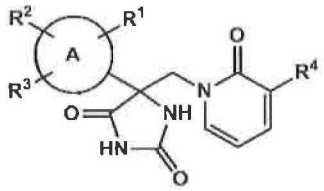
CLAIMS

[Claim 1]

A composition used in vitro for maintaining a function of platelets, the composition comprising as an active ingredient a pyridone derivative, or a salt thereof, represented by formula (I),

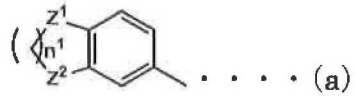
[Formula 1]



(I)

[wherein ring A represents an aryl, a heteroaryl, or a group represented by the following formula (a),

[Formula 2]



(wherein Z^1 and Z^2 each independently represent $-CH_2-$ or -O-, and n^1 denotes an integer of 1 to 3),

R^1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group, or $-J^1-X^1-R^5$ {wherein J^1 represents a single bond, alkylene, alkenylene, or alkynylene, X^1 represents a single bond, an oxygen atom, a sulfur atom, SO, SO_2, -CO-, $-NR^6-$, $-NR^6SO_2-$, $-SO_2NR^6-$, $-NR^6CO-$, $-CONR^6-$, $-NR^6COO-$, $-OCONR^6-$, $-NR^6CONR^7-$, or $-NR^6SO_2NR^7-$ (wherein R^6 and R^7 each independently represent a hydrogen atom or a C1-C6 alkyl group),

R^5 represents a hydrogen atom, a trifluoromethyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, a group represented by the following

formula (b):

[Formula 3]



. . . . (b)

(wherein n^2 denotes an integer of 1 to 3 and n^3 denotes an integer of 0 to 3),an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group},

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, a C1-C6 alkoxy group, a C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group,

R^3 represents a hydrogen atom, a halogen atom, or a C1-C6 alkyl group, and

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a hydoxymethyl group, a C1-C6 alkyl group, or a C2-C6 alkenyl group].

[Claim 2]

The composition according to claim 1, wherein a compound represented by the formula (I) is (+)-5-(3,4-difluorophenyl)-5-[(3-methyl-2-oxopyridin-1(2H)-yl)methyl]imidazolidine-2,4-dione.

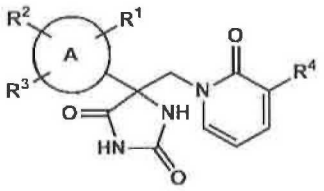
[Claim 3]

The composition according to claim 1 or 2, wherein the composition is a reagent for maintaining a function of platelets or is an additive to a platelet-containing blood product.

[Claim 4]

A method for preparing platelets, the method comprising adding, to a culture system for differentiating megakaryocytes from cells capable of differentiating into megakaryocytes and producing platelets from the megakaryocytes, a pyridone derivative, or a salt thereof, represented by formula (I),

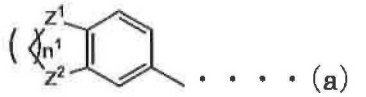
[Formula 4]



(I)

[wherein ring A represents an aryl, a heteroaryl, or a group represented by the following formula (a),

[Formula 5]



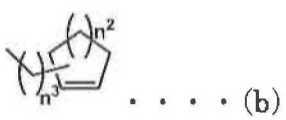
(a)

(wherein Z^1 and Z^2 each independently represent $-CH_2-$ or -O-, and n^1 denotes an integer of 1 to 3),

R^1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group, or $-J^1-X^1-R^5$ {wherein J^1 represents a single bond, alkylene, alkenylene, or alkynylene, X^1 represents a single bond, an oxygen atom, a sulfur atom, SO, SO_2, -CO-, $-NR^6-$, $-NR^6SO_2-$, $-SO_2NR^6-$, $-NR^6CO-$, $-CONR^6-$, $-NR^6COO-$, $-OCONR^6-$, $-NR^6CONR^7-$, or $-NR^6SO_2NR^7-$ (wherein R^6 and R^7 each independently represent a hydrogen atom or a C1-C6 alkyl group),

R^5 represents a hydrogen atom, a trifluoromethyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, a group represented by the following formula (b):

[Formula 6]



(b)

(wherein n^2 denotes an integer of 1 to 3 and n^3 denotes an integer of 0 to 3),an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group},

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, a C1-C6 alkoxy group, a C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group,

R^3 represents a hydrogen atom, a halogen atom, or a C1-C6 alkyl group, and

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a hydoxymethyl group, a C1-C6 alkyl group, or a C2-C6 alkenyl group].

