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전체 청구항 수 : 총 11 항

심사관 : 김범수

(54) 발명의 명칭 피리미딘 유도체

(57) 요약

본 명세서에서 식(I)로 표시된 피리미딘 화합물들이 개시된다. 또한, 상기 화합물을 사용하여 예컨대, 암 또는 노인성황반변성과 같은 혈관신생 관련 질환을 치료하는 방법이 개시된다.

(72) 발명자

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꾸이, 유민

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차이나, 상하이, 장지양 하이테크 파크, 난 후이,
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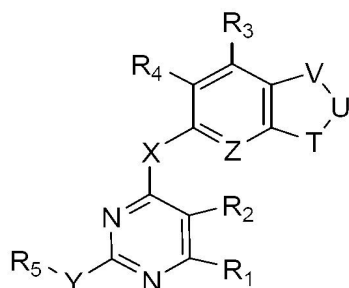
차이나, 상하이, 푸둥, 푸둥, 801 잉화 로드, 빌딩
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명세서

청구범위

청구항 1

하기 화학식의 화합물 또는 이의 약학적으로 허용가능한 염:

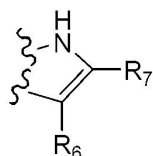


상기 식 중,

X는 O 또는 NH이고;

Y는 NH이며;

Z는 CR'이고, 여기서 R'은 H, 할로 또는 알킬이고;



V, U 및 T는 함께 를 나타내며;

R₁, R₃, R₄ 및 R₆의 각각은 독립적으로 H, 할로, 니트로, 아미노, 시아노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 카르보닐아미노, 술폰닐아미노, 아미노카르보닐 또는 아미노술폰닐이고;

R₂는 H, 할로, 니트로, 아미노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 카르보닐아미노, 술폰닐아미노, 아미노카르보닐 또는 아미노술폰닐이며;

R₅는 알킬, 사이클로알킬, 헤테로사이클로알킬, 아릴 또는 헤테로아릴이고;

R₇은 알킬이며;

여기서, 알킬, 사이클로알킬, 헤테로사이클로알킬, 아릴, 헤테로아릴 및 알콕시는 할로, 히드록실, 아미노, 시아노, 니트로, 메르캅토, 알콕시카르보닐, 아미도, 카르복시, 알칸술폰닐, 알킬카르보닐, 카르바미도, 카르바밀, 카르복실, 티오우레이도, 티오시아나토, 술폰아미도, 알킬, 알케닐, 알키닐, 알킬옥시, 아릴, 헤테로아릴, 사이클로알킬 및 헤테로사이클로알킬로부터 선택된 1 이상의 기에 의해 선택적으로 치환되고, 여기서 알킬, 알케닐, 알키닐, 알킬옥시, 아릴, 헤테로아릴, 사이클로알킬 및 헤테로사이클로알킬은 추가로 치환될 수 있다.

청구항 2

제1항에 있어서, R₆은 H이고, R₇은 메틸인 것인 화합물 또는 이의 약학적으로 허용가능한 염.

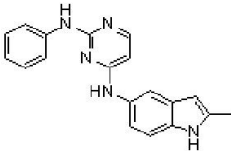
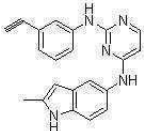
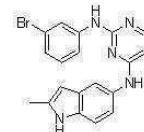

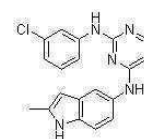
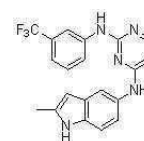
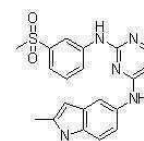
청구항 3

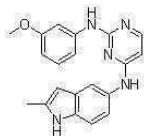
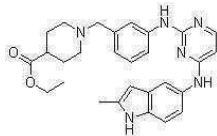
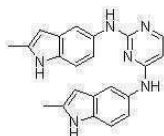
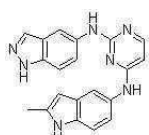
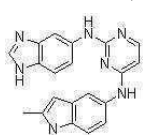
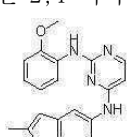
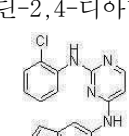
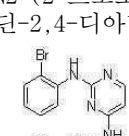
제1항에 있어서, R₅는 할로, 니트로, 아미노, 시아노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 술폰닐, 카르보

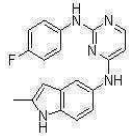
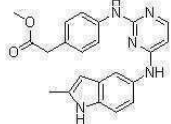
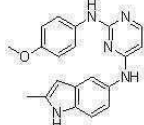
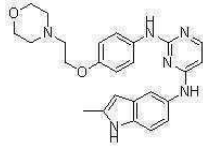

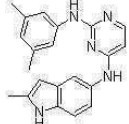
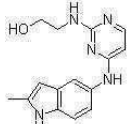
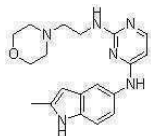
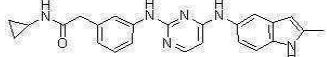
닐아미노, 술폰닐아미노, 아미노카르보닐 또는 아미노술폰닐로 선택적으로 치환된 아릴 또는 헤테로아릴인 것인 화합물 또는 이의 약학적으로 허용가능한 염.

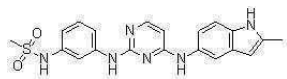
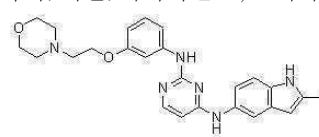
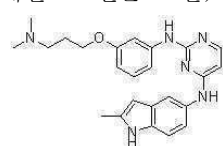
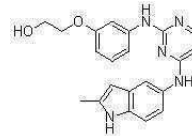
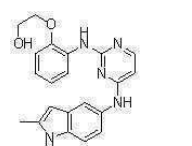
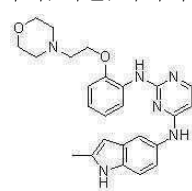
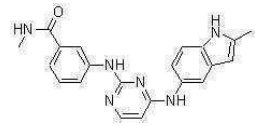
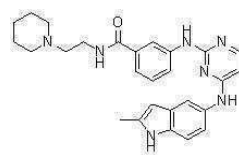
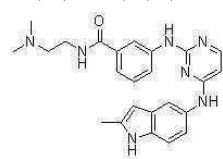
청구항 4

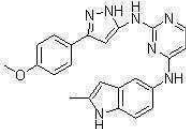
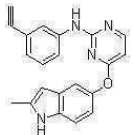
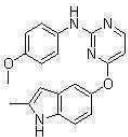
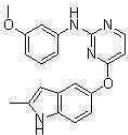
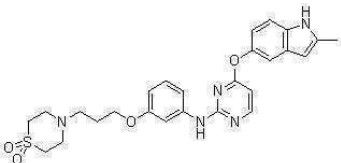
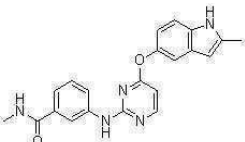
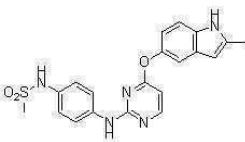
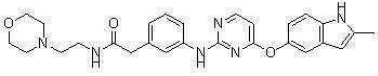
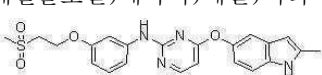
제1항에 있어서, 상기 화합물은 하기 화합물 중 하나인 것인 화합물 또는 이의 약학적으로 허용가능한 염:

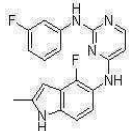


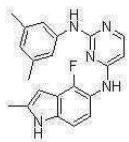
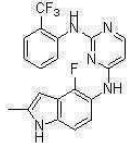
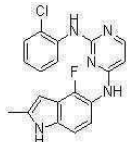

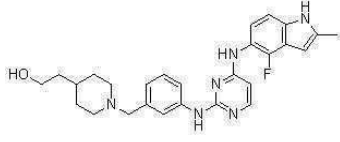
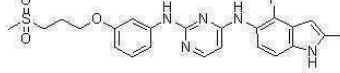
화합물	명칭/구조
1	N4-(2-메틸-1H-인돌-5-일)-N2-페닐피리미딘-2,4-디아민 
2	N2-(3-에티닐페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
3	N2-(3-브로모페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
4	N2-(3-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
5	N2-(3-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
6	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(트리플루오로메틸)페닐)피리미딘-2,4-디아민 
7	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(메틸술폰닐)페닐)피리미딘-2,4-디아민 

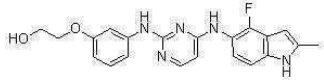
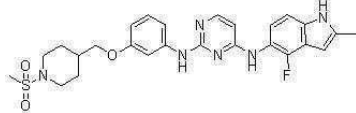
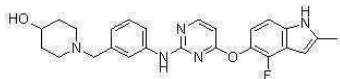
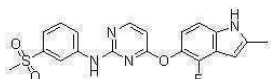
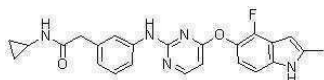
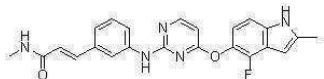
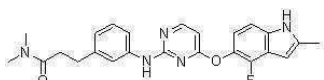
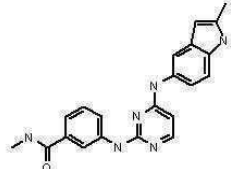
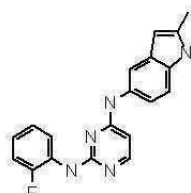
8	N2-(3-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
9	에틸 1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-카르복실레이트 
10	N2,N4-비스(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
11	N2-(1H-인다졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
12	N2-(1H-벤조[d]이미다졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
13	N2-(2-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
14	N2-(2-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
15	N2-(2-브로모페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 

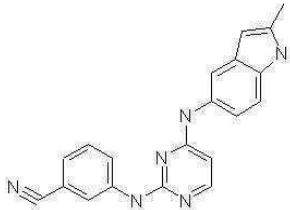
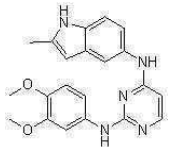
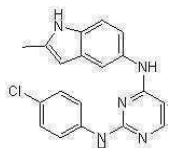
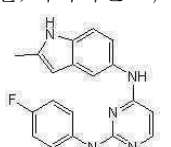
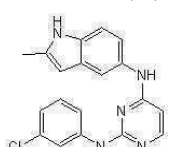
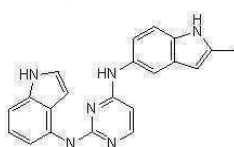
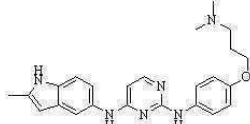
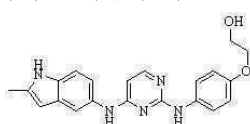
16	N2-(4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
17	메틸 2-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세테이트 
19	N2-(4-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
20	N4-(2-메틸-1H-인돌-5-일)-N2-(4-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
21	N2-(3,4-디플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
22	N2-(3,5-디메틸페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
23	2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)에탄올 
24	N4-(2-메틸-1H-인돌-5-일)-N2-(2-모르폴리노에틸)피리미딘-2,4-디아민 
25	N-사이클로프로필-2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세트아미드 

