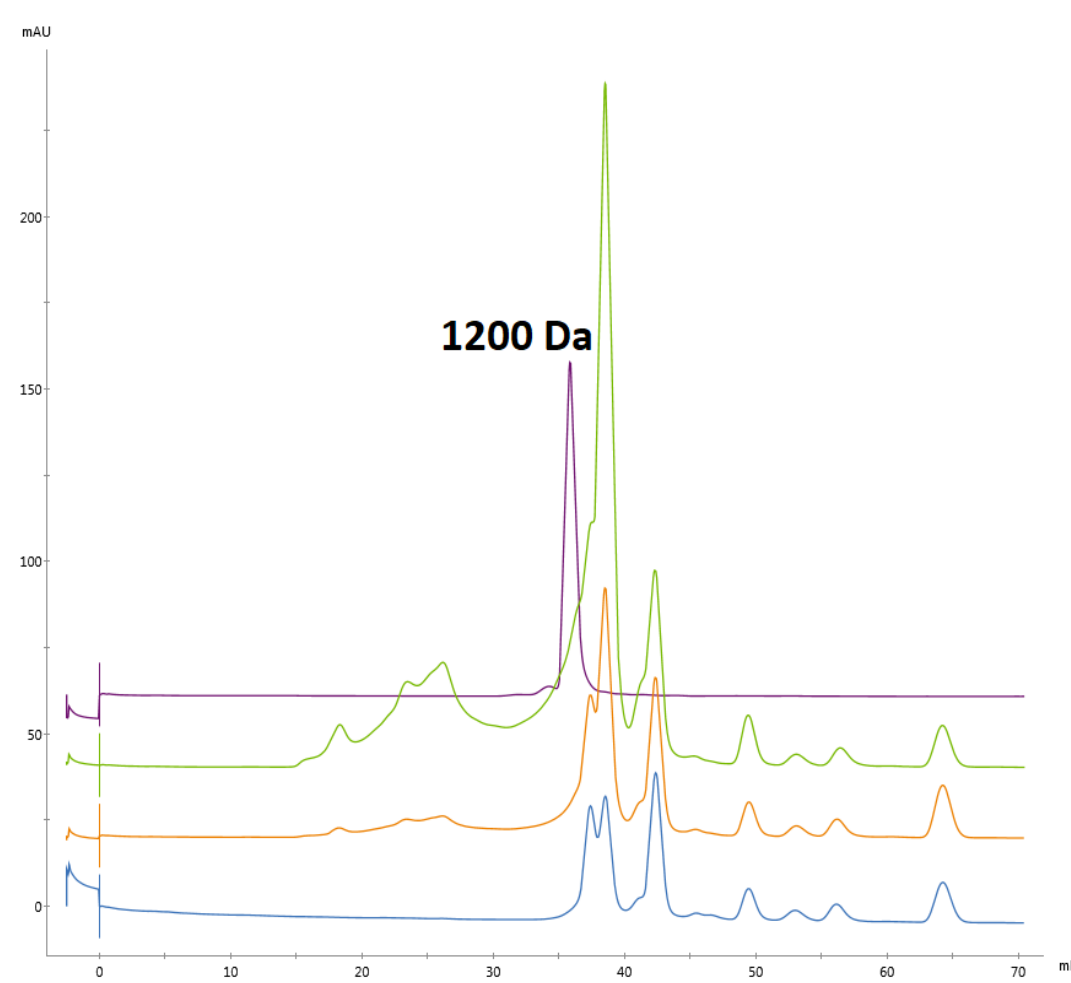
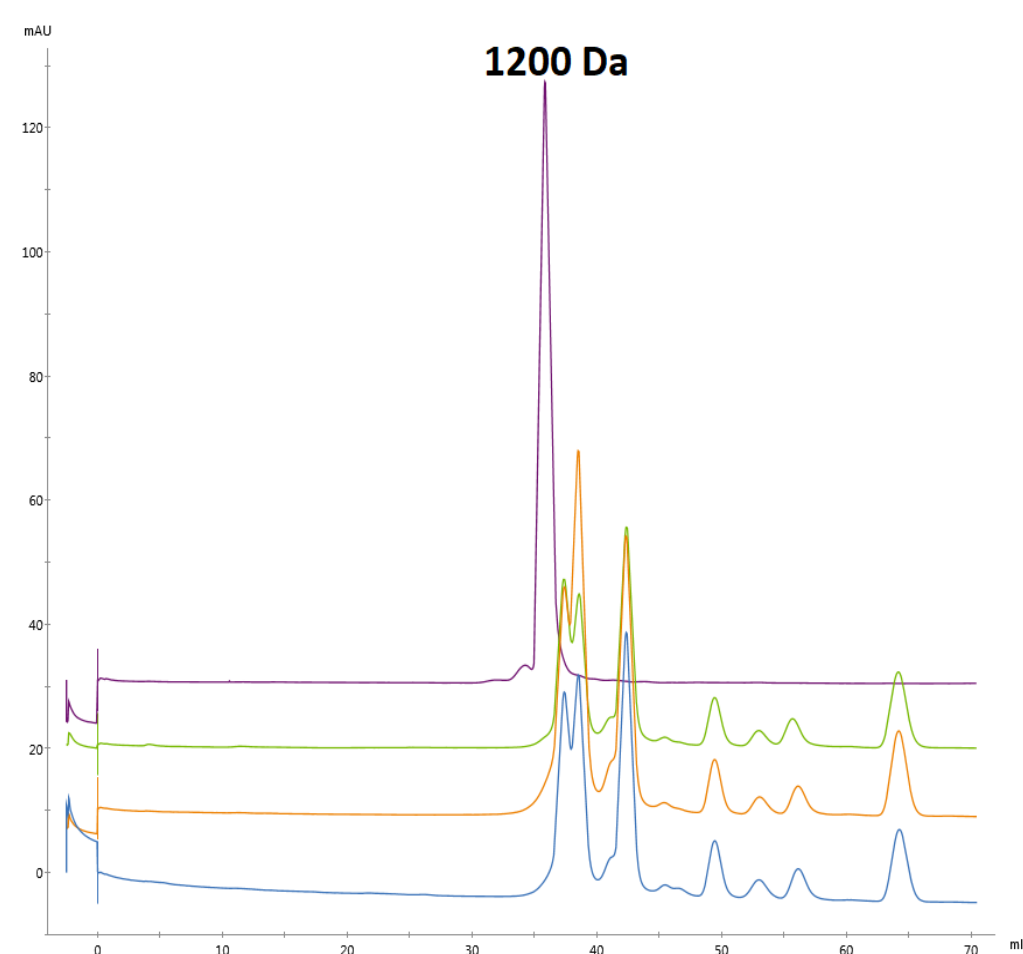


Fig10. Cooking water, NP010, (1 kDa)



Conclusions

Dead-end membrane processing of cod blood and sardine cooking wastewater was performed in batch mode, with a permeate recovery rate higher than 80, using different of membranes. Fast protein liquid chromatography (FPLC) characterization allowed to understand the membrane performance and select the most interesting fractions to be targeted for functional properties aiming at their great potentials for nutraceutical, medical, and food applications.

References

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