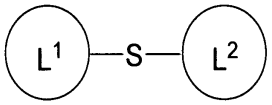
[CLAIMS]

[1] A compound represented by the following formula (I) or a pharmaceutically acceptable salt thereof:

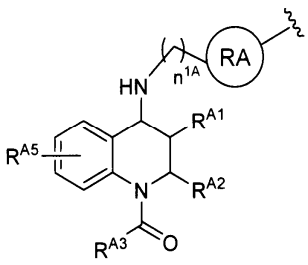
[Chemical formula 1]



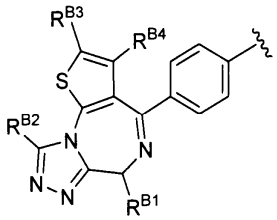
(I)

(wherein, L^1 and L^2 are the same or different and each represents a group represented by one formula selected from the group consisting of the following formulas (A) to (F), and S represents a group represented by one formula selected from the group consisting of the following formulas (S1) to (S18), provided that at least one of L^1 and L^2 is a group represented by formula (A), or that both of L^1 and L^2 is a group represented by formula (B):

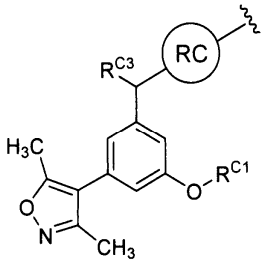
[Chemical formula 2]



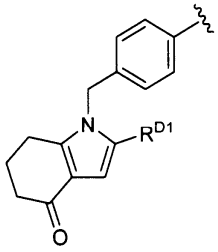
(A)



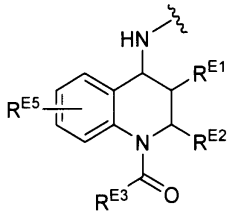
(B)



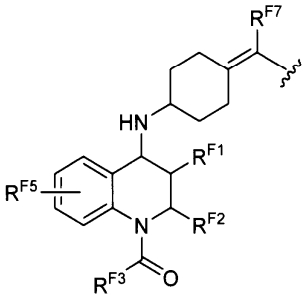
(C)



(D)



(E)



(F)

(wherein,

the wavy line represents a bonding site to S,

R^{A1}, R^{A2}, and R^{A3} are the same or different and each represents a hydrogen atom or lower alkyl,

R^{A5} represents a hydrogen atom, a halogen, optionally substituted lower alkyl, optionally substituted lower alkenyl, optionally substituted tetrahydropyridinyl, optionally substituted dihydro-1H-pyrrolyl, or optionally substituted tetrahydro-1H-azepinyl,

ring RA represents benzenediyl, cycloalkanediyl, pyridinediyl, piperidinediyl, azetidinediyl, pyrrolidinediyl, or homopiperidinediyl,

n^{1A} represents 0 or 1,

R^{B1} represents a hydrogen atom, optionally substituted lower alkoxycarbonylmethyl, optionally substituted cycloalkyloxycarbonylmethyl, or $-CH_2CONR^{B5}R^{B6}$ (wherein, R^{B5} and R^{B6} are the same or different and each represents a hydrogen atom or optionally substituted lower alkyl, or they represent an optionally substituted nitrogen-containing aliphatic heterocyclic group together with an adjacent nitrogen atom),

R^{B2} represents optionally substituted lower alkyl,

R^{B3} and R^{B4} are the same or different and each represents a halogen or optionally substituted lower alkyl,

R^{C1} represents a hydrogen atom, lower alkyl, or lower alkanoyl,

R^{C3} represents a hydrogen atom or hydroxy,

ring RC represents benzenediyl, piperidinediyl, azetidinediyl, pyrrolidinediyl, or homopiperidinediyl,

R^{D1} represents optionally substituted lower alkyl or optionally substituted lower alkoxycarbonyl,