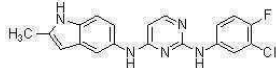
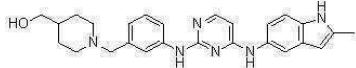
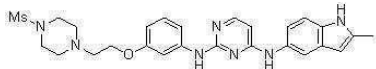
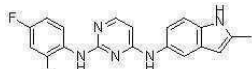
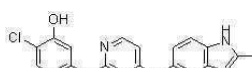
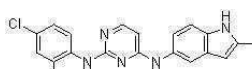
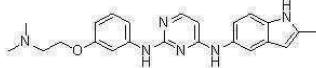
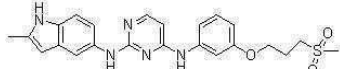
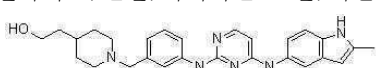
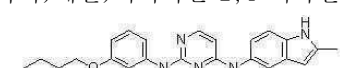
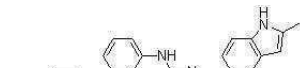
28	N-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 
29	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
30	N2-(3-(3-(디메틸아미노)프로폭시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
31	 2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올
32	 2-(2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올
33	N4-(2-메틸-1H-인돌-5-일)-N2-(2-(2-(모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
34	N-메틸-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 
35	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드 
36	N-(2-(디메틸아미노)에틸)-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 

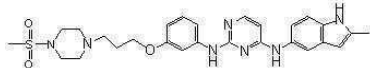
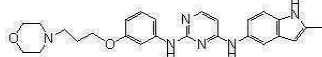
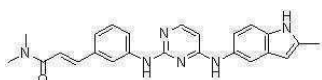
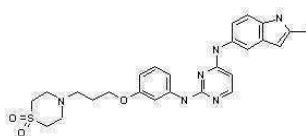
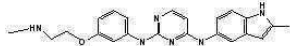
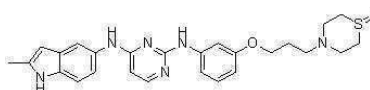
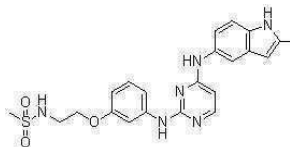
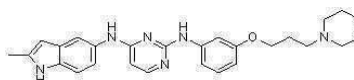
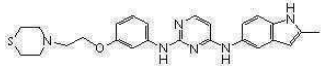
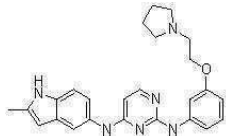
37	N-(3-(4-메톡시페닐)-1H-피라졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
38	N-(3-에틸닐페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
39	N-(4-메톡시페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
42	N-(3-메톡시페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
43	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 
44	N-메틸-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 
48	N-(4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 
49	2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드 
50	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술포닐)에톡시)페닐)피리미딘-2-아민 

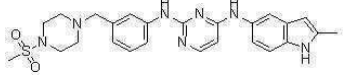
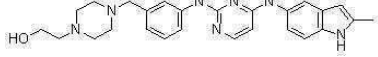
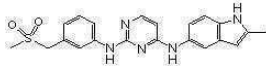
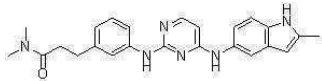
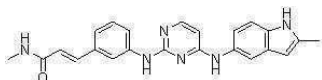
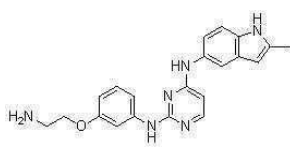
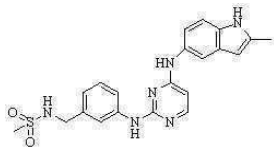
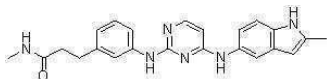
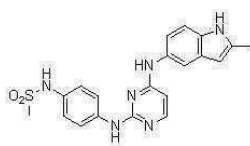
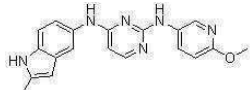
52	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-플루오로페닐)피리미딘-2,4-디아민 
53	N2-(3-클로로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
54	2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 
55	N2-(3,5-디메틸페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
56	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-(트리플루오로메틸)페닐)피리미딘-2,4-디아민 
57	N2-(2-클로로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
59	N4-(4-프루오로-2-메틸-1H-인돌-5-일)-N2-(4-메톡시페닐)피리미딘-2,4-디아민 
61	2-(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 
62	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(3-(메틸술포닐)프로폭시)페닐)피리미딘-2,4-디아민 

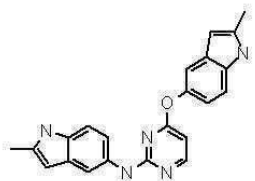
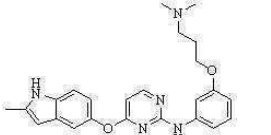
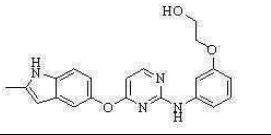
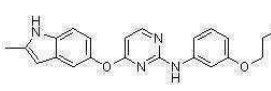
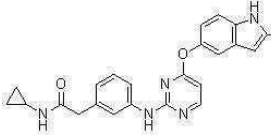
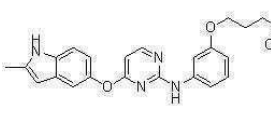
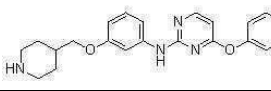
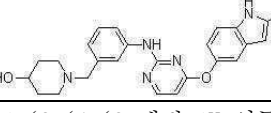
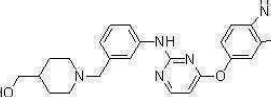
63	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 
65	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((1-(메틸술포닐)피페리딘-4-일)메톡시)페닐)피리미딘-2,4-디아민 
66	1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-올 
67	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(메틸술포닐)페닐)피리미딘-2-아민 
68	N-사이클로프로필-2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아세트아미드 
69	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-메틸아크릴아미드 
70	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N,N-디메틸프로판아미드 
71	N-메틸-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 
72	N2-(2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 

73	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 
77	N2-(3,4-디메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
78	N2-(4-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
79	N2-(2,4-디플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
80	N2-(3-클로로-2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
81	N2-(1H-인돌-4-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
82	N2-(4-(3-(디메틸아미노)프로폭시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
83	2-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 

84	N2-(3-클로로-4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
86	(1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 
87	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-(4-(메틸술폰포닐)피페라진-1-일)에톡시)페닐)피리미딘-2,4-디아민 
89	N2-(2-클로로-4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
90	2-클로로-4-플루오로-5-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 
91	N2-(4-클로로-2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
92	N2-(3-(2-(디메틸아미노)에톡시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
93	N2-(2-메틸-1H-인돌-5-일)-N4-(3-(3-(메틸술폰프로폭시)페닐)피리미딘-2,4-디아민 
94	2-(1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 
95	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-4-일메톡시)페닐)피리미딘-2,4-디아민 
97	1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-올 

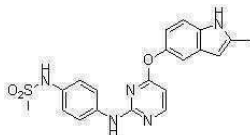
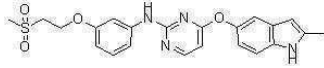
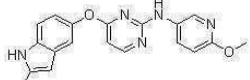

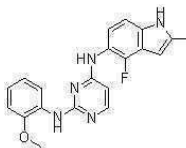
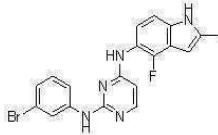
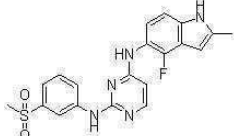
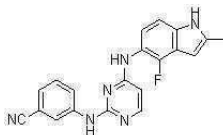
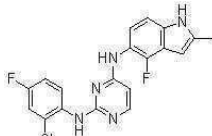
101	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-(4-(메틸술폰닐)피페라진-1-일)프로폭시)페닐)피리미딘-2,4-디아민 
102	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-모르폴리노프로폭시)페닐)피리미딘-2,4-디아민 
104	(E)-N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아크릴아미드 
105	4-(4-플루오로-2-메틸-1H-인돌-5-일)-N-(3-(3-(티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 
106	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2,4-디아민 
107	4-(4-(플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(티오모르폴리노-1'-옥사이드)프로폭시)페닐)피리미딘-2-아민 
108	N-(2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 
109	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2,4-디아민 
111	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
112	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-피롤리딘에톡시)페닐)피리미딘-2,4-디아민 

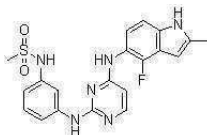
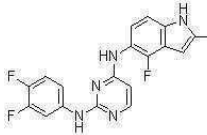
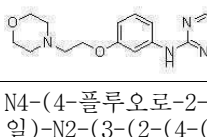
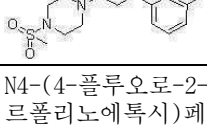
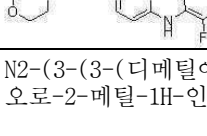
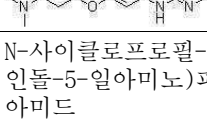
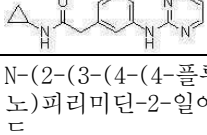
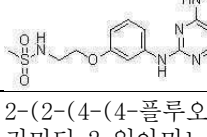
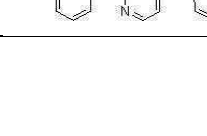
115	N4-(2-메틸-1H-인돌-5-일)-N2-(3-((4-(메틸술폰닐)피페라진-1-일)메틸)페닐)피리미딘-2,4-디아민 
116	2-(4-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 
117	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(메틸술폰닐메틸)페닐)피리미딘-2,4-디아민 
118	N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)프로판아미드 
119	(E)-N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아크릴아미드 
121	N2-(3-(2-아미노에톡시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
122	N-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)메탄술폰아미드 
124	N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)프로판아미드 
130	N-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 
132	N2-(6-메톡시피리딘-3-일)-N4-(2-메틸-1H-인돌-5-일)피리딘-2,4-디아민 

