CLAIMS

1.Use of a compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof in the manufacture of a pharmaceutical composition for cancer treatment to be administered to a patient expressing a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide or carrying a polynucleotide encoding the fusion polypeptide,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide.

2.The use of claim 1, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

3.The use claim 1 or 2, wherein the BAIAP2L1 polypeptide:

i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

4.The use of any one of claims 1 to 3, wherein the compound or a pharmaceutically acceptable salt thereof is capable of inhibiting a growth of a cancer cell expressing the fusion polypeptide or having a nucleotide encoding the fusion polypeptide.

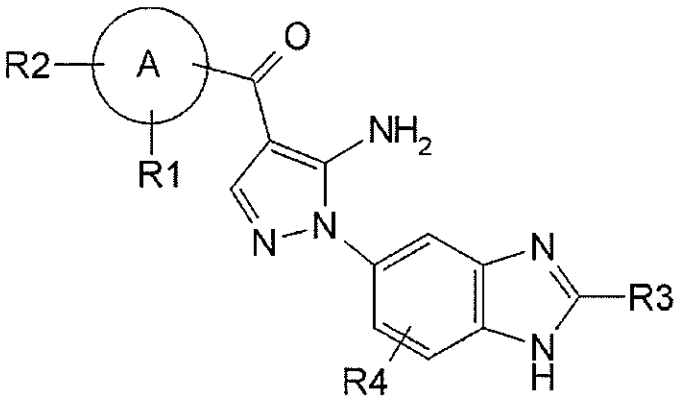
5.The use of any one of claims 1 to 4, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

6.The use of any one of claims 1 to 5, wherein the cancer is bladder cancer.

7.The use of claim 6, wherein the bladder cancer is classified as stage 3 or later according to TNM classification.

8.The use of any one of claims 1 to 7, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is any one of the compounds or a pharmaceutically acceptable salt thereof represented by:

[Compound 1]




( I )

wherein $R_1$, $R_2$, $R_3$, and $R_4$ each independently represents the group listed below:

$R_1$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

$R_2$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$; or

$R_1$ and $R_2$, together with an atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl, wherein the heterocyclyl or heteroaryl is optionally substituted by halogen;

$R_3$ represents hydrogen, $C_{1-5}$ alkyl, $C_{6-10}$ aryl $C_{1-6}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_4$ represents hydrogen, halogen, $C_{1-3}$ alkyl, $C_{1-4}$ haloalkyl, hydroxy, cyano, nitro, $C_{1-4}$ alkoxy, $-(CH_2)_nZ_1$, $-NR_6R_7$, $-OR_5$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $NR_{17}SO_2R_{18}$, COOH, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

A represents a 5- to 10-membered heteroaryl ring or $C_{6-10}$ aryl ring;

$R_5$ represents $C_{1-5}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-3}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$

haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkoxy $C_{1-4}$ alkyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, $C_{6-10}$ aryl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, or 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl, 5- to 10-membered heteroaryl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, or $C_{1-6}$ trihydroxy alkyl which is optionally substituted by one or more groups independently selected from group Q;

$R_6$ and $R_7$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, or cyano($C_{1-3}$ alkyl); or alternatively $R_6$ and $R_7$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

n represents 1 to 3;

$R_8$ and $R_9$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, or halogen; or alternatively $R_8$ and $R_9$, together with a carbon atom linked thereto, form a cycloaliphatic ring;

$Z_1$ represents hydrogen, $NR_{10}R_{11}$, -OH, or 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{10}$ and $R_{11}$, which can be the same or different, each represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, cyano($C_{1-3}$ alkyl), or $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl; or alternatively $R_{10}$ and $R_{11}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{12}$ and $R_{13}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, 3- to 10-membered cycloaliphatic ring, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl; or alternatively $R_{12}$ and $R_{13}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{14}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{15}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to

10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{16}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{17}$ represents hydrogen or $C_{1-4}$ alkyl;

$R_{18}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{19}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{20}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{21}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{22}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{23}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{24}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{25}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{26}$ and $R_{27}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{26}$ and $R_{27}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{28}$ and $R_{29}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{28}$ and $R_{29}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{30}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{31}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{32}$ represents $C_{1-4}$ alkyl or $C_{6-10}$ aryl;

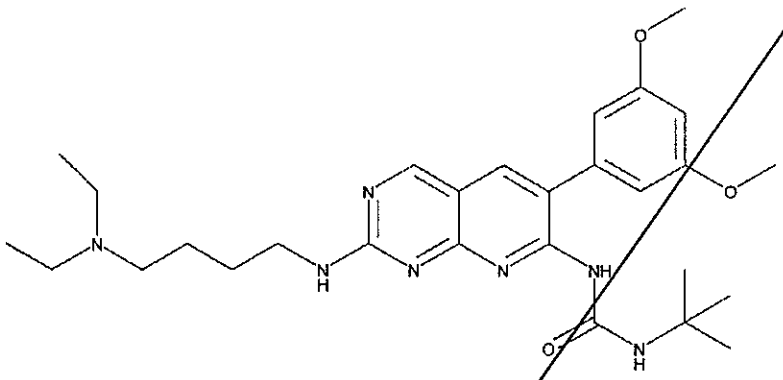
<group P>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-3}$ haloalkoxy, 3- to 10-membered heterocyclylamino, $-SO_2R_{16}$, -CN, $-NO_2$, and 3- to 10-membered heterocyclyl;

