CLAIMS

[Claim 1]

A method for producing a reagent for detection of antibody binding to an antigenic protein;~~antibody detection~~ comprising ~~an~~ cationized antigenic protein and ~~a~~ ~~carrier~~beads;~~,~~

the method comprising the steps of:

solubilizing the antigenic protein by cationization wherein the cationization is performed by the binding of a cationizing agent to thiol groups of the antigenic protein; and

allowing the resultant cationized antigenic protein to bind to the ~~carrier~~beads.

[Claim 2]

The method ~~for producing a reagent for antibody detection~~ according to claim 1, wherein the antigenic protein is a full-length protein.

[Claim 3]

The method ~~for producing a reagent for antibody detection~~ according to claim 1 or 2, wherein the antigenic protein is a membrane protein.

[Claim 4]

The method ~~for producing a reagent for antibody detection~~ according to any one of claims 1 to 3, wherein the antigenic protein is a cancer antigenic protein.

~~[Claim 5]~~

~~The method for producing a reagent for antibody detection according to any one of claims 1 to 4, wherein the cationization is performed by the binding of a cationizing agent to thiol groups of the antigenic protein.~~

~~[Claim 6]~~

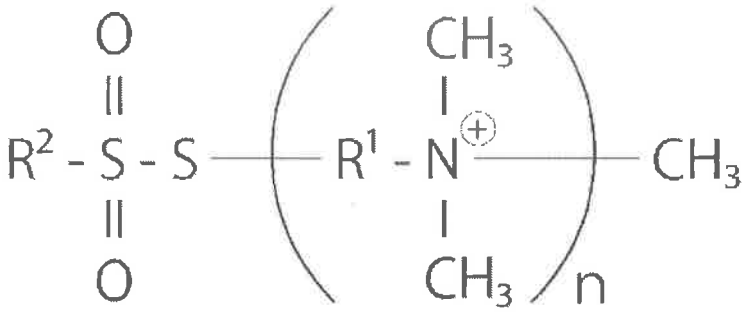
~~The method for producing a reagent for antibody detection according to claim 5, wherein the cationizing agent is selected from any one of a thiosulfonate compound, a mixed disulfide compound, a pyridyl sulfide cationizing agent, and an alkyl halide cationizing agent, and mixtures thereof.~~

[Claim ~~7~~5]

The method ~~for producing a reagent for antibody detection~~ according to claim ~~6~~1, wherein the cationizing agent~~thiosulfonate compound~~ is a compound represented by

the following formula:

[Formula 1]



wherein R^1 represents a linear alkylene group having 2 to 20 carbon atoms; R^2 represents an alkyl group having 1 to 3 carbon atoms; and n represents any integer of 1 to 3.

[Claim ~~8~~6]

The method according to claim ~~7~~5, wherein the compound is TAPS-sulfonate wherein R^1 is $-(CH_2)_3-$; R^2 is CH_3-; and n is 1.

[Claim ~~9~~7]

The method ~~for producing a reagent for antibody detection~~ according to claim ~~7~~5, wherein the compound is TAP3S-sulfonate wherein R^1 is $-(CH_2)_3-$; R^2 is CH_3-; and n is 3.

[Claim ~~10~~8]

The method ~~for producing a reagent for antibody detection~~ according to claim ~~6~~1, wherein the cationizing agent~~alkyl halide cationizing agent~~ is TAP-Br.

[Claim ~~11~~9]

The method ~~for producing a reagent for antibody detection~~ according to any one of claims 1 to ~~10~~8, wherein the beads~~carrier~~ are~~is~~ magnetic beads.

[Claim ~~12~~10]

A reagent ~~for antibody detection~~ produced by a method according to any one of claims 1 to ~~11~~9.

[Claim ~~13~~11]

A method for detecting an antigen-specific antibody contained in a sample, the method comprising the steps of: contacting a reagent ~~for antibody detection~~ according to claim ~~12~~ 10 with the sample; adding thereto an antibody-binding labeled secondary antibody to allow the secondary antibody to bind to the antibody; recovering the reagent for antibody detection; and detecting the reagent for antibody detection bound with the antibody.

[Claim ~~14~~12]

The method according to claim ~~13~~11, wherein the sample is an isolated body fluid.