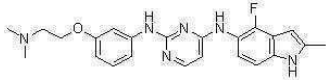
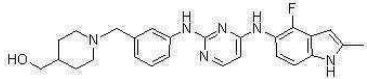
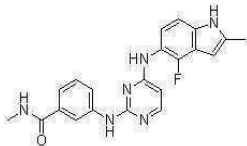
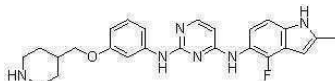
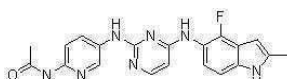
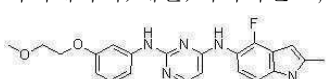
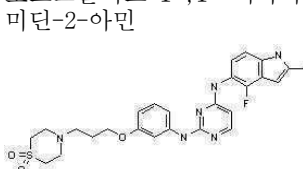
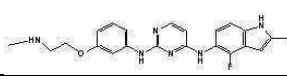
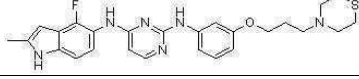
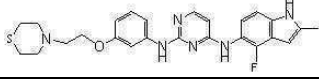
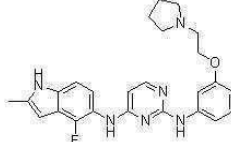
133	2-메틸-N-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일)-1H-인돌-5-아민 
134	N-(3-(3-(디메틸아미노)프로폭시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
135	2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에탄올 
136	N-(3-(2-(디메틸아미노)에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
137	N-사이클로프로필-2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아세트아미드 
138	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(메틸술포닐)프로폭시)페닐)피리미딘-2-아민 
139	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(피페리딘-4-일메톡시)페닐)피리미딘-2-아민 
143	1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-올 
144	(1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 

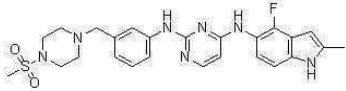
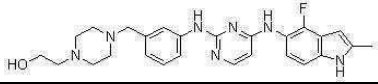
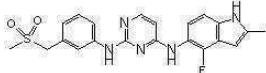
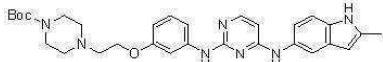
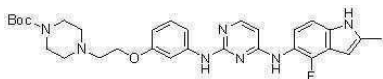
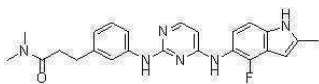
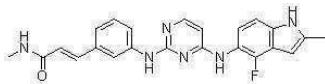
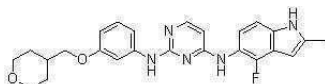
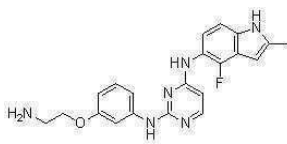
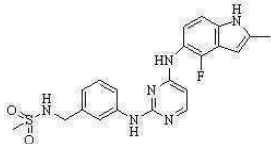
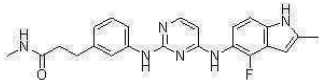
145	2-(1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올	
146	N-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드	
148	(E)-N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아크릴아미드	
150	N-(3-(2-메톡시에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민	
152	N-(2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드	
154	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에톡시)페닐)피리미딘-2-아민	
156	N-(3-(2-메톡시에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민	
157	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(모르폴리노메틸)페닐)피리미딘-2-아민	
158	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2-아민	
162	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2-아민	
163	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2-아민	

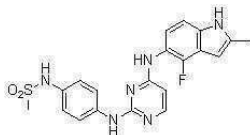
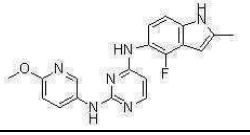
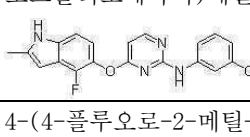
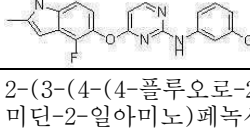
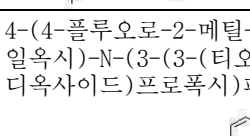
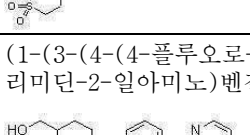
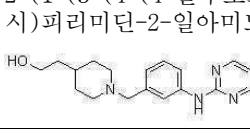
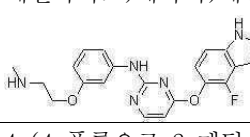
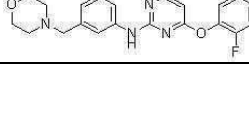

164	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-((4-(메틸술폰닐)피페라진-1-일)메틸)페닐)피리미딘-2-아민	
165	2-(4-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올	
166	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2-아민	
167	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(메틸술폰닐메틸)페닐)피리미딘-2-아민	
168	터트-부틸 4-(2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카복실레이트	
169	N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)프로판아미드	
170	(E)-N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아크릴아미드	
172	N-(3-(2-아미노에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민	
173	N-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)메탄술폰아미드	
175	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피페라진-1-일)에톡시)페닐)피리미딘-2-아민	
179	N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)프로판아미드	

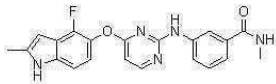
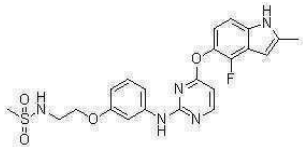
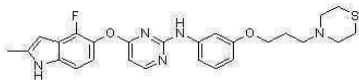
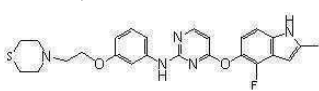
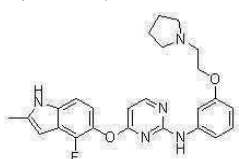
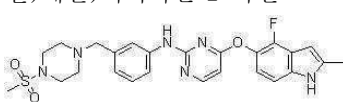
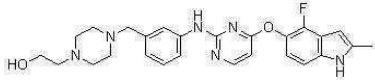
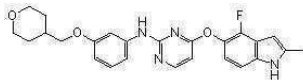
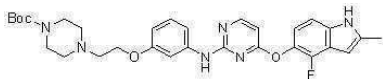
181	N-(4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 
183	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술포닐)에톡시)페닐)피리미딘-2-아민 
185	N-(6-메톡시피리딘-3-일)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
186	메틸 2-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세테이트 
187	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-메톡시페닐)피리미딘-2,4-디아민 
188	N2-(3-브로모페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
189	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(메틸술포닐)페닐)피리미딘-2,4-디아민 
190	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 
191	N2-(2-클로로-4-플루오로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 

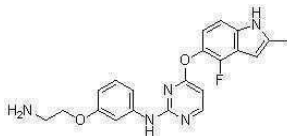
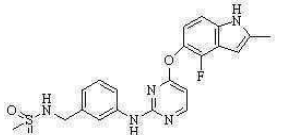
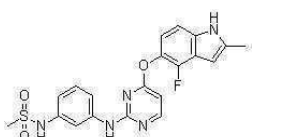
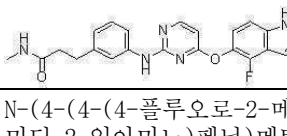
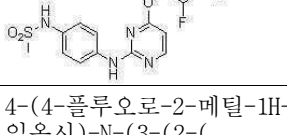
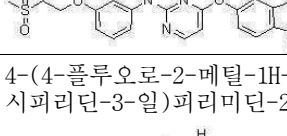
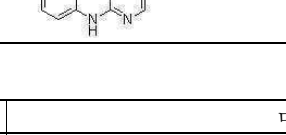
192	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 
193	N2-(3,4-디플루오로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
194	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
195	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(4-(메틸술폰닐)피페라진-1-일)에톡시)페닐)피리미딘-2,4-디아민 
196	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
197	N2-(3-(3-(디메틸아미노)프로폭시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
198	N-사이클로프로필-2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세트아미드 
199	N-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 
200	2-(2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 

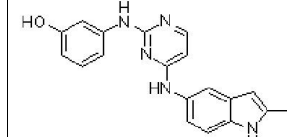
201	N2-(3-(2-(디메틸아미노)에톡시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
202	(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 
203	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-메틸벤즈아미드 
205	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-4-일메톡시)페닐)피리미딘-2,4-디아민 
208	N-(5-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)피리딘-2-일)아세트아미드 
211	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-메톡시에톡시)페닐)피리미딘-2,4-디아민 
212	4-(4-플루오로-2-메틸-1H-인돌-5-일)-N-(3-(3-(티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 
214	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2,4-디아민 
216	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2,4-디아민 
218	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2,4-디아민 
219	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2,4-디아민 

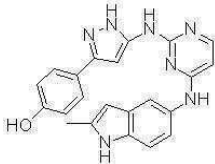

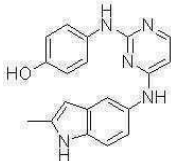
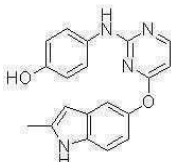
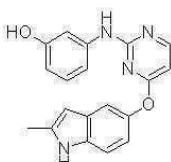



220	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((4-(메틸술포닐)피페라진-1-일)메틸)페닐)피리미딘-2,4-디아민 
221	2-(4-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 
223	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(메틸술포닐메틸)페닐)피리미딘-2,4-디아민 
224	터트-부틸 4-(2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트 
225	터트-부틸 4-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트 
226	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노))페닐)-N,N-디메틸프로판아미드 
227	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-메틸아크릴아미드 
228	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2,4-디아민 
229	N2-(3-(2-아미노에톡시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
230	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)메탄술포나미드 
234	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-메틸프로판아미드 


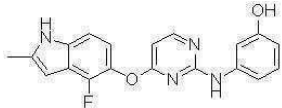
236	N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 
241	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(6-메톡시피리딘-3-일)피리미딘-2,4-디아민 
242	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에톡시)페닐)피리미딘-2-아민 
243	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-모르폴리노프로폭시)페닐)피리미딘-2-아민 
244	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에탄올 
245	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 
251	(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 
252	2-(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 
253	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2-아민 
255	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(모르폴리노메틸)페닐)피리미딘-2-아민 