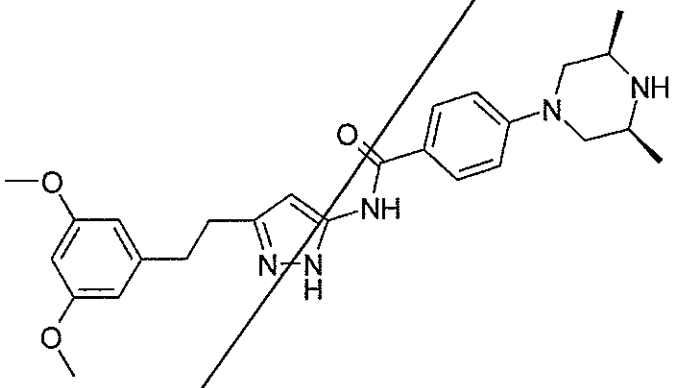
<group Q>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl amine, $-SO_2R_{16}$, -CN, $-NO_2$, $C_{3-7}$ cycloalkyl, $-COR_{19}$, and 3- to 10-membered heterocyclyl which is optionally substituted by $C_{1-4}$ alkyl.

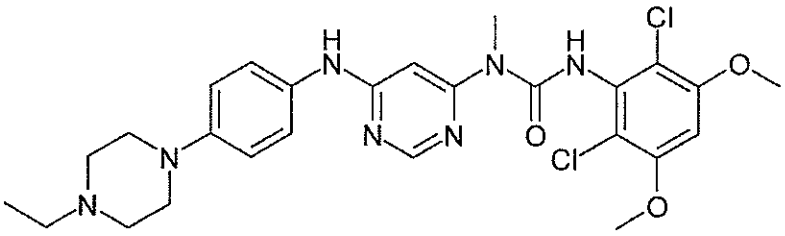
[Compound 2]



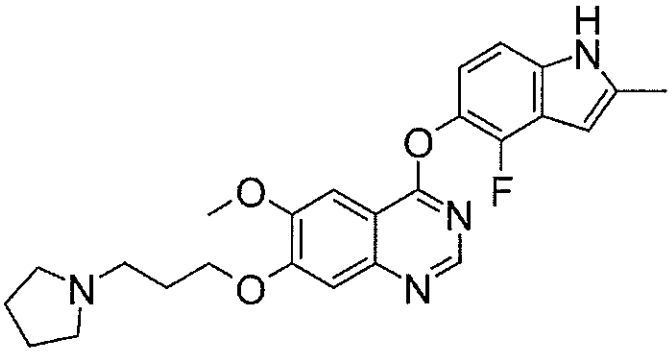
[Compound 3]



[Compound 4]

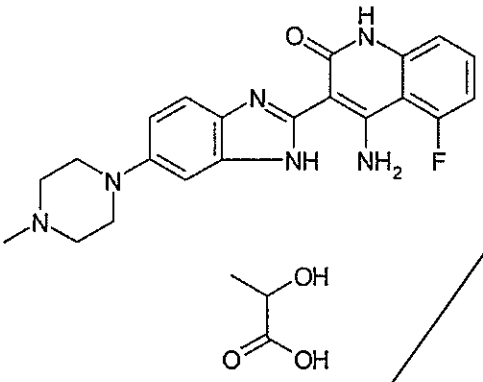


[Compound 5]



, or

[Compound 6]



9.The use of claim 8, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is a compound of formula (I), wherein A is indole, and $R_3$ and $R_4$ are both hydrogen, or a pharmaceutically acceptable salt thereof.

10. The use of any one of claims 1 to 9, wherein the fusion polypeptide consists of the amino acid sequence of SEQ ID NO: 32 or 38.

11. A method for selecting a patient to which an anticancer agent comprising a compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is applicable, which comprises the steps of:

(a) determining the presence or absence of a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from a subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

(b) selecting a patient confirmed to have the fusion polypeptide as a patient to which the anticancer agent is applicable.

12. The method of claim 11, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

13. The method of claim 11 or 12, wherein the BAIAP2L1 polypeptide:

i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

14. An *ex vivo* method for selecting a patient to which an anticancer agent comprising a compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is applicable, which comprises the steps of:

(a) determining the presence or absence of a polynucleotide encoding a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from a subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

(b) selecting a patient confirmed to have a polynucleotide encoding the fusion polypeptide

as a patient to which the anticancer agent is applicable.

15. The method of claim 14, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

16. The method of claim 14 or 15, wherein the BAIAP2L1 polypeptide:

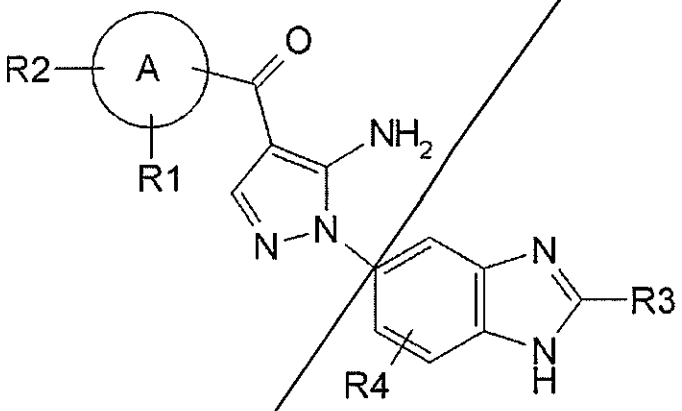
i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

17. The method of any one of claims 11 to 16, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

18. The method of any one of claims 11 to 17, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is any one of the compounds or a pharmaceutically acceptable salt thereof represented by:

[Compound 1]




( I )

wherein $R_1$, $R_2$, $R_3$, and $R_4$ each independently represents the group listed below:

$R_1$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

$R_2$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$; or

$R_1$ and $R_2$, together with an atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl, wherein the heterocyclyl or heteroaryl is optionally substituted by halogen;

$R_3$ represents hydrogen, $C_{1-5}$ alkyl, $C_{6-10}$ aryl $C_{1-6}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_4$ represents hydrogen, halogen, $C_{1-3}$ alkyl, $C_{1-4}$ haloalkyl, hydroxy, cyano, nitro, $C_{1-4}$ alkoxy, $-(CH_2)_nZ_1$, $-NR_6R_7$, $-OR_5$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $NR_{17}SO_2R_{18}$, COOH, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

A represents a 5- to 10-membered heteroaryl ring or $C_{6-10}$ aryl ring;

$R_5$ represents $C_{1-5}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-3}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkoxy $C_{1-4}$ alkyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, $C_{6-10}$ aryl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, or 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl, 5- to 10-membered heteroaryl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, or $C_{1-6}$ trihydroxy alkyl which is optionally substituted by one or more groups independently selected from group Q;

$R_6$ and $R_7$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, or cyano($C_{1-3}$ alkyl); or alternatively $R_6$ and $R_7$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

n represents 1 to 3;

$R_8$ and $R_9$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, or halogen; or alternatively $R_8$ and $R_9$, together with a carbon atom linked thereto, form a cycloaliphatic ring;

$Z_1$ represents hydrogen, $NR_{10}R_{11}$, -OH, or 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{10}$ and $R_{11}$, which can be the same or different, each represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl,

$C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, cyano($C_{1-3}$ alkyl), or $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl; or alternatively $R_{10}$ and $R_{11}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{12}$ and $R_{13}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, 3- to 10-membered cycloaliphatic ring, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl; or alternatively $R_{12}$ and $R_{13}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{14}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{15}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{16}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{17}$ represents hydrogen or $C_{1-4}$ alkyl;

$R_{18}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{19}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{20}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{21}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{22}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{23}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{24}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{25}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{26}$ and $R_{27}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{26}$ and $R_{27}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{28}$ and $R_{29}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{28}$ and $R_{29}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{30}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{31}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{32}$ represents $C_{1-4}$ alkyl or $C_{6-10}$ aryl;

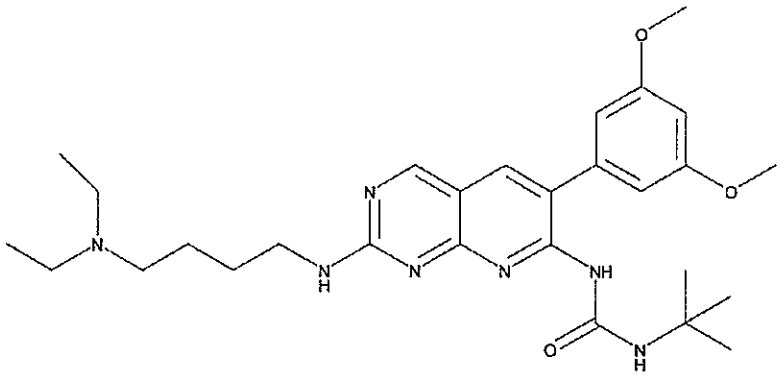
<group P>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-3}$ haloalkoxy, 3- to 10-membered heterocyclylamino, $-SO_2R_{16}$, -CN, $-NO_2$, and 3- to 10-membered heterocyclyl;

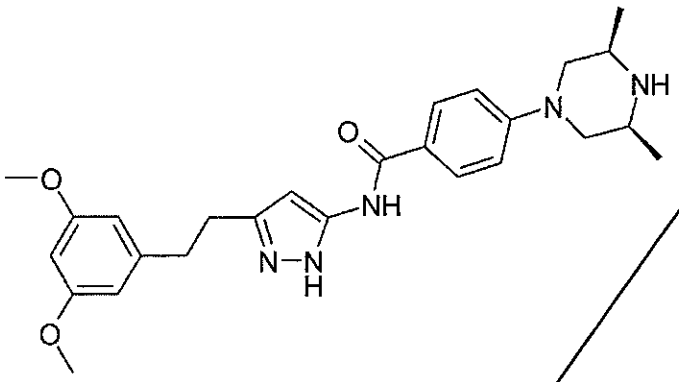
<group Q>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl amine, $-SO_2R_{16}$, -CN, $-NO_2$, $C_{3-7}$ cycloalkyl, $-COR_{19}$, and 3- to 10-membered heterocyclyl which is optionally substituted by $C_{1-4}$ alkyl.

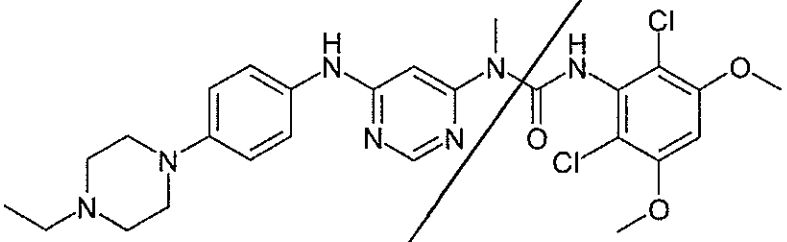
[Compound 2]



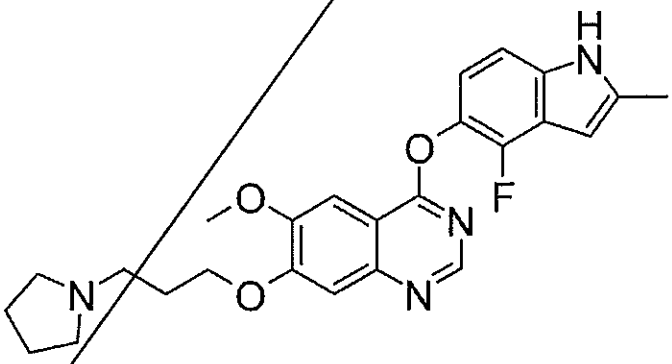
[Compound 3]



