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(71) Applicant: INSTITUT PASTEUR [FR/FR]; 25-28 rue du
Docteur Roux, F-75015 Paris (FR).

(72) Inventors: MANUGUERRA, Jean-Claude; 16 - 18 place
de la Chapelle, F-75018 Paris (FR). VANHOMWEGEN,
Jessica; 244 rue de Charenton, F-75012 Paris (FR). DE-
SPRES, Philippe; 18 place de la liberté, F-92250 La Gar-
enne-Colombes (FR). PAULOUS, Sylvie; 10 chemin des
lavandières, F-95200 Sarcelles (FR).

(74) Agent: REGIMBEAU; 20 rue de Chazelles, F-75847 Par-
is Cedex 17 (FR).

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(54) Title: MULTIPLEX IMMUNO SCREENING ASSAY

(57) Abstract: The present invention provides kits and assay methods for the early detection of pathogens, precise identification of the etiologic agent, and improved disease surveillance. More specifically, the present invention discloses an immunoassay leading to the rapid and simultaneous detection of antibodies to a wide range of infectious pathogens in biological fluids of infected patients. This immunoassay involves the covalent and oriented coupling of fusion proteins comprising an AGT enzyme and a viral antigen on an identifiable solid support (e.g. fluorescent microspheres), said support being previously coated with an AGT substrate. This coupling is mediated by the irreversible reaction of the AGT enzyme on its substrate. The thus obtained antigen-coupled microspheres show enhanced capture of specific antibodies as compared to antigen-coupled microspheres produced by standard amine coupling procedures. The methods of the invention possess the ability to multiplex, minimize the amount of biological sample, and have enhanced sensitivity and specificity toward target antibodies as compared with classical ELISA or Radio-Immunoprecipitation assays.

