Therefore, the Applicant aims to provide a universal method that can be applied to a great number of samples for the detection and the quantification of a great number of interaction probe/targets in each sample using the SIMS technique.

SUMMARY OF THE INVENTION

An aspect of t~~T~~he present invention relates to a method for detecting and quantifying at least one type of target molecules by quantifying molecules-molecules interactions, comprising:

(a) grafting unlabelled molecules on one or more array(s),

(b) labelling with ~~one or more~~different exogenous element(s) one or more type(s) of ~~circulating~~ molecules that are free in one or more solution(s), wherein each of said different exogenous elements is an element, which is not naturally contained in said free molecules and which is not naturally contained in said grafted molecules, and wherein each of said different exogenous elements is selected from the group of elements consisting of I, Br, F, S, Au, Fe, Se, As, P, B, Cu, Ag, Zn and Ni;

(c) placing said~~putting~~ solution(s) ~~containing circulating molecules~~ into contact with one or more array(s) obtained from step (a), before or after the labelling step (b), under conditions that allow the unlabelled grafted molecules present on the array(s) to interact with the ~~circulating~~ molecules of said~~from the~~ solution(s),

(d) washing and drying the array,

(e) ~~possibly~~ locating the so-obtained spots

(f) detecting and counting by Dynamic Secondary Ion Mass Spectrometry (D-SIMS) said different exogenous element~~(s) of each labelling~~ or a group of elements containing said different exogenous element~~(s)~~, ~~of each labelling and possibly a reference natural element present on the spot for each spot of each array~~

(g) calculating the ratio(s) between spots of the values of the counting by D-SIMS of each exogenous elements~~labelling~~ and/or calculating the ratio(s) ~~for each spot~~ between the value of the counting by D-SIMS of each exogenous elements~~labelling and the value of the counting by D-SIMS of a reference natural element present on the spot~~.

DETAILED DESCRIPTION OF THE INVENTION

Definitions