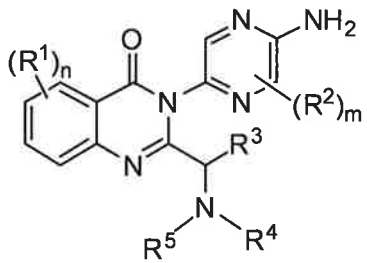
What is claimed:

1. A compound having the structure of formula (I):



(I)

wherein:

n is 1, 2, or 3;

m is 0 or 1;

each R^1 is independently selected from halo, cyano, optionally substituted C_{1-6} alkyl, optionally substituted C_{1-6} haloalkyl, optionally substituted C_{1-6} alkoxy, optionally substituted sulfonyl, optionally substituted C_{3-8} aryl, optionally substituted C_{3-8} heteroaryl, optionally substituted C_{3-8} cycloalkyl, and optionally substituted C_{3-8} heterocycloalkyl;

each R^2 is independently selected from halo and optionally substituted C_{1-6} alkyl;

R^3 is hydrogen, optionally substituted C_{1-6} alkyl, optionally substituted C_{6-10} aryl, or optionally substituted C_{3-8} cycloalkyl;

R^4 is a six- to twelve-membered heteroaryl having at least one aromatic group and at least two heteroatoms, wherein the heteroatoms are selected from N, O, and S, wherein the heteroaryl is unsubstituted or substituted with one, two, or three members independently selected from halo, cyano, optionally substituted haloalkyl, optionally substituted C_{1-6} alkyl, and $-NH_2$; and

R^5 is hydrogen or optionally substituted C_{1-6} alkyl, wherein R^5 and R^3 together with the atoms to which they are attached optionally form a four to seven-membered heterocyclic ring;

or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof;

wherein the term "cycloalkyl" refers to a saturated or partially saturated cyclic alkyl group;

wherein the term "optionally substituted" means that any one or more hydrogen atoms on the designated group may or may not be replaced with substituents selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, acyl, amino, amido, amidino, aryl, azido,

carbamoyl, carboxyl, carboxyl ester, cyano, guanidino, halo, haloalkyl, heteroalkyl, heteroaryl, heterocycloalkyl, hydroxy, hydrazino, imino, oxo, nitro, alkylsulfinyl, sulfonic acid, alkylsulfonyl, thiocyanate, thiol, and thione.

2. The compound of claim 1, wherein

n is 1 or 2;

m is 0 or 1;

each R^1 is independently selected from halo, C_{1-6} alkyl, and C_{1-6} haloalkyl;

each R^2 is independently selected from C_{1-6} alkyl;

R^3 is hydrogen, C_{1-6} alkyl, or C_{3-8} cycloalkyl;

R^4 is a six- to twelve-membered heteroaryl having at least one aromatic ring and at least two nitrogen atoms, wherein the heteroaryl is unsubstituted or substituted with one, two, or three members independently selected from halo, cyano, $-NH_2$, C_{1-6} haloalkyl, and C_{1-6} alkyl; and

R^5 is hydrogen, methyl, ethyl, or propyl, or R^5 and R^3 together with the atoms to which they are attached optionally form a five-membered heterocyclic ring;

or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof;

wherein the term "cycloalkyl" refers to a saturated or partially saturated cyclic alkyl group.

3. The compound of claim 1 or claim 2, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein each R^1 is independently selected from chloro, bromo, fluoro, methyl, ethyl, and propyl.

4. The compound of claim 1 or claim 2, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein each R^1 is halo.

5. The compound of claim 4, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein each R^1 is independently selected from chloro, bromo and fluoro.

6. The compound of any one of claims 1-5, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein each R^2 is independently selected from methyl, ethyl, and propyl.

7. The compound of any one of claims 1-6, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^3 is hydrogen, methyl, ethyl, propyl, butyl, cyclopropyl, or cyclobutyl.

8. The compound of any one of claims 1-7, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^5 is hydrogen, methyl, ethyl, or propyl.

9. The compound of any one of claims 1-8, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^5 and R^3 together with the atoms to which they are attached optionally form pyrrolidinyl.

