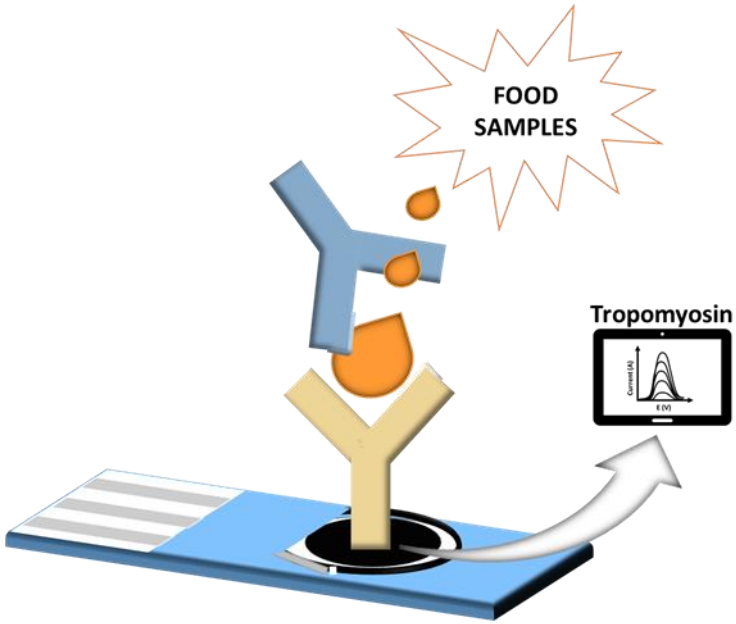
1ST INTERNATIONAL ELECTRONIC CONFERENCE ON CHEMICAL SENSORS AND ANALYTICAL CHEMISTRY

01-15 JULY 2021 | ONLINE



TROPOMYOSIN ANALYSIS IN FOODS USING AN ELECTROCHEMICAL IMMUNOSENSING APPROACH

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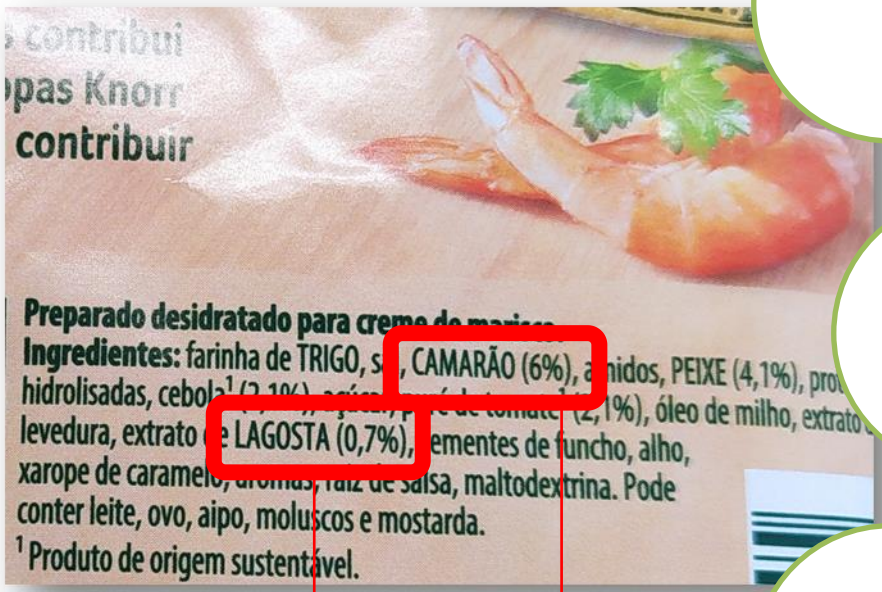


Lobster (0.7%)

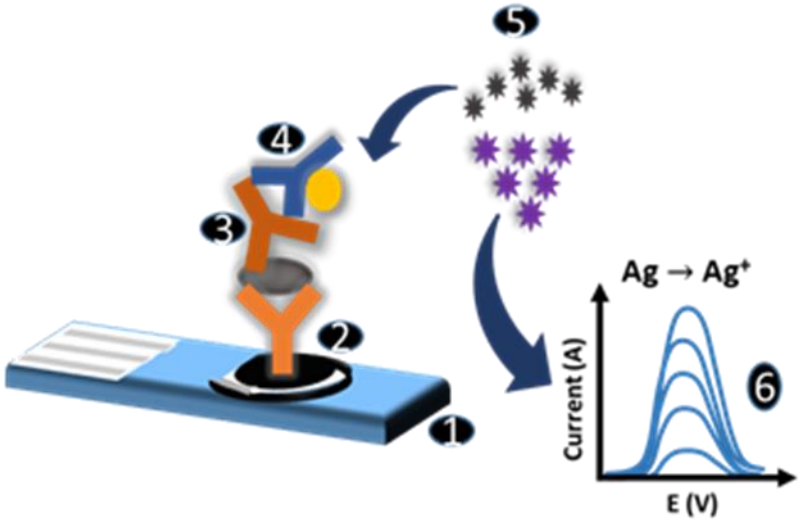
Shrimp (6%)

Tropomyosin is a common allergenic protein found in seafood.

Shrimp is the predominant crustacean responsible for over 80 % of allergic reactions.

Tropomyosin detection through electrochemical immunosensors provides highly selective, sensitive, fast and cheap analysis and are suitable for *in situ* applications.

Immunosensor



Step	Designation
1	Screen-printed carbon electrode
2	capture antibody immobilization
3	mixture of antigen (standard/sample) with the detection antibody
4	AP-Ab addition
5	substrate (3-IP) and silver ions addition
6	voltametric detection of Ag^0

Optimization studies

Variable	Studied range	Selected value
[C-Ab], µg mL^{-1}	2.5 - 20	20
[D-Ab], dilution	1:250 – 1:12 000	1:2000
[AP-Ab], dilution	1:10 000 – 1:40 000	1:40 000
AP-Ab incubation time, min	15 - 60	60

Analytical features

Linear Range	2.5 – 20 ng mL^{-1}
Correlation coefficient	0.990
Slope (m)	0.787 µA ng^{-1} mL
LOD	1.7 ng mL^{-1}
LOQ	5.7 ng mL^{-1}
V_{x0}	8.8 %

Applicability to commercial food samples

Sample	Detected value
Shrimp	80.42 ± 2.7 µg g^{-1}
Shrimp sauce	170.4 ± 1.80 ng g^{-1}
Crab paste	21.6 ± 4.13 ng g^{-1}
Chicken paste	n.d.

n.d. not detected

Final Remarks

- A simple immunosensor for tropomyosin analysis was developed;
- This immunoassay only takes 2h50 min, and it requires 40 µL of sample to perform the analysis;
- The sensor can determine tropomyosin in a concentration range between 2.5 and 20 ng mL^{-1} with a good precision (coefficient of variation of 8.8 %);
- It was successfully applied to commercial food samples. Previous values of tropomyosin will be compared with traditional ELISA methods in further studies.

Funding

This research was funded by Portuguese national funds (FCT/MCTES, Fundação para a Ciência e a Tecnologia and Ministério da Ciência, Tecnologia e Ensino Superior) through the project UIDB/50006/2020. This work also received financial support from the European Union (FEDER funds through COMPETE POCI-01-0145-FEDER-030735) and National Funds (FCT) through the project PTDC/QUI-QAN/30735/2017 - TracAllerSens - Electrochemical sensors for the detection and quantification of trace amounts of allergens in food products.R.Torre thanks FCT and ESF (European Social Fund) through POCH (Programa Operacional Capital Humano) for her PhD grant (SFRH/BD/143753/2019).