R^{E1} and R^{F1} have the same definition as R^{A1},

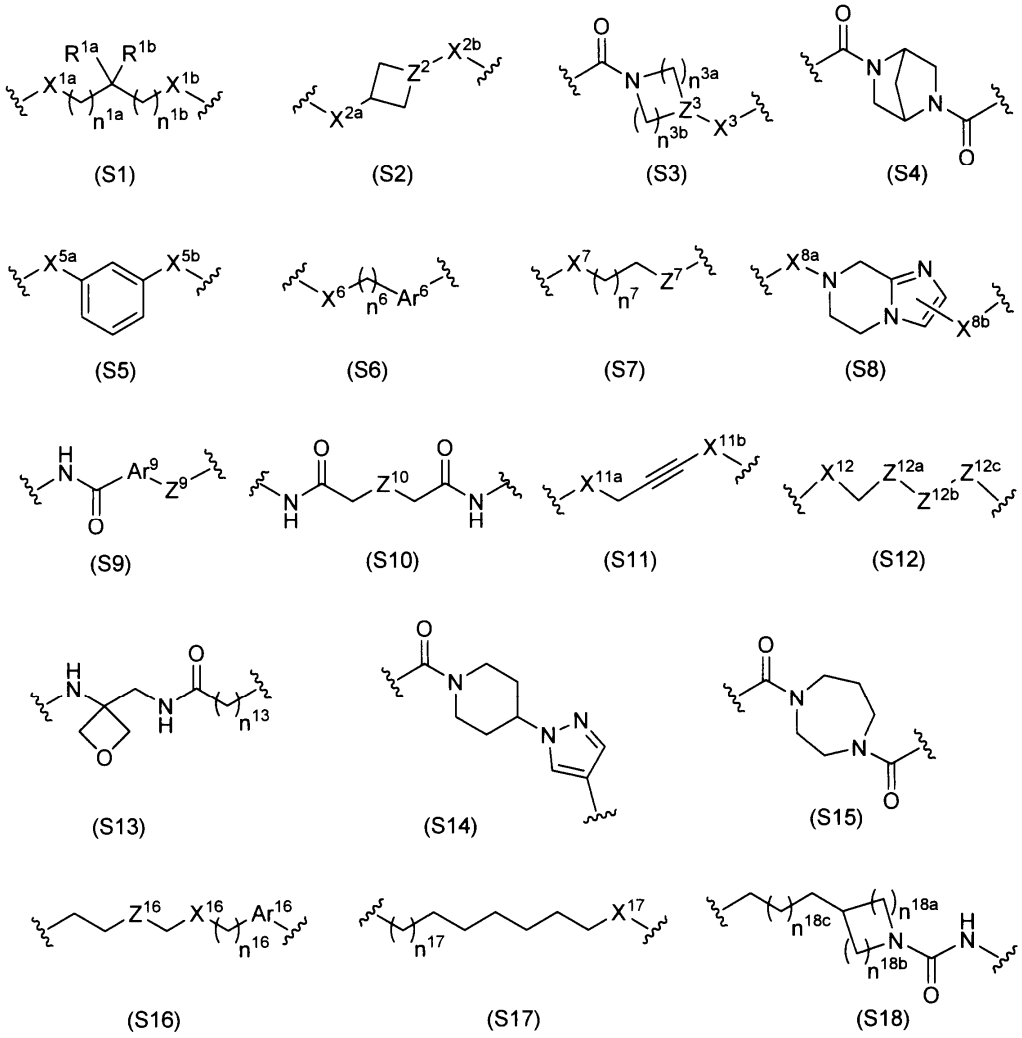
R^{E2} and R^{F2} have the same definition as R^{A2},

R^{E3} and R^{F3} have the same definition as R^{A3},

R^{E5} and R^{F5} have the same definition as R^{A5}, and

R^{F7} represents a hydrogen atom or a halogen);

[Chemical formula 3]



(wherein,

the wavy line represents a bonding site to L^1 or L^2,

n^{1a} and n^{1b} are the same or different and each represents 0 or 1,

X^{1a} and X^{1b} are the same or different and each represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH- (except for the cases where (i) X^{1a} is -NH-SO_2-, and X^{1b} is -SO_2-NH-, (ii) n^{1a} and n^{1b} are 0, X^{1a} is -C(=O)-NH-, -SO_2-NH-, -O-C(=S)-NH-, -O-C(=O)-NH-, or -NH-C(=O)-NH-, and X^{1b} is -NH-C(=O)-, -NH-SO_2-, -NH-C(=O)-O-, or -NH-C(=O)-NH-, and (iii) X^{1a} is -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH- and X^{1b} is -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH-),

