[CLAIMS]

[Claim 1]

A method for producing a sulfated polysaccharide, the method comprising the following steps (1-1) and (1-2):

(1-1) preparing a transformant (a) of a bacterium of the genus *Corynebacterium*, comprising at least a gene encoding an adenosine 5'-triphosphate (ATP) sulfurylase and a gene encoding an adenosine 5'-phosphosulfate (APS) kinase which are introduced thereinto in an expressible manner, or a treated matter of the transformant (a), wherein the treated matter of transformant (a) is a matter in which the cell plasma membrane of transformant (a) is substance permeable, and wherein transformant (a) or the treated matter of transformant (a) is capable of producing PAPS; and

(1-2) conducting a reaction for producing 3'-phosphoadenosine 5'-phosphosulfate (PAPS) by using a reaction solution containing ATP or an ATP source, a sulfate ion source, and transformant (a) or the treated matter of transformant (a),

wherein the method further comprises conducting sulfation by a transformant comprising a gene encoding sulfotransferase, which is introduced thereinto in an expressible manner, or a treated matter or extract of the transformant, wherein the treated matter of the transformant is a matter in which the cell plasma membrane of the transformant is substance permeable, and wherein the extract of the transformant is a crude enzyme extract, a purified enzyme, a concentrate of a culture, or a dried product of a culture, and wherein the transformant, the treated matter of the transformant, or the extract of the transformant is capable of effecting sulfation.

[Claim 2]

The method for producing a sulfated polysaccharide according to claim 1, the method further comprising the following steps (2-1) and (2-2):

(2-1) preparing a transformant (b) of a microorganism belonging to prokaryotes, comprising at least a gene encoding a C5-epimerase which is introduced thereinto in an expressible manner, or a treated matter of transformant (b), or an extract of transformant (b), wherein the treated matter of transformant (b) is a matter in which the cell plasma membrane of transformant (b) is substance permeable, wherein the extract of transformant (b) is a crude enzyme extract, a purified enzyme, a concentrate

of a culture, or a dried product of a culture, and wherein transformant (b), the treated matter of transformant (b), or the extract of transformant (b) is capable of effecting C5-epimerization; and

(2-2) conducting C5-epimerization by incorporating transformant (b), the treated matter of transformant (b), or the extract of transformant (b) in the reaction solution in the presence of N-sulfoheparosan.

[Claim 3]

The method for producing a sulfated polysaccharide according to claim 1 or 2, wherein the sulfotransferase is a 2-O-sulfotransferase.

[Claim 4]

The method for producing a sulfated polysaccharide according to claim 1 or 2 , wherein the sulfotransferase is a 6-O-sulfotransferase.

[Claim 5]

The method for producing a sulfated polysaccharide according to claim 1 or 2, wherein the sulfotransferase is a 3-O-sulfotransferase.

[Claim 6]

The method for producing a sulfated polysaccharide according to any one of claims 1 to 5, which is for producing heparin.

[Claim 7]

A method for producing 3’-phosphoadenosine 5’-phosphosulfate (PAPS), the method comprising the following steps (i) and (ii):

(i) preparing a transformant of a bacterium of the genus *Corynebacterium*, comprising at least a gene encoding an adenosine 5’-triphosphate (ATP) sulfurylase and a gene encoding an adenosine 5’-phosphosulfate (APS) kinase which are introduced thereinto in an expressible manner, or a treated matter of the transformant, wherein the treated matter of the transformant is a matter in which the cell plasma membrane of the transformant is substance permeable, and wherein the transformant or the treated matter of the transformant is capable of producing PAPS; and

(ii) conducting a reaction for producing PAPS by using a reaction solution containing

ATP or an ATP source, a sulfate ion source, and the transformant prepared in the step (i) or the treated matter of the transformant.