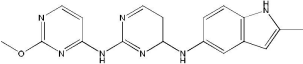
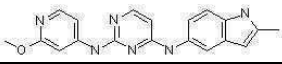
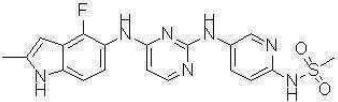
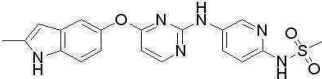
257	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-메틸벤즈아미드 
258	N-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 
260	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2-아민 
263	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2-아민 
264	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2-아민 
265	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-((4-(메틸술폰닐)피페라진-1-일)메틸)페닐)피리미딘-2-아민 
266	2-(4-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 
267	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2-아민 
269	터트-부틸 4-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트 

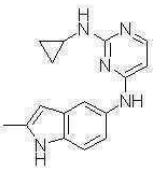
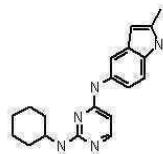
271	N-(3-(2-아미노에톡시)페닐)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 
272	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)메탄술폰아미드 
276	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 
278	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-메틸프로판아미드 
280	N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 
282	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술폰에톡시)페닐)피리미딘-2-아민 
283	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(6-메톡시피리딘-3-일)피리미딘-2-아민 

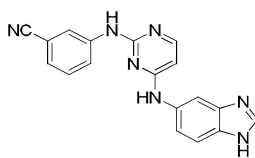
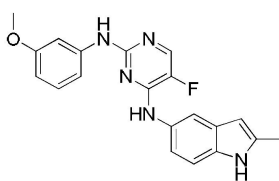
화합물	명칭
284	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 

285	4-(5-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-1H-피라졸-3-일)페놀 
286	2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 
287	4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 
289	4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페놀 
290	3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페놀 
291	2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 
292	4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 
293	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 

294	3-(4-(2-메틸벤조[d]옥사졸-6-일아미노)피리미딘-2-일아미노)페놀 
295	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페놀 

화합물	명칭
296	N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
297	N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
298	N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
299	N-5-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)피리딘-2-일)메탄술폰아미드 

화합물	명칭
302	N2-사이클로프로필-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 
303	N2-사이클로헥실-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 

화합물	명칭
305	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 
309	N2-(3-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 

청구항 5

제1항 내지 제4항 중 어느 한 항의 화합물 또는 이의 약학적으로 허용가능한 염의 유효량을, 혈관신생 관련 질병의 치료를 위한 약제 제조에 사용하는 방법.

청구항 6

제5항에 있어서, 상기 혈관신생 관련 질병은 암 또는 노인성황반변성인 것인 방법.

청구항 7

제1항 내지 제4항 중 어느 한 항의 화합물 또는 이의 약학적으로 허용가능한 염의 유효량을, 대상체 내 혈관신생의 억제를 위한 약제 제조에 사용하는 방법.

청구항 8

혈관신생 관련 질병 치료에 사용하기 위한, 제1항 내지 제4항 중 어느 한 항의 화합물 또는 이의 약학적으로 허용가능한 염.

청구항 9

제8항에 있어서, 상기 혈관신생 관련 질병은 암 또는 노인성황반변성인 것인 화합물 또는 이의 약학적으로 허용가능한 염.

청구항 10

대상체 내 혈관신생 억제에 사용하기 위한, 제1항 내지 제4항 중 어느 한 항의 화합물 또는 이의 약학적으로 허용가능한 염.

청구항 11

제1항 내지 제4항 중 어느 한 항의 화합물 또는 이의 약학적으로 허용가능한 염의 유효량과 키나아제 삼입 도메인 수용체를 접촉시키는 것을 포함하는, 상기 수용체 활성화의 비치료적 억제 방법.

청구항 12

삭제

청구항 13

삭제

청구항 14

삭제

청구항 15

삭제

청구항 16

삭제

청구항 17

삭제

청구항 18

삭제

청구항 19

삭제

청구항 20

삭제

청구항 21

삭제

청구항 22

삭제

청구항 23

삭제

청구항 24

삭제

청구항 25

삭제

발명의 설명

기술 분야

[0001] 본 발명은 키나아제 사입 도메인 수용체의 활성을 억제하는 피리미딘 화합물 및 키나아제 사입 도메인 수용체의 활성을 억제하는 방법에 관한 것이다.

배경 기술

[0002] 본 출원은 2007년 4월 16일에 출원된 미국 가출원 제 60/911,921호의 우선권을 주장한다. 이전 출원의 내용은 그 내용 자체로 본 명세서에 참고로 포함되어 있다.

[0003] 혈관신생은 선제하는(pre-existing) 혈관으로부터 새로운 혈관을 성장시키는 생리학적 과정이다. 이는 건강한 피검자에게서 상처의 치료가 발생하게 된다 즉, 상해 또는 손상을 입은 후에 조직에 혈류를 회복시키는 과정이다.

[0004] 과도한 혈관 성장은 암, 노인성황반변성(age-related macula degeneration), 류마티스성 관절염 및 건선과 같은

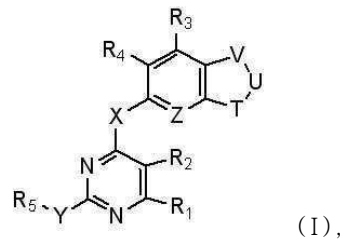
특정 병리적 상태에 의하여 촉발될 수 있다. 그 결과, 신생 혈관은 병든 조직에 영양분을 공급하고 정상 조직을 파괴한다. 또한, 암에서는 신생 혈관으로 인하여 종양 세포가 혈액 순환으로 빠져나가 다른 기관들에서 머무르게 한다.

[0005] 혈관 내피 성장 인자(VEGF), 동종이량체 당단백질(homodimeric glycoprotein) 및 그 수용체들, 예컨대 키나아제 삽입 도메인 수용체(KDR)는 중요한 혈관신생 경로를 구성한다. 연구에 의하면 KDR의 억제로 인하여 상피 세포 세포자살 및 그로 인한 혈관신생의 억제가 발생했음을 보여주었다. Rubin M. Tuder, *Chest*, 2000; 117: 281. 그러므로, KDR 억제제는 혈관신생 관련 질병들의 치료에 잠재적인 후보가 된다.

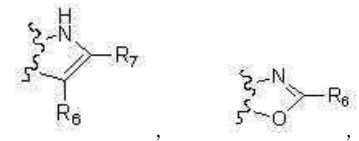
발명의 상세한 설명

[0006] 본 발명은 수많은 피리미딘 화합물들이 KDR의 활성을 억제한다는 발견에 근거한 것이다.

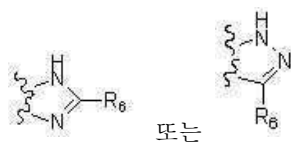
[0007] 본 발명의 일 태양은 하기 식(I)의 피리미딘 화합물들을 특징으로 한다:



[0008] 상기 식에서, X 및 Y의 각각은 독립적으로 O, S 또는 NR이며, R은 H, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알킬카르보닐, 알콕시카르보닐, 아미노카르보닐 또는 아미노술포닐이다; Z는 CR' 또는 N이며, R'은 H, 할로, 니트로, 시아노, 히드록실, 알콕시, 아릴옥시, 알킬, 알케닐, 알키닐,

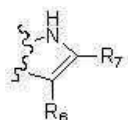


아릴, 사이클로알킬 또는 헤테로사이클로알킬이다; V, U 및 T는 함께



를 나타낸다; R₁, R₂, R₃, R₄ 및 R₆ 각각은 독립적으로 H, 할로, 니트로, 아미노, 시아노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 카르보닐아미노, 술포닐아미노, 아미노카르보닐 또는 아미노술포닐이다; R₅는 알킬, 사이클로알킬, 헤테로사이클로알킬, 아릴 또는 헤테로아릴이다; 그리고 R₇은 알킬이다.

[0010] 식(I)을 참조하면, 상기 화합물들의 일 서브셋(subset)은 R₁, R₂, R₃ 및 R₄는 H이며, R₅는 할로, 니트로, 아미노, 시아노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 술포닐, 카르보닐아미노, 술포닐아미노, 아미노카르보닐 또는 아미노술포닐이라는 것을 특징으로 한다. 다른 서브셋은 X는 O 또는 NH이다; Y는 NH이다; V, U 및 T는

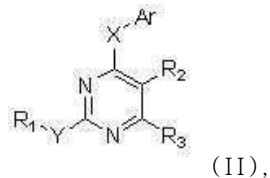


함께 을 나타내며, 상기 식에서 R₆는 H일 수 있으며, R₇은 메틸일 수 있다; 또는 Z는 CR'이며, R'은 H, 할로 또는 알킬이다.

[0011] 본 명세서의 "알킬"이라는 용어는 1 내지 10 개의 탄소 원자들을 포함하는 직쇄 또는 분지쇄 탄화수소를 뜻한다. 알킬기들의 예는 메틸, 에틸, *n*-프로필, *i*-프로필, *n*-부틸, *i*-부틸 및 *t*-부틸을 포함하지만, 여기에 한정되지 않는다. "알콕시"라는 용어는 -O-알킬을 뜻한다.

[0012] "아릴"이라는 용어는 6-탄소 모노사이클릭, 10-탄소 바이사이클릭, 14-탄소 트리사이클릭 방향족 고리 시스템으로서, 각각의 고리는 1 내지 4 개의 치환체들을 가질 수 있는 시스템을 뜻한다. 알킬기들의 예는 페닐, 나프틸 및 안트라세닐(anthracenyl)을 포함하지만, 여기에 한정되지 않는다.