[Compound 4]

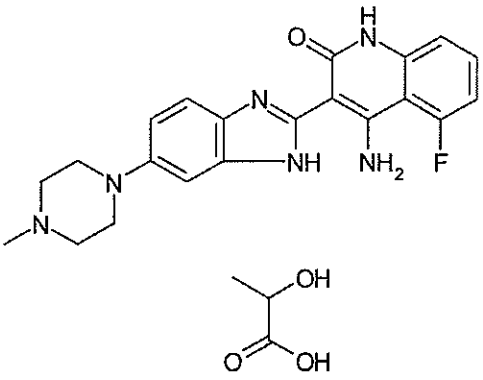


[Compound 5]



, or

[Compound 6]



19. The method of claim 18, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is a compound of formula (I), wherein A is indole, and $R_3$ and $R_4$ are both hydrogen, or a pharmaceutically acceptable salt thereof.

20. The method of any one of claims 11 to 19, wherein the fusion polypeptide consists of the amino acid sequence of SEQ ID NO: 32 or 38.

21. An *ex vivo* method for testing cancer susceptibility of a subject, whether a subject is affected with cancer, or whether cancer has progressed in a subject by determining the presence or absence of a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from the subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide;

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide;

wherein the method is based on the criterion that a subject is more likely to develop cancer, is affected with cancer, or has progressed cancer when the fusion polypeptide is detected.

22. The method of claim 21, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

23. The method of claim 21 or 22, wherein the BAIAP2L1 polypeptide:

i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

24. An *ex vivo* method for testing cancer susceptibility of a subject, whether a subject is affected with cancer, or whether cancer has progressed in a subject by determining the presence or absence of a polynucleotide encoding a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from the subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide;

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

wherein the method is based on the criterion that a subject is more likely to develop cancer, is affected with cancer, or has progressed cancer when the polynucleotide encoding the fusion polypeptide is detected.

25. The method of claim 24, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

26. The method of claim 24 or 25, wherein the BAIAP2L1 polypeptide:

i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

27. The method of any one of claims 21 to 26, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

28. The method of any one of claims 21 to 27, wherein the fusion polypeptide consists of the amino acid sequence of SEQ ID NO: 32 or 38.

29. A fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide:

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide.

30. The fusion polypeptide of claim 29, wherein the fusion polypeptide has an activity to induce autophosphorylation of an FGFR3 polypeptide, transformation of normal cells, or tumorigenesis.

31. The fusion polypeptide of claim 29 or 30, wherein the BAIAP2L1 polypeptide:

i) is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, or the whole or a part of a mutant polypeptide with one or more amino acid substitutions, deletions, or insertions in the wild-type polypeptide; and

ii) comprises a dimerization-promoting region.

32. The fusion polypeptide of claim 31, wherein the fusion polypeptide consists of the amino acid sequence of SEQ ID NO: 32 or 38.

33. The fusion polypeptide of any one of claims 29 to 32, wherein the fusion polypeptide is derived from bladder cancer or lung cancer.

34. A polynucleotide encoding the fusion polypeptide of any one of claims 29 to 33.

35. The polynucleotide of claim 34, which comprises the nucleotide sequence of SEQ ID NO: 16.

36. The polynucleotide of claim 35, which comprises the nucleotide sequence of SEQ ID NO:31 or 37.

37. A vector comprising the polynucleotide of any one of claims 34 to 36.

38. A recombinant cell comprising the vector of claim 37.

39. An antibody or antigen-binding fragment thereof which specifically binds to the fusion polypeptide of any one of claims 29 to 33.

40. A pair of oligonucleotide primers consisting of sense and antisense primers each hybridizing to a polynucleotide encoding the fusion polypeptide of any one of claims 29 to 33 for detecting or amplifying the polynucleotide.

41. An oligonucleotide that binds to an mRNA polynucleotide encoding the fusion polypeptide of any one of claims 29 to 33 and has an activity to inhibit translation of the mRNA polynucleotide into protein.

42. The oligonucleotide of claim 41, which is an siRNA that cleaves the mRNA polynucleotide.

43. A pharmaceutical composition comprising the antibody or antigen-binding fragment thereof of claim 39.

44. A pharmaceutical composition comprising the oligonucleotide of claim 41 or 42.

45. An *in vitro* method for detecting a fusion polypeptide that comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises the step of detecting the fusion polypeptide in a sample isolated from a subject by using an antibody or antigen-binding fragment thereof that binds to the fusion polypeptide of any one of claims 29 to 33.

46. An *in vitro* method for detecting a polynucleotide encoding a fusion polypeptide that comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises the step of detecting a polynucleotide encoding the fusion polypeptide in a sample isolated from a subject by using a pair of oligonucleotide primers consisting of sense and antisense primers each hybridizing to a polynucleotide encoding the fusion polypeptide of any one of claims 29 to 33 for detecting or amplifying the polynucleotide.

47. A kit for detecting a polynucleotide encoding a fusion polypeptide that

comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises a pair of oligonucleotide primers consisting of sense and antisense primers each hybridizing to a polynucleotide encoding the fusion polypeptide of any one of claims 29 to 33 for detecting or amplifying the polynucleotide.