[Claim 5]

The method according to claim 4, wherein a compound represented by the formula (I) is (+)-5-(3,4-difluorophenyl)-5-[(3-methyl-2-oxopyridin-1(2H)-yl)methyl]imidazolidine-2,4-dione.

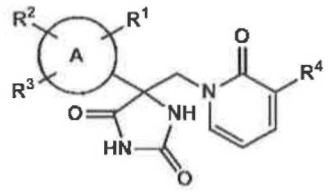
[Claim 6]

The method according to claim 4 or 5, wherein a culture temperature in the culture system is from 35 to 39°C.

[Claim 7]

A culture obtained by adding, to a culture system for differentiating megakaryocytes from cells capable of differentiating into megakaryocytes and producing platelets from the megakaryocytes, a pyridone derivative, or a salt thereof, represented by formula (I),

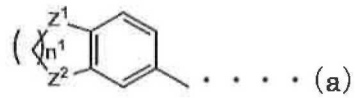
~~[Formula 7]~~



(I)

[wherein ring A represents an aryl, a heteroaryl, or a group represented by the following formula (a),

~~[Formula 8]~~



(wherein Z^1 and Z^2 each independently represent $-CH_2-$ or -O-, and n^1 denotes an integer of 1 to 3),

R^1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group, or $-J^1-X^1-R^5$ {wherein J^1 represents a single bond, alkylene, alkenylene, or alkynylene, X^1 represents a single bond, an oxygen atom, a sulfur atom, SO, SO_2, -CO-, $-NR^6-$, $-NR^6SO_2-$, $-SO_2NR^6-$, $-NR^6CO-$, $-CONR^6-$, $-NR^6COO-$, $-OCONR^6-$, $-NR^6CONR^7-$, or $-NR^6SO_2NR^7-$ (wherein R^6 and R^7 each independently represent a hydrogen atom or a C1-C6 alkyl group),

R^5 represents a hydrogen atom, a trifluoromethyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, a group represented by the following formula (b):

~~[Formula 9]~~



(wherein n^2 denotes an integer of 1 to 3 and n^3 denotes an integer of 0 to 3),an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group},

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, a C1-C6 alkoxy group, a C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally

substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group,

R^3 represents a hydrogen atom, a halogen atom, or a C1-C6 alkyl group, and

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a hydoxymethyl group, a C1-C6 alkyl group, or a C2-C6 alkenyl group].

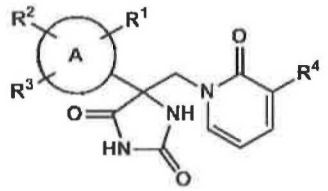
[Claim 8]

The culture according to claim 7, wherein a compound represented by the formula (I) is (+)-5-(3,4-difluorophenyl)-5-[(3-methyl-2-oxopyridin-1(2H)-yl)methyl]imidazolidine-2,4-dione.

[Claim 9]

A platelet-containing blood product to which has been added a pyridone derivative, or a salt thereof, represented by formula (I),

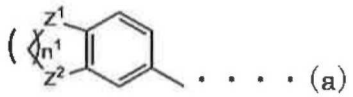
~~[Formula 10]~~



(I)

[wherein ring A represents an aryl, a heteroaryl, or a group represented by the following formula (a),

~~[Formula 11]~~



(a)

(wherein Z^1 and Z^2 each independently represent $-CH_2-$ or -O-, and n^1 denotes an integer of 1 to 3),

R^1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally

substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group, or $-J^1-X^1-R^5$ {wherein J^1 represents a single bond, alkylene, alkenylene, or alkynylene, X^1 represents a single bond, an oxygen atom, a sulfur atom, SO, SO_2, -CO-, $-NR^6-$, $-NR^6SO_2-$, $-SO_2NR^6-$, $-NR^6CO-$, $-CONR^6-$, $-NR^6COO-$, $-OCONR^6-$, $-NR^6CONR^7-$, or $-NR^6SO_2NR^7-$ (wherein R^6 and R^7 each independently represent a hydrogen atom or a C1-C6 alkyl group),