- [0013] "사이클로알킬"이라는 용어는 3 내지 12 개의 탄소들을 가지는 포화 및 부분적으로 불포화된 사이클릭 탄화수소를 뜻한다. 사이클로알킬기들의 예는 사이클로프로필, 사이클로부틸, 사이클로펜틸, 사이클로헥테닐, 사이클로헥실, 사이클로헥세닐, 사이클로헵틸 및 사이클로옥틸을 포함하지만, 여기에 한정되지 않는다.
- [0014] "헤테로아릴"이라는 용어는 하나 이상의 헤테로원자들(O, N 또는 S)을 갖는 방향족 5 내지 8 원(membered) 모노사이클릭 고리 시스템, 8 내지 12 원 바이사이클릭 고리 시스템 또는 11 내지 14 원 트리사이클릭 고리 시스템을 뜻한다. 헤테로아릴기들의 예는 피리딜, 푸릴(furyl), 이미다졸릴, 벤조이미다졸릴(benzimidazolyl), 피리미디닐, 티에닐, 퀴놀리닐, 인돌릴 및 티아졸릴을 포함한다. "헤테로알킬"이라는 용어는 헤테로아릴기로 치환된 알킬기를 뜻한다.
- [0015] "헤테로사이클로알킬"이라는 용어는 하나 이상의 헤테로원자들(O, N 또는 S)을 갖는 비방향족 5 내지 8 원 모노사이클릭 고리 시스템, 8 내지 12 원 바이사이클릭 고리 시스템 또는 11 내지 14 원 트리사이클릭 고리 시스템을 뜻한다. 헤테로사이클로알킬기들의 예는 피페라지닐, 피롤리디닐, 디옥사닐, 피롤리디닐, 디옥사닐(dioxanyl), 모르폴리닐 및 테트라히드로푸라닐을 포함하지만, 여기에 한정되지 않는다. 헤테로사이클로알킬은 예컨대, 글루코실과 같은 사카라이드 고리일 수 있다.
- [0016] 본 명세서에 언급된 알킬, 사이클로알킬, 헤테로사이클로알킬, 아릴, 헤테로아릴 및 알콕시는 치환된 모이어티(moiety)와 치환되지 않은 모이어티 양쪽 모두를 포함한다. 치환기들의 예는 할로, 히드록실, 아미노, 시아노, 니트로, 메르캅토, 알콕시카르보닐, 아미도, 카르복시, 알칸술포닐, 알킬카르보닐, 카르바미도, 카르바밀, 카르복실, 티오우레이도(thioureido), 티오시아나토(thiocyanato), 술폰아미도, 알킬, 알케닐, 알키닐, 알콕시, 아릴, 헤테로아릴, 사이클로알킬 및 헤테로사이클로알킬이 더 치환될 수 있는 알킬, 알케닐, 알키닐, 알콕시, 아릴, 헤테로아릴, 사이클로알킬, 헤테로사이클로알킬을 포함하지만, 여기에 한정되지 않는다.
- [0017] 상술한 피리미딘 화합물들은 해당되는 경우에 약학적으로 허용가능한 염, 수화물 및 전구약물을 포함한다.
- [0018] 본 발명의 다른 태양은 혈관신생 관련 질환(예컨대, 암 또는 노인성황반변성)의 치료 방법을 특징한다. 상기 방법은 하나 이상의 상술한 피리미딘 화합물들의 유효량을 상기 질환을 갖는 피검자에게 투여하는 단계를 포함한다.
- [0019] 본 발명의 또 다른 태양은 의 활성을 억제하는 방법으로서, 키나아제 삼입 도메인 수용체를 식(II)의 피리미딘 화합물의 유효량과 접촉시켜 키나아제 삼입 도메인 수용체의 활성을 억제하는 방법을 특징한다:



- [0020]
- [0021] 상기 식에서, R_1 은 H, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬 또는 헤테로아릴이다; R_2 및 R_3 각각은 독립적으로 H, 할로젠, 니트로, 아미노, CN, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬카르보닐, 카르복시 또는 알콕시카르보닐이다; X 및 Y 각각은 독립적으로 O, N 또는 NR_4 이며, R_4 는 H, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알킬카르보닐, 알콕시카르보닐, 아미노카르보닐 또는 아미노술포닐이다; 그리고 Ar은 아릴 또는 헤테로아릴이다.
- [0022] 식 (II)를 참조하면, 화합물들의 일 서브셋은 Ar은 인돌릴, 인다졸릴(indazolyl), 벤조이미다졸릴(benzimidazolyl) 또는 벤조옥사졸릴(benzoxazolyl)이며; X는 O 또는 NH 이며 Y는 NH이며; 또는 R_1 은 할로, 니트로, 아미노, 시아노, 히드록시, 알킬, 알케닐, 알키닐, 아릴, 사이클로알킬, 헤테로사이클로알킬, 헤테로아릴, 알콕시, 알킬티오, 알킬카르보닐, 카르복시, 알콕시카르보닐, 술포닐, 카르보닐아미노, 술포닐아미노, 아미노카르보닐 또는 아미노술포닐로 선택적으로 치환된 아릴 또는 헤테로아릴인 것을 특징한다.
- [0023] 화합물 1 내지 317의 예들은 하기 상세한 설명에 도시되어 있다.
- [0024] 본 발명의 또 다른 태양은 상술한 식(II)의 피리미딘 화합물의 유효량을 이를 필요로 하는 피검자에게 투여하여 혈관신생을 억제하거나 노인성황반변성을 치료하는 방법을 특징한다.

[0025] 또한, (1) 혈관신생 관련 질환(예컨대, 암 또는 노인성황반변성과 같은 질환) 치료용으로 상술한 하나 이상의 피리미딘 화합물들 및 약학적으로 허용가능한 담체를 포함하는 조성물 및 (2) 상기 질환 치료용의 약제 제조를 위한 하나 이상의 피리미딘 화합물들의 용도는 본 발명의 범위 내에 있다.

[0026] 본 발명의 하나 이상의 실시예들의 상세한 사항은 하기 설명에 설명되어 있다. 본 발명의 다른 특징, 목적 및 장점은 상세한 설명 및 청구항에서 명백해질 것이다.

실시예

[0027] 상술한 화합물들은 상용 구입가능한 시작 물질들로부터 업계에 공지된 방법에 의하여 합성될 수 있다. 일례로, 적당한 피리미딘 화합물의 활성 N2-위치 및 N4-위치의 이탈기들(예컨대, 염화물, *p*-TsO, MeS 또는 MeSO₂)을 예컨대, 부흐발드-하트위그(Buchwald-Hartwig) 짝지음 반응을 통하여 아미노 또는 히드록실과 같은 친핵단들로 치환할 수 있다. 상기 치환은 우선 상기 N2 위치 또는 N4 위치 중 어느 하나에서 이루어질 수 있다.

[0028] 상기에 얻어진 화합물들은 그 주변 위치들에서 더 변형되어 원하는 화합물들을 제공할 수 있다.

[0029] 바람직한 피리미딘 화합물들을 합성하는데 유용한 합성 화학 변형은 예를 들면, R. Larock, *Comprehensive Organic Transformations*, VCH Publishers (1989); T.W. Greene and P.G.M. Wuts, *Protective Groups in Organic Synthesis*, 3rd Ed., John Wiley and Sons (1999); L. Fieser and M. Fieser, *Fieser and Fieser's Reagents for Organic Synthesis*, John Wiley and Sons (1994); and L. Paquette, ed., *Encyclopedia of Reagents for Organic Synthesis*, John Wiley and Sons (1995) 및 그 후속판들에 기술되어 있다.

[0030] 본 화합물들은 사용전에 칼럼 크로마토그래피, 고성능 액체 크로마토그래피, 결정화 또는 다른 적당한 방법에 의하여 정제될 수 있다.

[0031] 상술한 피리미딘 화합물들은 KDR과 접촉할 경우 수용체의 활성을 억제한다. 그러므로, 하나 이상의 상기 화합물들의 유효량은 혈관신생을 억제하고 혈관신생 관련 질환을 가진 피검자를 치료하는데 사용될 수 있다.

[0032] "유효량"이라는 용어는 피검자에게 의도된 효과를 부여하는데 필요한 피리미딘 화합물의 양을 뜻한다. 당업자가 인식하는 바와 같이, 유효량은 투여 경로, 부형제 사용 및 다른 작용제들과의 공동 사용 가능성에 의존하여 변할 수 있다. "치료하는"이라는 용어는 하나 이상의 상술한 피리미딘 화합물들을 혈관신생 관련 질환을 가지거나 상기 질환의 징후를 가지거나 상기 질환에 대한 소인을 가진 피검자에게 상기 질환, 상기 질환의 징후 또는 상기 질환에 대한 소인을 치료, 치유, 경감, 감소, 구제, 변경, 교정, 개량, 개선 또는 영향을 줄 목적으로 투여하는 것을 뜻한다.

[0033] 본 방법을 수행하기 위하여, 하나 이상의 본 발명의 피리미딘 화합물을 경구, 비경구, 흡입 스프레이에 의하여 또는 이식된 저수통(implanted reservoir)을 통하여 투여될 수 있다. 본 명세서에 사용된 "비경구"라는 용어는 피하, 피내, 정맥내, 근육내, 관절내, 동맥내, 활액낭내(intrasynovial), 흉골내, 척수강내, 병소내(intralesional) 및 두개골내 주사 또는 주입 기술들을 포함한다.

[0034] 경구 조성물은 정제, 캡슐, 에멀전 및 수용성 현탁액, 분산액 및 용액을 포함하지만, 여기에 한정되지 않는 임의의 경구로 허용가능한 투여 형태일 수 있다. 정제로 흔히 사용되는 담체는 유당 및 옥수수 전분을 포함한다. 또한, 스테아린산마그네슘과 같은 윤활제는 일반적으로 정제에 첨가된다. 캡슐 형태의 경구 투여용으로 유용한 희석제는 유당 및 건조 옥수수 전분을 포함한다. 수용성 분산액 또는 에멀전이 경구로 투여되는 경우에, 활성 성분은 유화제 또는 현탁화제와 혼합된 유상에서 분산되거나 용해될 수 있다. 원한다면, 특정한 감미제, 향미료 또는 착색제가 첨가될 수 있다.

[0035] 멸균 주사용 조성물(예컨대, 수용성 또는 유성 분산액)은 적당한 분산제 또는 습윤제(예를 들면 Tween 80과 같은) 및 현탁화제를 사용한 업계에 공지된 기술에 따라 제형될 수 있다. 또한, 상기 멸균 주사용 제제는 예를 들면, 1,3-부탄디올에 용해된 용액과 같이 비독성의 비경구적으로 허용가능한 희석제 또는 용액에 용해된 멸균 주사용 용액 또는 현탁액일 수 있다. 이에 차용될 수 있는 허용가능한 운반체 및 용매 중에는 만니톨, 물, 링거 용액 및 등장성 염화나트륨 용액이 있다. 또한, 멸균 고정유가 용매 또는 현탁 매질(예컨대, 합성 모노글리세라이드 또는 디글리세라이드)로서 종래 차용된다. 올레산 및 그 글리세라이드 유도체와 같은 지방산은 올리브유 또는 피마자유와 같은 천연 약학적 허용가능한 오일로서 이의 폴리옥시에틸레이트화된 형태의 주사용 제제의 제조에 유용하다. 또한, 이러한 유성 용액 또는 현탁액은 장쇄 알코올 희석제 또는 분산제 또는 카르복시메틸 셀룰로오스 또는 유사한 분산제를 포함할 수 있다.