48. A kit for detecting a fusion polypeptide that comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises an antibody or antigen-binding fragment thereof that binds to the fusion polypeptide of any one of claims 29 to 33.

CLAIMS

1.Use of a compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof in the manufacture of a pharmaceutical composition for cancer treatment to be administered to a patient who has been identified to express a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide or carrying a polynucleotide encoding the fusion polypeptide,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7,

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, and

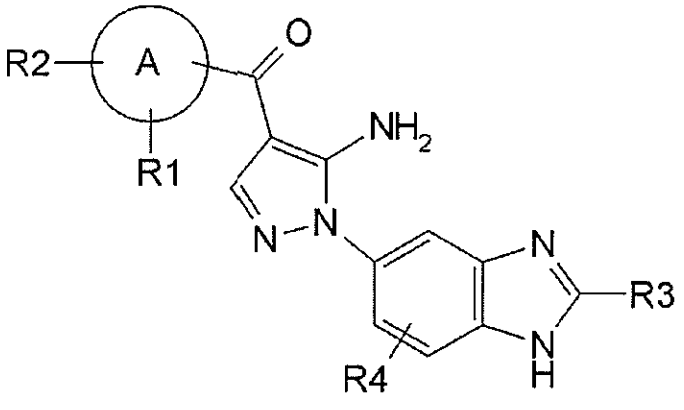
wherein the compound or pharmaceutically acceptable salt thereof is capable of inhibiting a growth of a cancer cell expressing the fusion polypeptide or having a nucleotide encoding the fusion polypeptide.

2.The use of claim 1, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

3.The use of claim 2, wherein the cancer is bladder cancer.

4.The use of any one of claims 1 to 3, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is any one of the compounds or a pharmaceutically acceptable salt thereof represented by:

[Compound.1]




( I )

wherein $R_1$, $R_2$, $R_3$, and $R_4$ each independently represents the group listed below:

$R_1$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one

or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

$R_2$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$; or

$R_1$ and $R_2$, together with an atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl, wherein the heterocyclyl or heteroaryl is optionally substituted by halogen;

$R_3$ represents hydrogen, $C_{1-5}$ alkyl, $C_{6-10}$ aryl $C_{1-6}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_4$ represents hydrogen, halogen, $C_{1-3}$ alkyl, $C_{1-4}$ haloalkyl, hydroxy, cyano, nitro, $C_{1-4}$ alkoxy, $-(CH_2)_nZ_1$, $-NR_6R_7$, $-OR_5$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $NR_{17}SO_2R_{18}$, COOH, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

A represents a 5- to 10-membered heteroaryl ring or $C_{6-10}$ aryl ring;

$R_5$ represents $C_{1-5}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-3}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkoxy $C_{1-4}$ alkyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, $C_{6-10}$ aryl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, or 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl, 5- to 10-membered heteroaryl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, or $C_{1-6}$ trihydroxy alkyl which is optionally substituted by one or more groups independently selected from group Q;

$R_6$ and $R_7$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, or cyano($C_{1-3}$ alkyl); or alternatively $R_6$ and $R_7$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

n represents 1 to 3;

$R_8$ and $R_9$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, or halogen; or alternatively $R_8$ and $R_9$, together with a carbon atom linked thereto, form a cycloaliphatic ring;

$Z_1$ represents hydrogen, $NR_{10}R_{11}$, -OH, or 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{10}$ and $R_{11}$, which can be the same or different, each represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, cyano($C_{1-3}$ alkyl), or $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl; or alternatively $R_{10}$ and $R_{11}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{12}$ and $R_{13}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, 3- to 10-membered cycloaliphatic ring, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl; or alternatively $R_{12}$ and $R_{13}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{14}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{15}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{16}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{17}$ represents hydrogen or $C_{1-4}$ alkyl;

$R_{18}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{19}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{20}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{21}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered

heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{22}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{23}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{24}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{25}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{26}$ and $R_{27}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{26}$ and $R_{27}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{28}$ and $R_{29}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{28}$ and $R_{29}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{30}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{31}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{32}$ represents $C_{1-4}$ alkyl or $C_{6-10}$ aryl;

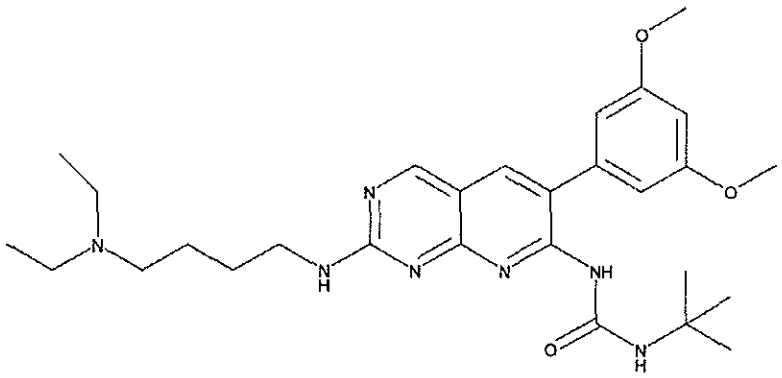
<group P>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-3}$ haloalkoxy, 3- to 10-membered heterocyclylamino, $-SO_2R_{16}$, -CN, $-NO_2$, and 3- to 10-membered heterocyclyl;

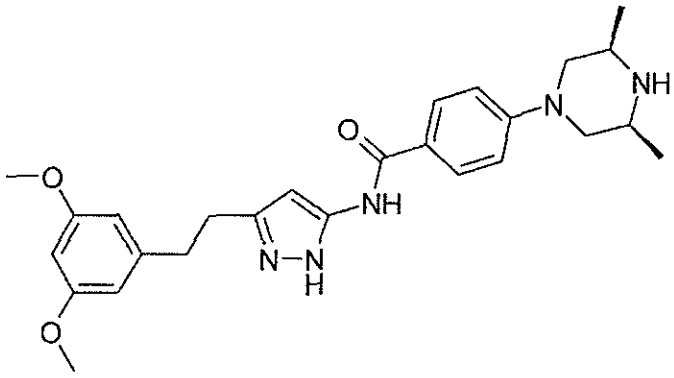
<group Q>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl amine, $-SO_2R_{16}$, -CN, $-NO_2$, $C_{3-7}$ cycloalkyl, $-COR_{19}$, and 3- to 10-membered heterocyclyl which is optionally substituted by $C_{1-4}$ alkyl.