R^{1a} represents a hydrogen atom and R^{1b} represents a hydrogen atom or lower alkyl, or R^{1a} and R^{1b} together represent carbonyl,

X^{2a} represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, or -NH-SO_2-,

X^{2b} represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, or -CH_2- (except for the case where X^{2a} is -NH-SO_2- and X^{2b} is -SO_2-NH-),

Z^2 represents CH or N (except for the cases where (i) Z^2 is N and X^{2b} is -NH-C(=O)-, -SO_2-NH-, or -NH-SO_2- and (ii) Z^2 is CH and X^{2b} is -CH_2-),

n^{3a} and n^{3b} are the same or different and each represents 1 or 2,

X^3 represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, -NH-C(=O)-NH-, or -NH-CH_2-,

Z^3 represents CH or N (except for the cases where (i) Z^3 is N and X^3 is -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, -NH-C(=O)-NH-, or -NH-CH_2- and (ii) Z^3 is N and n^{3a} or n^{3b} is 1),

X^{5a} and X^{5b} are the same or different and each represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, or -NH-SO_2- (except for the case where X^{5a} is -NH-SO_2- and X^{5b} is -SO_2-NH-),

n^6 represents 1 or 2,

Ar^6 represents triazolediyl, oxadiazolediyl, pyrazolediyl, thiophenediyl, or tetrahydropyridinediyl,

X^6 represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, -CH_2-NH- or -NH-C(=O)-NH- (except for the cases where (i) Ar^6 is oxadiazolediyl, pyrazolediyl, thiophenediyl, or tetrahydropyridinediyl and X^6 is -NH-SO_2- and (ii) n^6 is 1, Ar^6 is pyrazolediyl or tetrahydropyridinediyl, and X^6 is -C(=O)-NH-, -SO_2-NH-, -CH_2-NH-, or -NH-C(=O)-NH-),

X^7 represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, or -NH-C(=O)-NH-,

n^7 represents 1, 2, or 3,

Z^7 represents S, SO, or SO_2,

X^{8a} represents -C(=O)-, -CH_2-, or -NH-C(=O)-,

X^{8b} represents a bond, -C(=O)-, -CH_2-, or -CH(OH)-,

Ar^9 represents triazolediyl or oxazolediyl,

Z^9 represents CH_2 or NH (except for the cases where (i) Ar^9 is triazolediyl and Z^9 is NH and (ii) Ar^9 is oxazolediyl and Z^9 is CH_2),

Z^{10} represents O or NH,

X^{11a} represents -C(=O)-NH-, -SO_2-NH-, or -NH-C(=O)-NH-,

X^{11b} represents -C(=O)-NH- or -C(=O)-,

X^{12} represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, or -NH-C(=O)-NH-,

Z^{12a} represents CH_2 or NH (except for the case where X^{12} is -C(=O)-NH-, $-SO_2$-NH-, or -NH-C(=O)-NH- and Z^{12a} is NH),

Z^{12b} represents CH_2 or O (except for the case where Z^{12a} is NH and Z^{12b} is O),

Z^{12c} represents a bond, CH_2, or O (except for the cases where (i) Z^{12b} is O and Z^{12c} is O and (ii) Z^{12a} is NH and Z^{12c} is CH_2 or O),

n^{13} represents 0, 1 or 2,

n^{16} represents 1 or 2,

Z^{16} represents a bond, CH_2, or O,

X^{16} represents $-CH_2$-O-, -C(=O)-NH-, -NH-C(=O)-, or -NH-C(=O)-NH- (except for the case where Z^{16} is O and X^{16} is -NH-C(=O)- or -NH-C(=O)-NH-),

Ar^{16} represents triazolediyl, oxadiazolediyl or pyrazolediyl (except for the cases where (i) X^{16} is $-CH_2$-O- and Ar^{16} is oxadiazolediyl or pyrazolediyl and (ii) n^{16} is 1, X^{16} is -C(=O)-NH- or -NH-C(=O)-NH-, and Ar^{16} is pyrazolediyl),

n^{17} represents 1 or 2,

X^{17} represents -C(=O)-NH-, -NH-C(=O)-, $-NH-SO_2$-, or -NH-C(=O)-NH-, and

n^{18a}, n^{18b}, and n^{18c} are the same or different and each represents 1 or 2)).

