[CLAIMS]

[Claim 1]

A method for detecting an interaction between a first protein and a second protein, the method comprising the steps of:

expressing in a cell a first fusion protein comprising the first protein and an association-inducing protein, and a second fusion protein comprising the second protein and a fluorescent protein capable of forming a homomultimer~~having a multimerization ability~~;

detecting a fluorescent focus formed by an association between the first fusion protein and the second fusion protein in the cell; and

determining an interaction between the first protein and the second protein according to the detection of the fluorescent focus,

wherein the association-inducing protein is at least one protein selected from the group consisting of a PB1 domain of p62, a PB1 domain of TFG, a PB1 domain of PKCiota, a SAM domain of TEL, a SAM domain of DGK delta, and a SAM domain of Tankyrase-1.

[Claim 2]

The method according to claim 1, wherein the fluorescent focus is detected to detect the interaction taking place or ending, a period until the interaction takes place or ends, or a duration of the interaction.

[Claim 3]

The method according to claim 1, wherein the fluorescent focus is detected to detect the interaction taking place or ending in response to a particular stimulus, a period until the interaction takes place or ends, or a duration of the interaction.

[Claim 4]

The method according to any one of claims 1 to 3 for screening for a protein interacting with a particular protein, wherein

one of the first protein and the second protein is the particular protein, while the other is a test protein, and

a protein interacting with the particular protein is selected according to the detection of the fluorescent focus.

[Claim 5]

The method according to any one of claims 1 to 3 for identifying any one of an amino acid residue in the first protein and an amino acid residue in the second protein, which are involved in the interaction, wherein

in a case where a protein in which a mutation is introduced is used as any one of the first protein and the second protein, if an intensity of the fluorescent focus is reduced in comparison with a case of using a protein in which no mutation is introduced, the amino acid residue

in which the mutation is introduced is determined to be involved in the interaction.

[Claim 6]

A method for screening for a substance modulating an interaction between a first protein and a second protein, the method comprising the steps of:

expressing in a cell a first fusion protein comprising the first protein and an association-inducing protein, and a second fusion protein comprising the second protein and a fluorescent protein capable of forming a homomultimer~~having a multimerization ability~~, in presence of a test compound;

detecting a fluorescent focus formed by an association between the first fusion protein and the second fusion protein in the cell; and

selecting the test compound as a substance inducing the interaction if a fluorescence intensity of the fluorescent focus is higher than a fluorescence intensity of a fluorescent focus formed in absence of the test compound, or selecting the test compound as a substance suppressing the interaction if the fluorescence intensity of the fluorescent focus is lower than the fluorescence intensity of the fluorescent focus formed in the absence of the test compound,

wherein the association-inducing protein is at least one protein selected from the group consisting of a PB1

domain of p62, a PB1 domain of TFG, a PB1 domain of PKCiota, a SAM domain of TEL, a SAM domain of DGK delta, and a SAM domain of Tankyrase-1.

~~[Claim 7]~~

~~The method according to any one of claims 1 to 6, wherein the association-inducing protein is at least one protein selected from the group consisting of a PB1 domain of p62, a PB1 domain of TFG, a PB1 domain of PKCiota, a SAM domain of TEL, a SAM domain of DGK delta, and a SAM domain of Tankyrase-1.~~

[Claim ~~8~~7]

A method for screening for an association-inducing protein, the method comprising the steps of:

(a) expressing in a cell a fusion protein comprising a test protein and mAG1;

(b) expressing in a cell a fusion protein comprising the test protein and a fluorescent protein capable of forming a homomultimer~~having a multimerization ability~~; and

(c) selecting the test protein as an association-inducing protein if a fluorescent focus is not detected in step (a) but a fluorescent focus is detected in step (b).

[Claim ~~9~~8]

The method according to any one of claims 1 to ~~8~~7, wherein the fluorescent protein capable of forming a

homomultimer~~having a multimerization ability~~ is at least one fluorescent protein selected from the group consisting of ~~monomeric Kusabira-Orange 2,~~ Azami-Green, Kusabira-Orange 1, dimeric Keima-Red, Kikume Green-Red, ~~monomeric Keima-Red, monomeric Midoriishi-Cyan1, monomeric Kusabira-Orange 1, monomeric Kikume Green-Red1,~~ Midoriishi-Cyan1, Kusabira-Cyan1, dimeric Azami-Green (AB), dimeric Azami-Green (AC), TGuv, Momiji, COR3.01, COR5, and DsRed2.

[Claim ~~10~~9]

A kit for use in the method according to any one of claims 1 to ~~9~~8, the kit comprising an instruction and at least one substance selected from the group consisting of the following (a) to (j):

(a) a vector comprising a DNA encoding the association-inducing protein and a cloning site allowing an insertion of a DNA encoding a certain protein in such a manner that the certain protein is fused to the association-inducing protein when expressed;

(b) a vector comprising a DNA encoding the fluorescent protein capable of forming a homomultimer~~having a multimerization ability~~ and a cloning site allowing an insertion of a DNA encoding a certain protein in such a manner that the certain protein is fused to the fluorescent protein when expressed;

(c) a vector comprising a DNA encoding mAG1 and a

cloning site allowing an insertion of a DNA encoding a certain protein in such a manner that the certain protein is fused to the fluorescent protein when expressed;

(d) a vector encoding the first fusion protein;

(e) a vector encoding the second fusion protein;

(f) a vector set comprising the vector according to any one of (a) and (d) and the vector according to any one of (b) and (e);

(g) a vector set comprising the vector according to (b) and the vector according to (c);

(h) a transformed cell comprising a vector encoding the first fusion protein;

(i) a transformed cell comprising a vector encoding the second fusion protein; and

(j) a transformed cell comprising a vector encoding the first fusion protein and a vector encoding the second fusion protein,

wherein the association-inducing protein is at least one protein selected from the group consisting of a PB1 domain of p62, a PB1 domain of TFG, a PB1 domain of PKCiota, a SAM domain of TEL, a SAM domain of DGK delta, and a SAM domain of Tankyrase-1.