[0036] 흡입용 조성물은 약학 제형의 업계에 공지된 기술에 따라 제조될 수 있으며, 벤질 알코올 또는 다른 적당한 보존제, 생체이용도를 향상시킬 흡수 촉진제(absorption promoter), 탄화플루오린 및/또는 업계에 공지된 다른 가용화제 또는 분산제를 사용하여 식염수에 용해된 용액으로 제조될 수 있다.

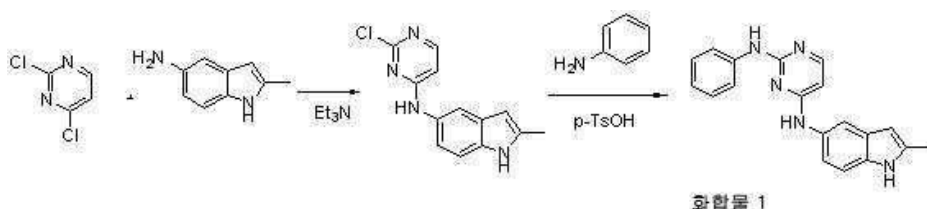
[0037] 국소 조성물은 오일, 크림, 로션, 연고 등의 형태로 제형될 수 있다. 상기 조성물용으로 적당한 담체는 식물성 기름 또는 광물유, 백색바셀린(백색 부드러운 파라핀), 분지쇄 지방 또는 오일, 동물성 지방 및 고분자량 알코올류(C12 초과)의 형태로 제형될 수 있다. 바람직한 담체는 활성 성분이 가용성인 담체이다. 또한, 필요하다면 색채 또는 방향을 부여하는 작용제뿐만 아니라 유화제, 안정화제, 보습제 및 항산화제가 포함될 수 있다. 또한, 경피 침투 강화제가 이러한 국소 제형에 차용될 수 있다. 상기 강화제들의 예는 미국 특허 제 3,989,816호 및 4,444,762호에서 찾을 수 있다. 바람직하게는, 크림은 광물유, 자가-유화 밀랍 및 물의 혼합물로부터 제형되며, 상기 혼합물에서 소량의 아몬드유와 같은 기름에 용해된 활성 성분이 첨가혼합되어 있다. 상기 크림의 일 예는 약 40 중량부의 물, 약 20 중량부의 밀랍, 약 40 중량부의 광물유 및 약 1 중량부의 아몬드유를 포함하는 크림이다. 연고는 아몬드유와 같은 식물성 기름에 활성 성분을 용해시킨 용액을 따뜻한 부드러운 파라핀과 혼합하고 이 혼합물을 냉각시켜 제형될 수 있다. 상기 연고의 일 예는 중량비 약 30%의 아몬드 및 중량비 약 70%의 백색 부드러운 파라핀을 포함하는 연고이다.

[0038] 약학적 조성물에서의 담체는 제형의 활성성분들과 융합가능하며(그리고 바람직하게는, 담체를 안정화시킬 수 있으며) 그리고 치료받는 피검자에게 해롭지 않다는 의미에서 "허용가능"하여야 한다. 예를 들면, (추출물의 하나 이상의 활성 피리미딘 화합물들과 특이적이며 더 가용성 복합체들을 형성하는) 시클로텍스트린과 같은 가용화제가 활성 성분의 전달을 위한 약학적 부형제로서 활용될 수 있다. 다른 담체들의 예는 콜로이드성 이산화규소, 스테아린산 마그네슘, 셀룰로오스, 라우릴 황산 나트륨 및 D&C Yellow # 10을 포함한다.

[0039] 적당한 체외 검사를 이용하여 KDR의 활성을 억제하거나 VEGF의 활성을 억제하는 상술한 피리미딘 화합물들의 효능을 예비 평가할 수 있다. 상기 화합물들은 체내 검사에 의하여 혈관신생과 관련 질환의 치료에 그 효능에 대하여 더 검사될 수 있다. 예를 들면, 상기 화합물들은 암을 지닌 동물(예컨대, 쥐 모델)에 투여될 수 있으며, 이후 그 치료 효과를 평가한다. 또한, 그 결과를 바탕으로 적당한 투여량 범위 및 투여 경로가 결정될 수 있다.

[0040] 더 상세하게 설명하지 않고, 상기 설명은 본 발명을 적절히 가능하게 하였다고 믿어진다. 그러므로, 하기 특이적인 실시예들은 예시적으로만 해석되어야 하며, 본 개시물의 나머지 부분을 임의의 방식으로 한정하여서는 안 된다.

[0041] 실시예 1: N4-(2-메틸-1H-인돌-5-일)-N2-페닐피리미딘-2,4-디아민(화합물 1)의 합성



[0042]

[0043] Et₃N (1 mmol)은 2,4-디클로로피리미딘(1 mmol) 및 5-아미노-2-메틸인돌(1 mmol)을 EtOH 5 mL에 용해시킨 용액에 첨가되었다. 반응 혼합물은 5 시간 동안 환류되었다. 진공 상태에서 용매를 제거하고 H₂O를 첨가한 후에, 상기 혼합물은 EtOAc로 추출되었다. 유기층들은 혼합되며, 포화 NaCl 용액으로 세척되며, 무수 Na₂SO₄ 상에서 건조된 후 진공 상태에서 농축되었다. 그 결과 남은 잔류물은 칼럼 크로마토그래피로 정제시켜 80% 수율의 N-(2-클로로로피리미딘-4-일)-2-메틸-1H-인돌-5-아민(0.1 mmol)을 얻었다.

[0044] N-(2-클로로로피리미딘-4-일)-2-메틸-1H-인돌-5-아민(0.1 mmol) 및 아닐린(0.1 mmol)은 DMF 0.5 mL에 용해되었다. 여기에 p-TsOH 모노하이드레이트(0.2 mmol)이 첨가되었다. 반응 혼합물은 60°C에서 5 시간 동안 교반되고, 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 그 결과 남은 잔류물은 칼럼 크로마토그래피로 정제시켜 85% 수율의 생성물을 얻게 되었다.

[0045] ¹H NMR (CD₃OD, 400 MHz): d 7.831 (d, J=6.0Hz, 1H), 7.633 (t, J=8.0-7.6Hz, 3H), 7.262 (t, J=8.4-7.6 Hz,

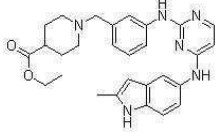
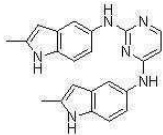
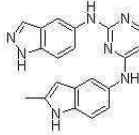
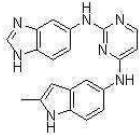
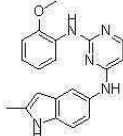
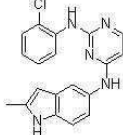
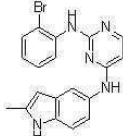
3H), 7.064 (d, $J=6.8$ Hz, 1H), 6.995 ((t, $J=7.6-7.2$ Hz, 1H), 6.133 (t, $J=6.4-2.0$ Hz, 2H), 2.439 (s, 3H); MS (m/e): 384.2 (M+1).

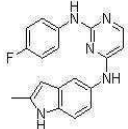
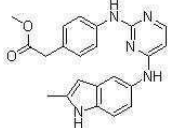
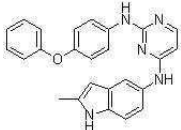
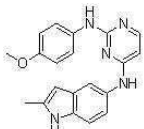
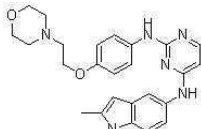

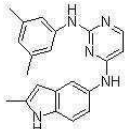
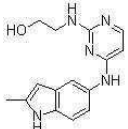
[0046] 실시예 2 내지 283: 화합물 2 내지 283의 합성

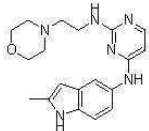
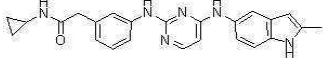
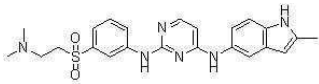
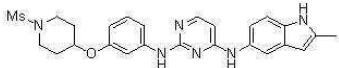
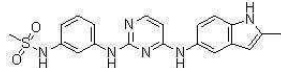
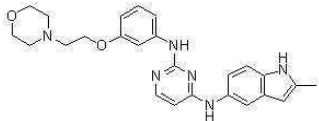
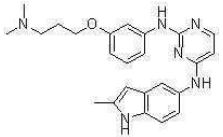
[0047] 화합물 2 내지 283은 각각 실시예 1에 기술된 것과 유사한 방식으로 합성되었다.