[2] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), (B), (C), (D), or (F), L^2 represents a group represented by formula (A), (B), (C), or (D), and S is a group represented by formula (S1), provided that at least one of L^1 and L^2 is

a group represented by formula (A), or that both of L^1 and L^2 is a group represented by formula (B).

[3] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), L^2 represents a group represented by formula (A), and S is a group represented by formula (S2).

[4] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), (B), or (C), L^2 represents a group represented by formula (A) or (B), and S is a group represented by formula (S3), provided that at least one of L^1 and L^2 is a group represented by formula (A), or that both of L^1 and L^2 is a group represented by formula (B).

[5] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), L^2 represents a group represented by formula (A), and S is a group represented by formula (S4) or (S5).

[6] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), (B), (C), or (D), L^2 represents a group represented by formula (A), (B), or (D), and S is a group represented by formula (S6), provided that at least one of L^1 and L^2 is a

group represented by formula (A), or that both of L^1 and L^2 is a group represented by formula (B).

[7] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A) or (B), L^2 represents a group represented by formula (A), and S is a group represented by formula (S7).

[8] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A) or (B), L^2 represents a group represented by formula (A), and S is a group represented by formula (S8).

[9] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), L^2 represents a group represented by formula (A), and S is a group represented by formula (S9).

[10] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherin L^1 represents a group represented by formula (A) or (B), L^2 represents a group represented by formula (A), and S is a group represented by formula (S10).

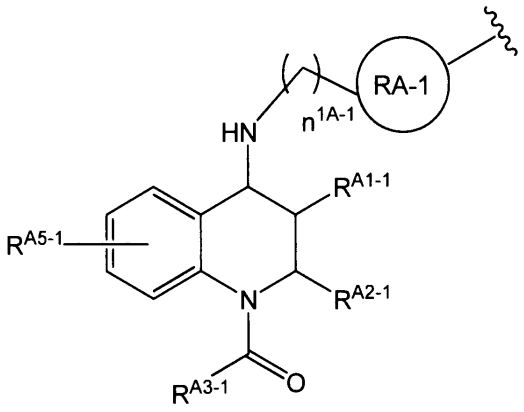
[11] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A) or (B), L^2 represents a group represented by formula (A) or (B), and S is a group represented by formula (S11).

[12] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (A), L^2 represents a group represented by formula (A), and S is a group represented by formula (S12), (S13), (S14), or (S15).

[13] The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein L^1 represents a group represented by formula (E), L^2 represents a group represented by formula (A), and S is a group represented by formula (S16), (S17), or (S18).

[14] The compound according to any one of claims 1 to 13 or a pharmaceutically acceptable salt thereof, wherein formula (A) is the following formula (A)-1:

[Chemical formula 4]



(A)-1

(wherein,

the wavy line represents the bonding site to S,

R^{A1-1} represents a hydrogen atom,

R^{A2-1} and R^{A3-1} are the same or different and each represents alkyl having 1 to 5 carbon atoms,

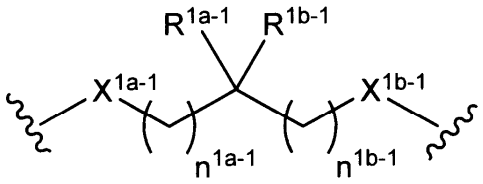
R^{A5-1} represents a hydrogen atom, a fluorine atom, optionally substituted alkyl having 1 to 5 carbon atoms, optionally substituted alkenyl having 2 to 6 carbon atoms, or optionally substituted tetrahydropyridinyl,

ring RA-1 represents benzenediyl, cycloalkanediyl, pyridinediyl, or piperidinediyl, and

n^{1A-1} represents 0 or 1).