R^5 represents a hydrogen atom, a trifluoromethyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, a group represented by the following formula (b):

~~[Formula 12]~~



. . . . (b)

(wherein n^2 denotes an integer of 1 to 3 and n^3 denotes an integer of 0 to 3),an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group},

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, a C1-C6 alkoxy group, a C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group,

R^3 represents a hydrogen atom, a halogen atom, or a C1-C6 alkyl group, and

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a hydoxymethyl group, a C1-C6 alkyl group, or a C2-C6 alkenyl group].

[Claim 10]

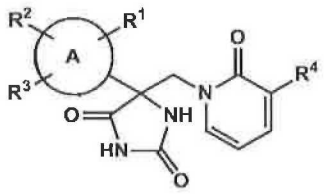
The blood product according to claim 9, wherein a compound represented by the formula

(I) is (+)-5-(3,4-difluorophenyl)-5-[(3-methyl-2-oxopyridin-1(2H)-yl)methyl]imidazolidine-2,4-dione.

[Claim 11]

A method for maintaining a function of platelets in a blood product, the method comprising adding, to a platelet-containing blood product, a pyridone derivative, or a salt thereof, represented by formula (I),

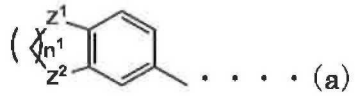
~~[Formula 13]~~



(I)

[wherein ring A represents an aryl, a heteroaryl, or a group represented by the following formula (a),

~~[Formula 14]~~



(a)

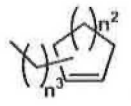
(wherein Z^1 and Z^2 each independently represent $-CH_2-$ or -O-, and n^1 denotes an integer of 1 to 3),

R^1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted cycloalkenyl group, an optionally substituted cycloalkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group, or $-J^1-X^1-R^5$ {wherein J^1 represents a single bond, alkylene, alkenylene, or alkynylene, X^1 represents a single bond, an oxygen atom, a sulfur atom, SO, SO_2, -CO-, $-NR^6-$, $-NR^6SO_2-$, $-SO_2NR^6-$, $-NR^6CO-$, $-CONR^6-$, $-NR^6COO-$, $-OCONR^6-$, $-NR^6CONR^7-$, or $-NR^6SO_2NR^7-$ (wherein R^6 and R^7 each independently represent a hydrogen atom or a C1-C6 alkyl group),

R^5 represents a hydrogen atom, a trifluoromethyl group, an optionally substituted C1-C6 alkyl group, an optionally substituted C1-C6 alkoxy group, an optionally substituted cycloalkyl

group, an optionally substituted cycloalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, a group represented by the following formula (b):

~~[Formula 15]~~



. . . . (b)

(wherein n^2 denotes an integer of 1 to 3 and n^3 denotes an integer of 0 to 3),an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group},

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, a C1-C6 haloalkyl group, a carboxyl group, an optionally substituted C1-C6 alkyl group, a C1-C6 alkoxy group, a C1-C6 alkoxycarbonyl group, an optionally substituted cycloalkyl group, an optionally substituted cyclohexylalkylalkyl group, an optionally substituted heterocycloalkyl group, an optionally substituted heterocycloalkylalkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted C2-C6 alkenyl group, an optionally substituted alkenylalkyl group, an optionally substituted heterocycloalkenyl group, an optionally substituted heterocycloalkenylalkyl group, an optionally substituted C2-C6 alkynyl group, or an optionally substituted alkynylalkyl group,

R^3 represents a hydrogen atom, a halogen atom, or a C1-C6 alkyl group, and

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a hydoxymethyl group, a C1-C6 alkyl group, or a C2-C6 alkenyl group].

[Claim 12]

The method according to claim 11, wherein a compound represented by the formula (I) is (+)-5-(3,4-difluorophenyl)-5-[(3-methyl-2-oxopyridin-1(2H)-yl)methyl]imidazolidine-2,4-dione.