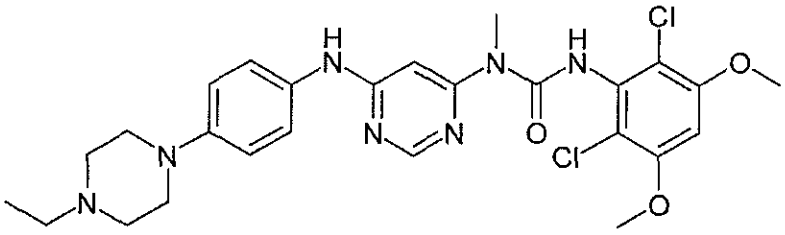
[Compound 2]



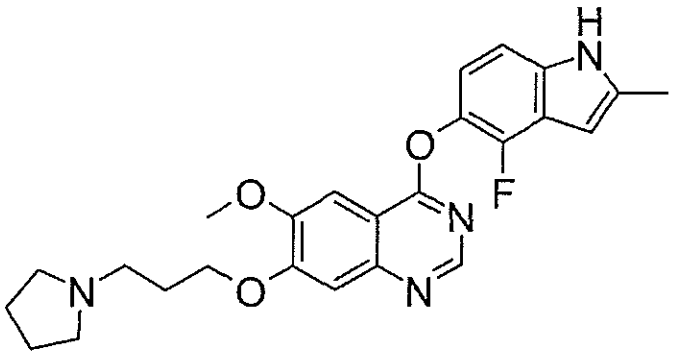
[Compound 3]



[Compound 4]

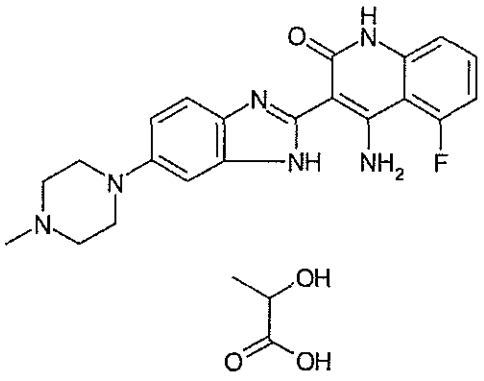


[Compound 5]



, or

[Compound 6]



5.A method for selecting a patient to which an anticancer agent comprising a compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is applicable, which comprises the steps of:

(a) determining the presence or absence of a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide or a polynucleotide encoding an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from a subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, and

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, and

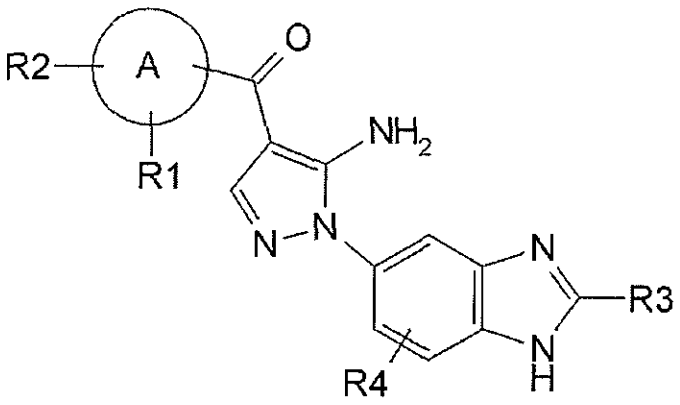
(b) selecting a patient confirmed to have the fusion polypeptide or the polynucleotide as a patient to which the anticancer agent is applicable,

wherein the compound or pharmaceutically acceptable salt thereof is capable of inhibiting a growth of a cancer cell expressing the fusion polypeptide or having a nucleotide encoding the fusion polypeptide.

6.The method of claim 5, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

7.The method of claim 5 or 6, wherein the compound having FGFR inhibitory activity or a pharmaceutically acceptable salt thereof is any one of the compounds or a pharmaceutically acceptable salt thereof represented by:

[Compound 1]



( I )

wherein $R_1$, $R_2$, $R_3$, and $R_4$ each independently represents the group listed below:

$R_1$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

$R_2$ represents hydrogen, hydroxy, halogen, cyano, nitro, $C_{1-4}$ haloalkyl, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{3-7}$ cycloalkyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, $-OR_5$, $-NR_6R_7$, $-(CR_8R_9)_nZ_1$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $-NR_{17}SO_2R_{18}$, COOH, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$; or

$R_1$ and $R_2$, together with an atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl, wherein the heterocyclyl or heteroaryl is optionally substituted by halogen;