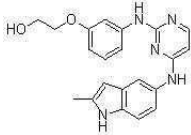
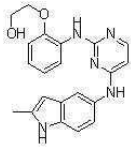
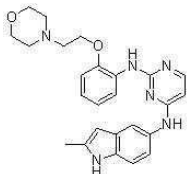
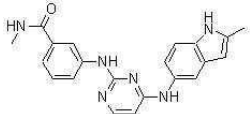
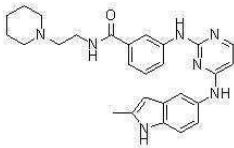
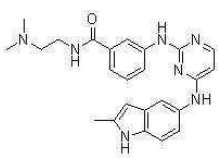
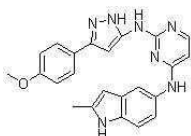
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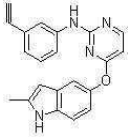
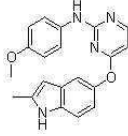
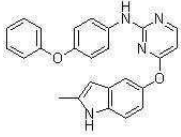
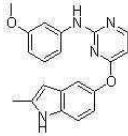
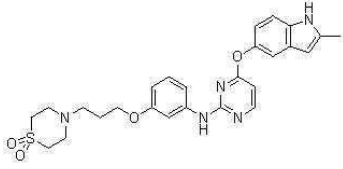
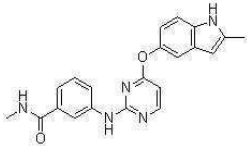
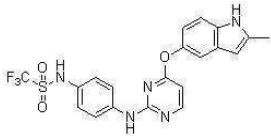
화합물	명칭/구조	^1H NMR (400 MHz, d ppm) / MS
2	N2-(3-에틸닐페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 7.848 (d, $J=6.8$ Hz, 1H), 7.730 (s, 1H), 7.704 (d, $J=8.0$ Hz, 1H), 7.507 (s, 1H), 7.275 (d, $J=8.0$ Hz, 1H), 7.200 (t, $J=8.0$ Hz, 1H), 7.093-7.036 (m, 2H), 6.639 (m, 2H), 2.425 (s, 3H); MS (m/e): 340.4 (M+1)
3	N2-(3-브로모페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 7.879 (s, 1H), 7.784 (d, $J=6.0$ Hz, 1H), 7.437 (br, 1H), 7.373 (s, 1H), 7.255 (d, $J=8.8$ Hz, 1H), 7.079 (br, 2H), 6.968 (d, $J=8.4$ Hz, 1H), 6.133 (s, 1H), 6.041 (d, $J=6.4$ Hz, 1H), 2.400 (s, 3H); MS(m/e): 394.3 (M)
4	N2-(3-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 7.923 (s, 1H), 7.759 (d, $J=6.0$ Hz, 1H), 7.641 (d, $J=8.0$ Hz, 1H), 7.397 (s, 1H), 7.247 (d, $J=8.4$ Hz, 1H), 7.179-7.053 (m, 1H), 6.963 (d, $J=8.4$ Hz, 1H), 6.575 (t, $J=8.0$ Hz, 1H), 6.125 (s, 1H), 6.044 (d, $J=6.0$ Hz, 1H), 2.395 (s, 3H); MS(m/e): 334.2 (M+1)
5	N2-(3-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 7.838 (d, $J=6.8$ Hz, 1H), 7.746 (s, 1H), 7.526 (br, 2H), 7.298 (d, $J=8.4$ Hz, 1H), 7.212 (t, $J=8.0$ Hz, 1H), 7.102 (d, $J=8.4$ Hz, 1H), 7.001 (d, $J=8.0$ Hz, 1H), 6.217 (d, $J=6.0$ Hz, 1H), 6.133 (s, 1H), 2.436 (s, 3H); MS(m/e): 350.2 (M+1)
6	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(트리플루오로메틸)페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 8.045 (d, $J=7.2$ Hz, 1H), 7.788 (d, $J=6.0$ Hz, 2H), 7.529 (s, 1H), 7.366 (d, $J=6.8$ Hz, 1H), 7.276 (d, $J=8.4$ Hz, 1H), 7.228 (d, $J=7.2$ Hz, 1H), 7.083 (d, $J=1.2$ Hz, 1H), 6.190 (d, $J=6.4$ Hz, 1H), 6.115 (s, 1H), 2.440 (s, 3H). MS(m/e): 384.2 (M+1)
7	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(메틸술포닐)페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 11.471 (s, 1H), 9.461 (s, 1H), 9.364 (s, 1H), 8.441 (s, 1H), 8.236 (s, 1H), 7.988 (d, $J=5.6$ Hz, 1H), 7.396 (m, 5H), 7.303 (d, $J=8.4$ Hz, 1H), 6.255 (d, $J=5.6$ Hz, 1H), 3.111 (s, 3H), 2.456 (s, 3H). MS(m/e): 393.2 (M+1)
8	N2-(3-메톡실페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 8.050 (s, 1H), 7.943 (d, $J=6.0$ Hz, 1H), 7.440-7.362 (m, 3H), 7.293 (s, 1H), 7.223 (t, $J=8.0$ Hz, 2H), 7.122 (d, $J=7.6$ Hz, 1H), 7.0211 (d, $J=6.8$ Hz, 1H), 6.808 (s, 1H), 6.680 (d, $J=6.4$ Hz, 1H), 6.222 (s, 1H), 6.068 (d, $J=5.6$ Hz, 1H), 3.790 (s, 3H), 2.472 (s, 3H); MS(m/e): 345.9 (M+1)

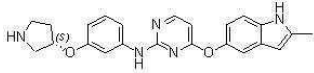
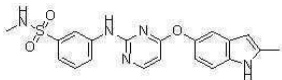
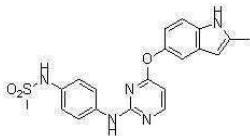
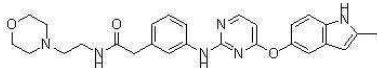
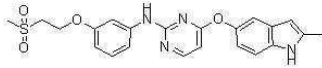
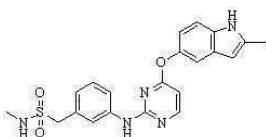


9	에틸 1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-카르복실레이트 	(CD ₃ OD): 8.019(s, 1H), 7.889(d, <i>J</i> =5.6 Hz, 1H), 7.554(s, 1H), 7.399(d, <i>J</i> =8.0 Hz, 1H), 7.328(d, <i>J</i> =8.4 Hz, 1H), 7.278(t, <i>J</i> =8.0 Hz, 1H), 7.101(d, <i>J</i> =8.0 Hz, 1H), 7.002(d, <i>J</i> =7.2 Hz, 1H), 6.180(d, <i>J</i> =6.0 Hz, 1H), 6.141 (s, 1H), 4.166(q, <i>J</i> =7.2 Hz, 1H), 3.586(s, 2H), 2.973-2.943(m, 2H), 2.462(s, 3H), 2.316(br, 1H), 2.089(m, 2H), 1.939-1.885(m, 2H), 1.741-1.653(m, 2H), 1.272(t, <i>J</i> =7.2Hz, 2H); MS(<i>m/e</i>): 485.4 (M+1)
10	N2,N4-비스(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 7.675(d, <i>J</i> =6.4 Hz, 1H), 7.625(s, 1H), 7.577(br, 1H), 7.266-7.219 (m, 2H), 7.068-7.051 (m, 1H), 6.116 (d, <i>J</i> =6.0 Hz, 1H), 6.072 (s, 1H), 6.014 (s, 1H), 2.435 (s, 3H), 2.425 (s, 3H); MS(<i>m/e</i>): 369.3 (M+1)
11	N2-(1H-인다졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 12.385(s, 1H), 10.928(s, 1H), 9.120(s, 1H), 9.003(s, 1H), 8.259(s, 1H), 7.920(d, <i>J</i> =6.0 Hz, 1H), 7.758(s, 1H), 7.667(s, 1H), 7.541 (d, <i>J</i> =8.8 Hz, 2H), 7.399 (d, <i>J</i> =8.8 Hz, 1H), 7.242 (d, <i>J</i> =8.8 Hz, 1H), 7.151(d, <i>J</i> =8.8 Hz, 1H), 6.142 (d, <i>J</i> =6.0 Hz, 1H), 6.017 (s, 1H), 2.389 (s, 3H). MS(<i>m/e</i>): 356.3 (M+1)
12	N2-(1H-벤조[d]이미다졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 10.853(s, 1H), 9.033(s, 1H), 8.956(s, 1H), 8.077(br, 2H), 7.925(d, <i>J</i> =6.0 Hz, 1H), 7.736(s, 1H), 7.533(d, <i>J</i> =8.0 Hz, 1H), 7.444(d, <i>J</i> =8.8 Hz, 1H), 7.214-7.144(m, 2H), 6.131(d, <i>J</i> =6.0 Hz, 1H), 6.020 (s, 1H), 2.372(s, 3H); MS(<i>m/e</i>): 356.3 (M+1)
13	N2-(2-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 8.496(s, 1H), 8.002(d, <i>J</i> =6.0 Hz, 2H), 7.446(s, 1H), 7.047 (dd, <i>J</i> =8.8 Hz, <i>J</i> =2.4 Hz, 1H), 6.981-6.957 (m, 2H), 6.913-6.771 (m, 1H), 6.889 (s, 1H), 6.243 (s, 1H), 6.083(d, <i>J</i> =6.0Hz, 1H), 3.910(s, 3H), 2.490 (s, 3H). MS(<i>m/e</i>): 346.2 (M+1)
14	N2-(2-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 8.385(d, <i>J</i> =6.0 Hz, 1H), 7.914(s, 1H), 7.849(s, 1H), 7.325 (d, <i>J</i> =7.6 Hz, 1H), 7.237 (d, <i>J</i> =8.4 Hz, 1H), 7.182(t, <i>J</i> =7.6 Hz, 1H), 6.945-6.870(m, 2H), 6.119(s, 1H), 6.070(d, <i>J</i> =6.0 Hz, 1H), 2.397 (s, 3H); MS(<i>m/e</i>): 350.1 (M+1)
15	N2-(2-브로모페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 10.860(s, 1H), 9.204(s, 1H), 8.140 (d, <i>J</i> =8.4 Hz, 1H), 7.916 (d, <i>J</i> =5.6 Hz, 2H), 7.651 (d, <i>J</i> =7.6 Hz, 2H), 7.334 (t, <i>J</i> =7.6 Hz, 1H), 7.184 (d, <i>J</i> =8.8 Hz, 1H), 7.038 (br, 2H), 6.192 (d, <i>J</i> =6.0 Hz, 1H), 6.012 (s, 1H), 2.369 (s, 3H); MS(<i>m/e</i>): 394.3 (M)

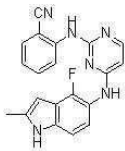
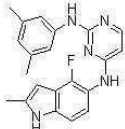