10. The compound of any one of claims 1-8, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^5 is hydrogen.

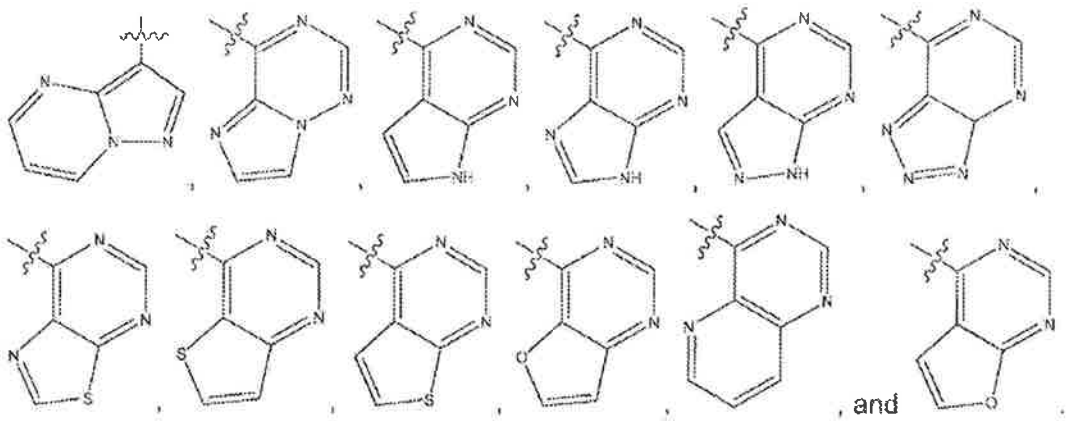
11. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^4 is a monocyclic heteroaryl having at least two nitrogen atoms, wherein R^4 is unsubstituted or substituted with two or three members independently selected from bromo, chloro, fluoro, cyano, methyl, ethyl, propyl, fluoromethyl, difluoromethyl, trifluoromethyl, fluoroethyl, difluoroethyl, trifluoroethyl, fluoropropyl, difluoropropyl, trifluoropropyl, and -NH_2.

12. The compound of any one of claims 1-11, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^4 is pyrimidinyl substituted with two or three members selected from the group consisting of bromo, chloro, fluoro, cyano, methyl, ethyl, propyl, fluoromethyl,

difluoromethyl, trifluoromethyl, fluoroethyl, difluoroethyl, trifluoroethyl, fluoropropyl, difluoropropyl, trifluoropropyl, and $-NH_2$.

13. The compound of any one of claims 1-10, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^4 is a bicyclic heteroaryl having at least two nitrogen atoms, wherein R^4 is unsubstituted or substituted with one, two, or three members independently selected from halo, cyano, $-NH_2$, C_{1-6} haloalkyl, and C_{1-6} alkyl.

14. The compound of claim 13, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; wherein R^4 is selected from the group consisting of:



15. The compound of any one of claims 1-14, wherein the compound is an (S)-enantiomer.

16. The compound of any one of claims 1-14, wherein the compound is an (R)-enantiomer.

17. The compound of claim 1, wherein the compound is selected from the group consisting of:

(S)-3-(5-aminopyrazin-2-yl)-5-chloro-2-(1-((2,6-diamino-5-chloropyrimidin-4-yl)amino)ethyl)-8-fluoroquinazolin-4(3H)-one;

(S)-2,4-diamino-6-((1-(3-(5-aminopyrazin-2-yl)-5-chloro-8-fluoro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-4-amino-6-((1-(3-(5-aminopyrazin-2-yl)-5-chloro-8-fluoro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-2-(1-((3H-[1,2,3]triazolo[4,5-d]pyrimidin-7-yl)amino)ethyl)-3-(5-aminopyrazin-2-yl)-8-fluoroquinazolin-4(3H)-one;

(S)-3-(5-aminopyrazin-2-yl)-5-chloro-8-fluoro-2-(1-(furo[2,3-d]pyrimidin-4-ylamino)ethyl)quinazolin-4(3H)-one;

(S)-2,4-diamino-6-((1-(3-(5-aminopyrazin-2-yl)-5-chloro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-3-(5-aminopyrazin-2-yl)-5-chloro-2-(1-((2,6-diamino-5-chloropyrimidin-4-yl)amino)ethyl)quinazolin-4(3H)-one;