$R_3$ represents hydrogen, $C_{1-5}$ alkyl, $C_{6-10}$ aryl $C_{1-6}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_4$ represents hydrogen, halogen, $C_{1-3}$ alkyl, $C_{1-4}$ haloalkyl, hydroxy, cyano, nitro, $C_{1-4}$ alkoxy, $-(CH_2)_nZ_1$, $-NR_6R_7$, $-OR_5$, $-C(O)NR_{12}R_{13}$, $-SR_{14}$, $-SOR_{15}$, $-SO_2R_{16}$, $NR_{17}SO_2R_{18}$, COOH, $-COR_{19}$, $-COOR_{20}$, $-OC(O)R_{21}$, $-NR_{22}C(O)R_{23}$, $-NR_{24}C(S)R_{25}$, $-C(S)NR_{26}R_{27}$, $-SO_2NR_{28}R_{29}$, $-OSO_2R_{30}$, $-SO_3R_{31}$, or $-Si(R_{32})_3$;

A represents a 5- to 10-membered heteroaryl ring or $C_{6-10}$ aryl ring;

$R_5$ represents $C_{1-5}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-3}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkoxy $C_{1-4}$ alkyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, $C_{6-10}$ aryl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, or 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl, 5- to 10-membered heteroaryl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy

alkyl, or $C_{1-6}$ trihydroxy alkyl which is optionally substituted by one or more groups independently selected from group Q;

$R_6$ and $R_7$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl $C_{1-3}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl, $C_{1-4}$ aminoalkyl, $C_{1-4}$ alkylamino $C_{1-4}$ alkyl, di($C_{1-4}$ alkyl)amino $C_{1-4}$ alkyl, or cyano($C_{1-3}$ alkyl); or alternatively $R_6$ and $R_7$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

n represents 1 to 3;

$R_8$ and $R_9$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, or halogen; or alternatively $R_8$ and $R_9$, together with a carbon atom linked thereto, form a cycloaliphatic ring;

$Z_1$ represents hydrogen, $NR_{10}R_{11}$, -OH, or 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{10}$ and $R_{11}$, which can be the same or different, each represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, cyano($C_{1-3}$ alkyl), or $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl; or alternatively $R_{10}$ and $R_{11}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{12}$ and $R_{13}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxy $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, 3- to 10-membered cycloaliphatic ring, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl; or alternatively $R_{12}$ and $R_{13}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl which is optionally substituted by one or more groups independently selected from group Q;

$R_{14}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{15}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{16}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to

10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{17}$ represents hydrogen or $C_{1-4}$ alkyl;

$R_{18}$ represents $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl which is optionally substituted by one or more groups independently selected from group P, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{19}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, or 5- to 10-membered heteroaryl or 3- to 10-membered heterocyclyl which is optionally substituted by one or more groups independently selected from group Q;

$R_{20}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{21}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{22}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{23}$ represents hydrogen, $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{24}$ represents hydrogen, $C_{1-4}$ alkyl, or $C_{1-4}$ haloalkyl;

$R_{25}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{26}$ and $R_{27}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{26}$ and $R_{27}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{28}$ and $R_{29}$, which can be the same or different, each represents hydrogen, $C_{1-4}$ alkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, $C_{1-4}$ haloalkyl, $C_{1-3}$ alkoxyl $C_{1-4}$ alkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, 3- to 10-membered heterocyclyl, $C_{6-10}$ aryl $C_{1-4}$ alkyl, 3- to 10-membered heterocyclyl $C_{1-3}$ alkyl, 5- to 10-membered heteroaryl $C_{1-3}$ alkyl, cyano($C_{1-3}$ alkyl), $C_{1-3}$ alkylsulfonyl $C_{1-4}$ alkyl, or 3- to 10-membered cycloaliphatic ring; or alternatively $R_{28}$ and $R_{29}$, together with a nitrogen atom linked thereto, form 3- to 10-membered heterocyclyl or 5- to 10-membered heteroaryl;

$R_{30}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{31}$ represents $C_{1-4}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{1-4}$ haloalkyl, $C_{6-10}$ aryl, 5- to 10-membered heteroaryl, or 3- to 10-membered heterocyclyl;

$R_{32}$ represents $C_{1-4}$ alkyl or $C_{6-10}$ aryl;

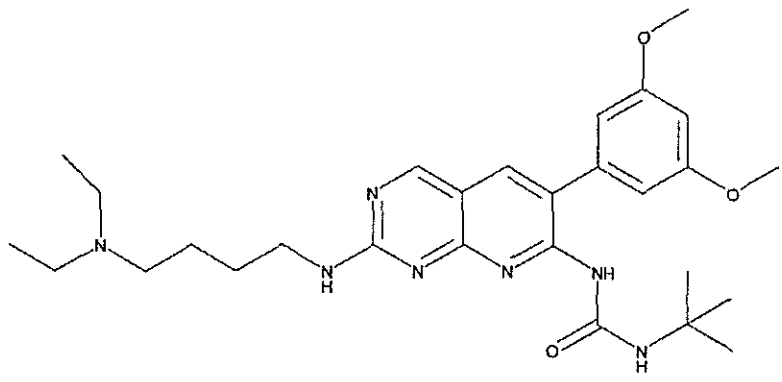
<group P>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-3}$ haloalkoxy, 3- to 10-membered heterocyclylamino, $-SO_2R_{16}$, -CN, $-NO_2$, and 3- to 10-membered heterocyclyl;