[15] The compound according to claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein S is the following formula (S1)-1:

[Chemical formula 5]



(S1)-1

(wherein,

the wavy line represents the bonding site to L^1 or L^2,

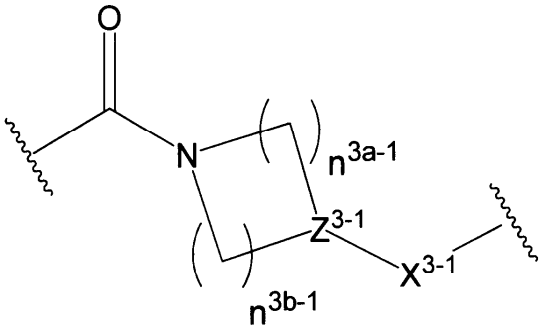
n^{1a-1} and n^{1b-1} are the same or different and each represents 0 or 1,

X^{1a-1} and X^{1b-1} are the same or different and each represents -C(=O)-NH-, -NH-C(=O)-, -SO_2-NH-, -NH-SO_2-, -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH- (except for the cases where (i) X^{1a-1} is -NH-SO_2- and X^{1b-1} is -SO_2-NH-, (ii) n^{1a-1} and n^{1b-1} are 0, X^{1a-1} is -C(=O)-NH-, -SO_2-NH-, -O-C(=S)-NH-, -O-C(=O)-NH-, or -NH-C(=O)-NH-, and X^{1b-1} is -NH-C(=O)-, -NH-SO_2-, -NH-C(=O)-O-, or -NH-C(=O)-NH-, and (iii) X^{1a-1} is -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH- and X^{1b-1} is -O-C(=S)-NH-, -O-C(=O)-NH-, -NH-C(=O)-O-, or -NH-C(=O)-NH-), and

R^{1a-1} represents a hydrogen atom and R^{1b-1} represents a hydrogen atom or an alkyl having 1 to 5 carbon atoms, or R^{1a-1} and R^{1b-1} together represent carbonyl).

[16] The compound according to claim 1 or 4, or a pharmaceutically acceptable salt thereof, wherein S is the following formula (S3)-1:

[Chemical formula 6]



(S3)-1

(wherein,

the wavy line represents the bonding site to L^1 or L^2,

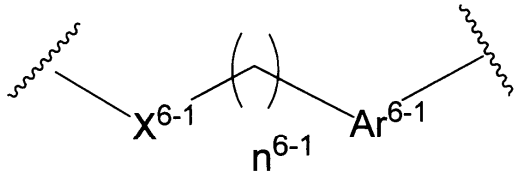
n^{3a-1} and n^{3b-1} are the same or different and each represents 1 or 2,

X^{3-1} represents -C(=O)-NH-, -NH-C(=O)-, -NH-C(=O)-NH-, or -NH-CH_2-, and

Z^{3-1} represents CH or N (except for the cases where (i) Z^{3-1} is N and X^{3-1} is -NH-C(=O)-, -NH-C(=O)-NH-, or -NH-CH_2- and (ii) Z^{3-1} is N and n^{3a-1} or n^{3b-1} is 1)).

[17] The compound according to claim 1 or 6, or a pharmaceutically acceptable salt thereof, wherein S is the following formula (S6)-1:

[Chemical formula 7]



(S6)-1

(wherein,

the wavy line represents the bonding site to L^1 or L^2,

n^{6-1} represents 1 or 2,

Ar^{6-1} represents triazolediyl, oxadiazolediyl, pyrazolediyl, thiophenediyl, or tetrahydropyridinediyl, and

X^{6-1} represents -C(=O)-NH-, -NH-C(=O)-, or $-CH_2$-NH- (except for the case where (i) n^{6-1} is 1, Ar^{6-1} is pyrazolediyl or tetrahydropyridinediyl, and X^{6-1} is -C(=O)-NH- or $-CH_2$-NH-)).

[18] A pharmaceutical composition comprising the compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof.

[19] The pharmaceutical composition according to claim 18, further comprising a carrier.

[20] The pharmaceutical composition according to claim 18 or 19 for inhibiting BET.

[21] The pharmaceutical composition according to claim 18 or 19 for treatment or prevention of cancer.

[22] The compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof for use as a medicine.

[23] The compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof for use in the treatment or prevention of cancer.

[24] Use of the compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof for the manufacture of a medicament for treating or preventing cancer.

[25] A medicine comprising the compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof as an active ingredient.

[26] A prophylactic or therapeutic agent for cancer, comprising the compound according to any one of claims 1 to 17 or a pharmaceutically acceptable salt thereof as an active ingredient.