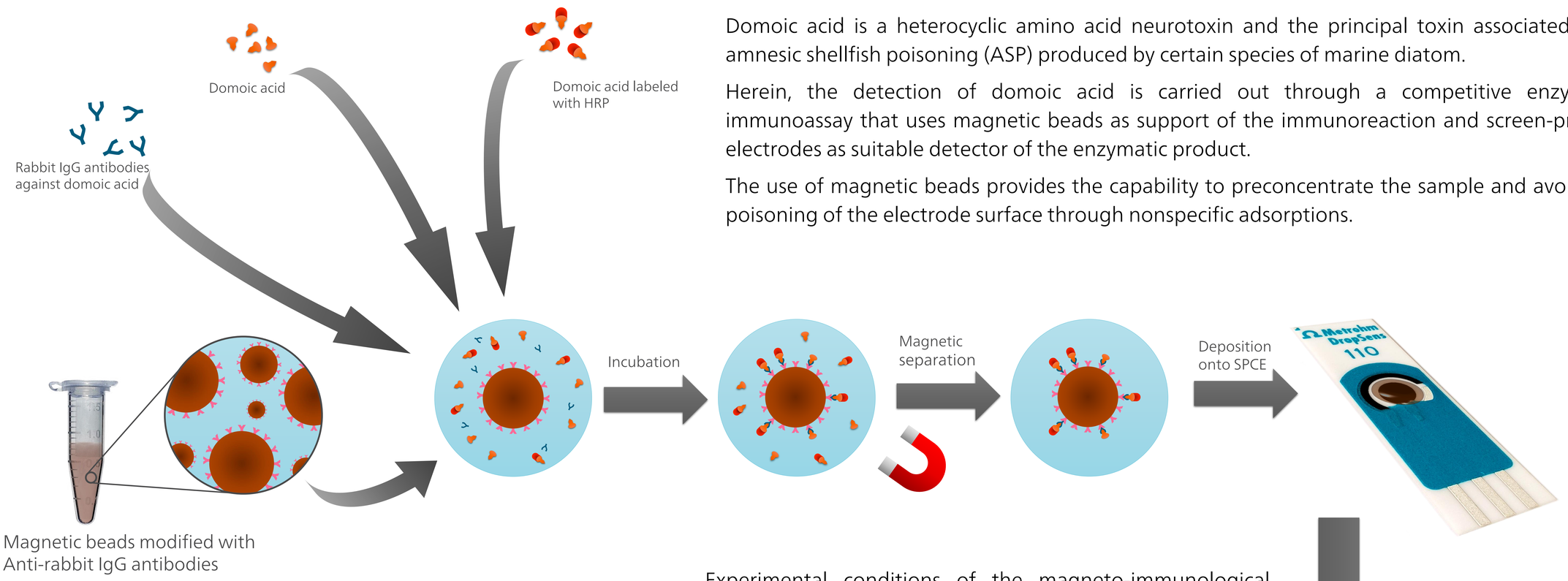
# Electrochemical Competitive Magneto-Immunoassay for Determination of Neurotoxin Domoic Acid

Pablo Fanjul-Bolado, Daniel Izquierdo Bote, María Begoña González-García, David Hernández-Santos.
*Metrohm DropSens S.L. Vivero de Ciencias de la Salud, C/ Colegio Domingo de Guzmán, s/n, 33010 Oviedo, Asturias, Spain.*
**pablo.fanjul@metrohm.com*




Domoic acid is a heterocyclic amino acid neurotoxin and the principal toxin associated with amnesic shellfish poisoning (ASP) produced by certain species of marine diatom.

Herein, the detection of domoic acid is carried out through a competitive enzymatic immunoassay that uses magnetic beads as support of the immunoreaction and screen-printed electrodes as suitable detector of the enzymatic product.

The use of magnetic beads provides the capability to preconcentrate the sample and avoid the poisoning of the electrode surface through nonspecific adsorptions.

Immunological reaction is performed in solution. Magnetic beads modified with anti-rabbit IgG antibodies, anti-domoic acid antibodies, domoic acid, the antigen, and domoic acid labeled with horseradish peroxidase (HRP) are mixed together.

During the incubation time, antigen and labeled antigen compete for the anti-domoic antibody. The generated antibody-antigen complexes are captured by the magnetic beads modified with anti-rabbit IgG.

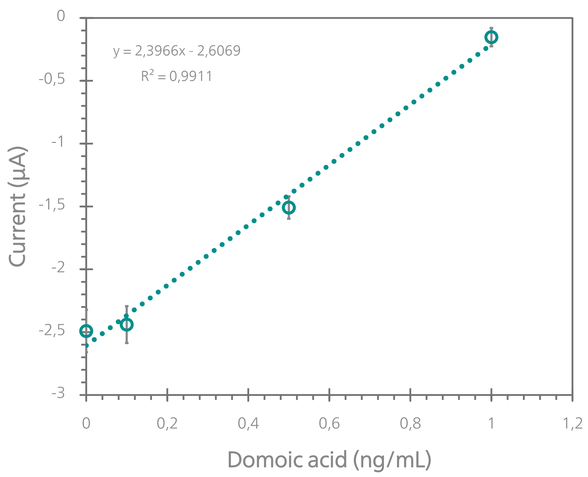
After incubation time, a magnetic separation process, with several washing steps, takes place in order to remove the species that have not reacted.

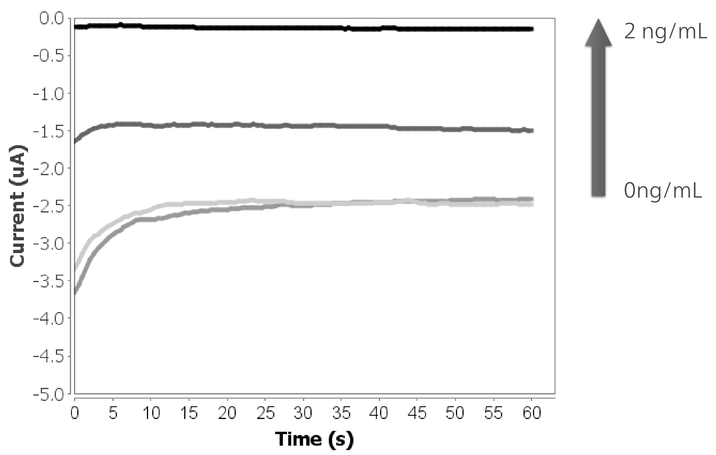
Then, the magnetic beads are deposited onto the electrode surface with the help of the magnet placed under the screen printed electrode.

Analytical signal is obtained by amperometric detection at -0,2 V of the product enzymatically generated from the mixture of $H_2O_2$ and 3,3,5,5-tetramethylbenzidine (TMB).

Experimental conditions of the magneto-immunological assay have been optimized and a calibration curve has been obtained between 0-2 ng/mL domoic acid, being able to detect down to 100 pg/mL domoic acid

Electrochemical Detection

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