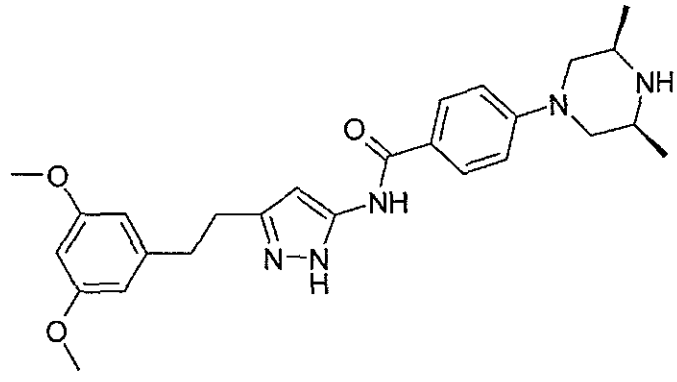
<group Q>

halogen, $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, -OH, $C_{1-3}$ alkoxy, $C_{1-6}$ monohydroxy alkyl, $C_{1-6}$ dihydroxy alkyl, $C_{1-6}$ trihydroxy alkyl, 3- to 10-membered heterocyclyl amine, $-SO_2R_{16}$, -CN, $-NO_2$, $C_{3-7}$ cycloalkyl, $-COR_{19}$, and 3- to 10-membered heterocyclyl which is optionally substituted by $C_{1-4}$ alkyl.

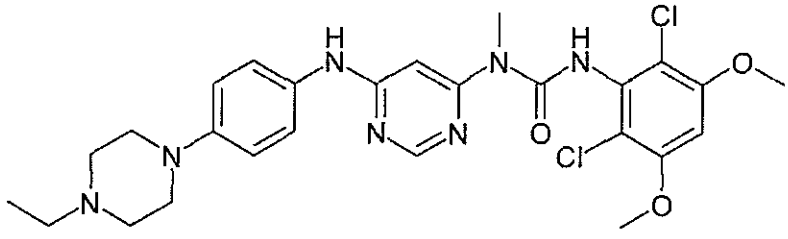
[Compound 2]



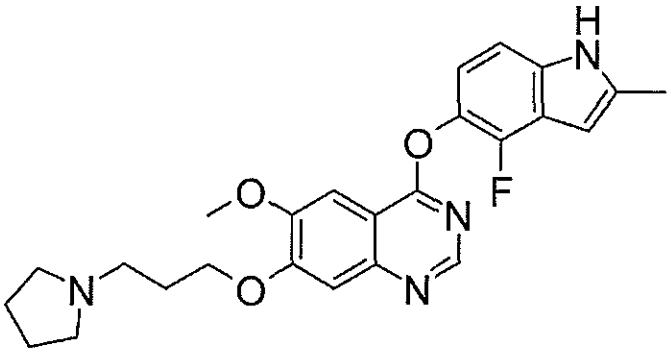
[Compound 3]



[Compound 4]

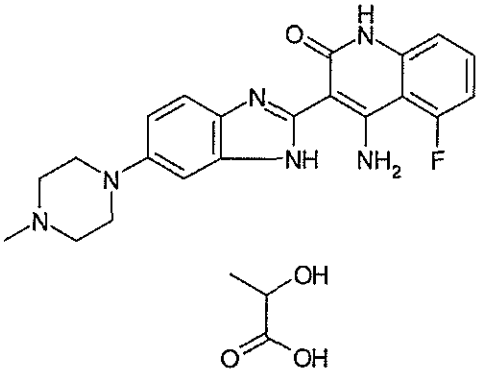


[Compound 5]



, or

[Compound 6]



8.A method for testing cancer susceptibility of a subject, whether a subject is affected with cancer or whether cancer has progressed in a subject, by determining the presence or absence of a fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide or a polynucleotide encoding an FGFR3 polypeptide and a BAIAP2L1 polypeptide in a sample isolated from the subject,

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7,

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8, and

wherein the method is based on the criterion that a subject is more likely to develop cancer, is affected with cancer, or has progressed cancer when the fusion polypeptide or polynucleotide encoding the fusion polypeptide is detected.

9.The method of claim 8, wherein the cancer is bladder cancer, brain tumor, head and neck squamous cell carcinoma, lung cancer, lung adenocarcinoma, lung squamous cell carcinoma, skin melanoma, esophageal cancer, gastric cancer, or liver cancer.

10. A fusion polypeptide comprising an FGFR3 polypeptide and a BAIAP2L1 polypeptide:

wherein the FGFR3 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 6 or 7, and

wherein the BAIAP2L1 polypeptide is the whole or a part of a wild-type polypeptide consisting of the amino acid sequence of SEQ ID NO: 8.

11. The fusion polypeptide of claim 10, wherein the fusion polypeptide consists of the amino acid sequence of SEQ ID NO: 32 or 38.

12. The fusion polypeptide of claim 10 or 11, wherein the fusion polypeptide is derived from bladder cancer or lung cancer.

13. A polynucleotide encoding the fusion polypeptide of any one of claims 10 to 12.

14. The polynucleotide of claim 13, which comprises the nucleotide sequence of SEQ ID NO: 16.

15. The polynucleotide of claim 14, which comprises the nucleotide sequence of SEQ ID NO: 31 or 37.

16. A vector comprising the polynucleotide of any one of claims 13 to 15.

17. A recombinant cell comprising the vector of claim 16.

18. A method for detecting a fusion polypeptide that comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises the step of detecting the fusion polypeptide in a sample isolated from a subject by using an antibody or antigen-binding fragment thereof that binds to the fusion polypeptide of any one of claims 10 to 12.

19. A method for detecting a polynucleotide encoding a fusion polypeptide that comprises an FGFR3 polypeptide and a BAIAP2L1 polypeptide, which comprises the step of detecting a polynucleotide encoding the fusion polypeptide in a sample isolated from a subject by using a pair of oligonucleotide primers consisting of sense and antisense primers each hybridizing to a polynucleotide encoding the fusion polypeptide of any one of claims 10 to 12 for detecting or amplifying the polynucleotide.