(S)-3-(5-aminopyrazin-2-yl)-5-chloro-2-(cyclopropyl((2,6-diamino-5-chloropyrimidin-4-yl)amino)methyl)quinazolin-4(3H)-one;

(S)-2,4-diamino-6-(((3-(5-aminopyrazin-2-yl)-5-chloro-4-oxo-3,4-dihydroquinazolin-2-yl)(cyclopropyl)methyl)amino)pyrimidine-5-carbonitrile;

(S)-2,4-diamino-6-(((3-(5-aminopyrazin-2-yl)-5,8-dichloro-4-oxo-3,4-dihydroquinazolin-2-yl)(cyclopropyl)methyl)amino)pyrimidine-5-carbonitrile;

(S)-2,4-diamino-6-((1-(3-(5-aminopyrazin-2-yl)-5,8-dichloro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-3-(5-aminopyrazin-2-yl)-5,8-dichloro-2-(cyclopropyl((2,6-diamino-5-chloropyrimidin-4-yl)amino)methyl)quinazolin-4(3H)-one;

(S)-3-(5-aminopyrazin-2-yl)-5,8-dichloro-2-(1-((2,6-diamino-5-chloropyrimidin-4-yl)amino)ethyl)quinazolin-4(3H)-one;

(S)-2-amino-4-((1-(3-(5-aminopyrazin-2-yl)-8-chloro-6-fluoro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)-6-(difluoromethyl)pyrimidine-5-carbonitrile;

(S)-2,4-Diamino-6-((1-(3-(5-aminopyrazin-2-yl)-6,8-difluoro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-3-(5-Aminopyrazin-2-yl)-2-(1-((2,6-diamino-5-chloropyrimidin-4-yl)amino)ethyl)-6,8-difluoroquinazolin-4(3H)-one;

(S)-2,4-Diamino-6-((1-(3-(5-aminopyrazin-2-yl)-8-chloro-6-fluoro-4-oxo-3,4-dihydroquinazolin-2-yl)ethyl)amino)pyrimidine-5-carbonitrile;

(S)-3-(5-Aminopyrazin-2-yl)-8-chloro-2-(1-((2,6-diamino-5-chloropyrimidin-4-yl)amino)ethyl)-6-fluoroquinazolin-4(3H)-one;

(S)-2-(1-((6-Amino-5-chloropyrimidin-4-yl)amino)ethyl)-3-(5-aminopyrazin-2-yl)-5-chloroquinazolin-4(3H)-one;

(S)-2-(((6-Amino-5-chloropyrimidin-4-yl)amino)(cyclopropyl)methyl)-3-(5-aminopyrazin-2-yl)-5,8-dichloroquinazolin-4(3H)-one; and
(S)-2-(((6-Amino-5-chloropyrimidin-4-yl)amino)(cyclopropyl)methyl)-3-(5-aminopyrazin-2-yl)-5-chloroquinazolin-4(3H)-one;
or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof.

18. The compound of any one of claims 1-17, or a pharmaceutically acceptable salt thereof.

19. A pharmaceutical composition comprising the compound of any one of claims 1-18, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; and at least one pharmaceutically acceptable vehicle.

20. A pharmaceutical composition comprising the compound according to any one of claims 1-17, or a pharmaceutically acceptable sale thereof, and at least one pharmaceutically acceptable vehicle.

21. Use of a compound, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof according to any one of claims 1-18 for the manufacture of a medicament for treating a disease or condition associated with PI3K, wherein the the disease or condition is selected from cancer, hematologic malignancies, leukemias, lymphomas, myeloproliferative disorders, myelodysplastic syndromes, plasma cell neoplasms, solid tumor, inflammation, fibrosis, autoimmune disorders, allergic conditions, hypersensitivity, cardiovascular diseases, neurodegenerative diseases, renal disorders, viral infections, obesity, and autoimmune diseases.

22. A kit comprising the compound of any one of claims 1-18, or a pharmaceutically acceptable salt, double bond isomer, racemate, stereoisomer, enantiomer, diastereoisomer, atropisomer, or a mixture thereof; and a label and/or instructions for use.