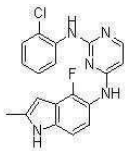
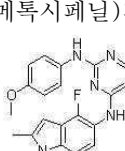
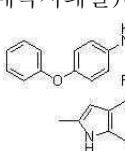
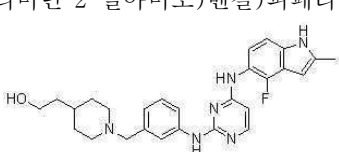
16	N2-(4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 10.889(s, 1H), 9.256 (s, 1H), 9.245 (s, 1H), 7.966 (d, <i>J</i> =5.6 Hz, 1H), 7.752 (m, <i>J</i> =8.4-3.6Hz, 2H), 7.236(d, <i>J</i> =5.4 Hz 1H), 7.133(m, <i>J</i> =8.4-3.6 Hz, 3H), 6.086 (d, <i>J</i> =5.6 Hz, 1H), 6.050(s, 1H), 2.402 (s, 3H); MS(<i>m/e</i>): 334.2 (M+1)
17	메틸 2-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세테이트 	(CD ₃ OD): 10.907(s, 1H), 9.132(s, 1H), 9.015(s, 1H), 7.914(s, 1H), 7.713(d, <i>J</i> =6Hz, 1H), 7.498(d, <i>J</i> =6.8Hz, 1H), 7.217(d, <i>J</i> =7.2Hz, 1H), 7.127(m, 4H), 6.149(d, <i>J</i> =6Hz, 1H), 6.067(s, 1H), 2.384(s, 3H), 2.272(s, 3H), 1.288(s, 2H). MS(<i>m/e</i>): 387.2 (M+1)
18	N4-(2-메틸-1H-인돌-5-일)-N2-(4-페녹시페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 10.855(s, 1H), 9.098(s, 1H), 9.065(s, 1H), 7.909(d, <i>J</i> =5.6Hz, 1H), 7.786(d, <i>J</i> =8Hz, 2H), 7.365(t, <i>J</i> =7.6Hz, 2H), 7.346(s, 1H), 7.201(d, <i>J</i> =8.8Hz, 1H), 7.086(m, 2H), 6.962(d, 8Hz, 2H), 6.895(d, <i>J</i> =8Hz, 2H), 6.137(d, <i>J</i> =5.6Hz, 1H), 6.021(s, 1H), 2.331(s, 3H). MS(<i>m/e</i>): 407.5 (M+1)
19	N2-(4-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 11.097(s, 1H), 9.479(s, 1H), 9.243(s, 1H), 8.090(d, <i>J</i> =6Hz, 1H), 7.923(s, 1H), 7.822(m, 2H), 7.420(d, 8.8Hz, 1H), 7.307(s, 1H), 7.025(d, <i>J</i> =8.8Hz, 2H), 6.340(m, 1H), 6.265(s, 1H), 3.941(s, 3H), 2.591(s, 3H); MS(<i>m/e</i>): 345.4 (M+1)
20	N4-(2-메틸-1H-인돌-5-일)-N2-(4-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 10.899(s, 1H), 9.074(s, 1H), 8.823(s, 1H), 7.869(d, <i>J</i> =6Hz, 1H), 7.713(s, 1H), 7.621(d, <i>J</i> =8.8Hz, 2H), 7.200(d, <i>J</i> =8.4Hz, 1H), 7.080(s, 1H), 6.784(m, 2H), 6.101(d, <i>J</i> =5.6Hz, 1H), 6.025(s, 1H), 4.034(t, <i>J</i> =5.6Hz, 2H), 3.585(t, <i>J</i> =4.8Hz, 4H), 2.679(t, <i>J</i> =5.6Hz, 2H), 2.475(t, <i>J</i> =6.4Hz, 4H), 2.375(s, 3H); MS: 444.5 (M+1)
21	N2-(3,4-디플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 11.234(s, 1H), 9.886 (s, 1H), 9.754 (s, 1H), 7.966 (d, <i>J</i> =5.6 Hz, 2H), 7.752 (s, 1H), 7.393(m, <i>J</i> =8.4-3.6 Hz, 3H), 7.133(d, <i>J</i> =5.6 Hz, 1H), 6.251 (d, <i>J</i> =4.5 Hz, 1H), 6.1.9(s, 1H), 2.402 (s, 3H); MS(<i>m/e</i>): 352.2 (M+1)
22	N2-(3,5-디메틸페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 10.863(s, 1H), 9.051(s, 1H), 8.841(s, 1H), 7.905(d, <i>J</i> =6Hz, 1H), 7.633(s, 1H), 7.361(s, 1H), 7.207(m 2H), 6.507(s, 1H), 6.118(d, <i>J</i> =5.6Hz, 1H), 6.032(s, 2H), 2.370(s, 3H), 2.171(s, 6H); MS(<i>m/e</i>): 343.4 (M+1).
23	2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)에탄올 	(CD ₃ OD): 7.939(d, <i>J</i> =8.0Hz, 1H), 6.923 (d, <i>J</i> =6.8Hz, 2H), 6.437 (s, 1H), 6.328 (d, <i>J</i> =7.6 Hz, 2H), 6.218 (s, 1H), 6.231(d, <i>J</i> =5.6 Hz, 1H), 5.726(d, <i>J</i> =7.2 Hz, 1H), 3.735(t, <i>J</i> =7.2-6.4Hz, 3H), 3.225(t, <i>J</i> =6.8-5.6Hz, 3H), 2.247 (s, 3H); MS(<i>m/e</i>): 384.1(M+1)

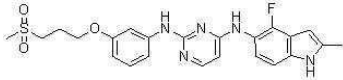
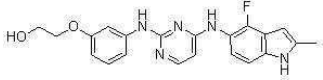
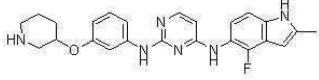
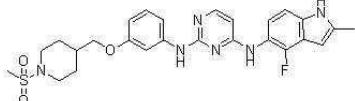
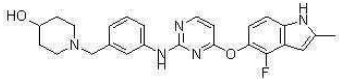
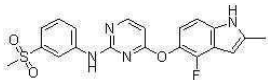
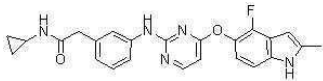
24	N4-(2-메틸-1H-인돌-5-일)-N2-(2-모르폴리노에틸)피리미딘-2,4-디아민 	(CD ₃ OD): 7.796 (d, <i>J</i> =6.0Hz, 1H), 7.497 (s, 1H), 7.246 (d, <i>J</i> =8.8 Hz, 1H), 7.076 (d, <i>J</i> =2.8 Hz, 1H), 6.148(s, 1H), 5.625(d, <i>J</i> =4.8 Hz, 1H), 3.760(m, <i>J</i> =3.2-2.8 Hz, 4H), 3.165(t, <i>J</i> =3.2-2.4, 2H), 2.619(t, <i>J</i> =2.0-0.8Hz, 2H), 2.447(m, <i>J</i> =2.0-1.2Hz, 4H), 2.317(s, 3H). MS(<i>m/e</i>): 353.2(M+1)
25	N-사이클로프로필-2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세트아미드 	(DMSO-d ₆ ,): 7.920 (d, <i>J</i> =5.6 Hz, 1H), 7.700 (m, 2H), 7.546 (s, 1H), 7.220 (d, <i>J</i> =8.0 Hz, 1H), 7.120 (m, 2H), 6.778 (d, <i>J</i> =8.0 Hz, 1H), 6.200 (d, <i>J</i> =6.0 Hz, 1H), 6.066 (s, 1H), 3.027 (s, 2H), 2.593 (m, 1H), 2.380 (s, 3H), 0.608 (m, 2H), 0.404 (m, 2H). MS (<i>m/e</i>): 413.5 (M+1).
26	N2-(3-2-(디메틸아미노)에틸술포닐)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 8.237 (s, 1H), 8.042 (d, <i>J</i> =6.8 Hz 1H), 7.867 (d, <i>J</i> =6.0 Hz, 1H), 7.477 (s, 1H), 7.465 (br, 2H), 7.253 (d, <i>J</i> =8.8 Hz, 1H), 7.028(d, <i>J</i> =8.0 Hz 1H), 6.141(d, <i>J</i> =5.6 Hz 1H), 6.088 (s, 1H), 3.230 (t, <i>J</i> =7.6 Hz, 2H), 2.666 (t, <i>J</i> =7.2 Hz, 2H), 2.409 (s, 3H), 2.165 (s, 6H); MS: 451.4 (M+1).
27	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(1-(메틸술포닐)피페리딘-4-일옥시)페닐)피리미딘-2,4-디아민 	(DMSO-d ₆): 10.976 (s, 1 H), 9.240 (s, 1 H), 9.036 (s, 1 H), 7.054-8.014 (m, 7H), 6.401-6.564 (m, 1H), 6.114-6.278 (m, 1H), 6.012-6.073 (m, 1H), 4.224-4.383 (m, 1H), 3.110-3.209 (m, 2H), 2.770-2.886 (m, 2H), 2.370 (s, 3H), 1.806-1.970 (m, 2H), 1.578-1.712 (m, 1H); MS (<i>m/e</i>): 493.5 (M+1)
28	N-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술포나미드 	(CD ₃ OD): 7.856 (d, <i>J</i> =6.0 Hz, 1H), 7.652 (s, 1H), 7.543 (s, 1H), 7.432 (dd, <i>J</i> =8.4 Hz, 1H), 7.271 (d, <i>J</i> =8.4 Hz, 1H), 7.196 (t, <i>J</i> =8.0 Hz, 1H), 6.882 (dd, <i>J</i> =8.0Hz, 2H), 6.130 (d, <i>J</i> =6.0 Hz, 2H), 2.440 (s, 3H), 2.172 (s, 3H); MS (<i>m/e</i>): 409.3 (M+1)
29	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 	(DMSO-d ₆): d10.825 (s, 1H), 9.023 (s, 1H), 8.986 (s, 1H), 7.927 (d, <i>J</i> =5.6Hz, 1H), 7.703 (s, 1H), 7.429 (s, 1H), 7.351 (d, <i>J</i> =2.4Hz, 1H), 7.208 (d, <i>J</i> =8.8Hz, 1H), 7.076 (m, <i>J</i> =8Hz, 2H), 6.469 (dd, <i>J</i> =8, 2.4Hz, 1H), 6.118 (d, <i>J</i> =2Hz, 1H), 6.057 (s, 1H), 3.933 (t, <i>J</i> =5.6Hz, 2H), 3.551 (t, <i>J</i> =4.8Hz, 4H), 2.591 (t, <i>J</i> =5.6Hz, 2H), 2.401(t, <i>J</i> =4.8Hz, 4H), 2.379 (s, 3H); MS (<i>m/e</i>): 444.5 (M+1).
30	N2-(3-(3-(디메틸아미노)프로폭시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 10.836(s, 1H), 9.021(s, 1H), 8.983(s, 1H), 7.926(d, <i>J</i> =6Hz, 1H), 7.691(s, 1H), 7.419(s, 1H), 7.345(d, <i>J</i> =8.4Hz, 1H), 7.212(d, <i>J</i> =8.4Hz, 1H), 7.079(m, 2H), 6.444(dd, <i>J</i> =8, 2.4Hz, 1H), 6.118(d, <i>J</i> =6Hz, 1H), 6.062(s, 1H), 3.835(t, <i>J</i> =6Hz, 2H), 2.317(s, 3H), 2.318(t, <i>J</i> =7.2Hz, 2H), 2.154(s, 6H), 1.767(t, <i>J</i> =7.2Hz, 2H); MS(<i>m/e</i>): 416.5 (M+1).

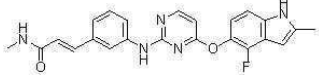
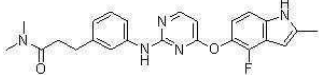
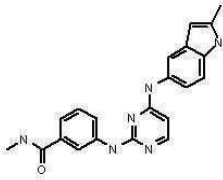
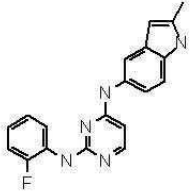
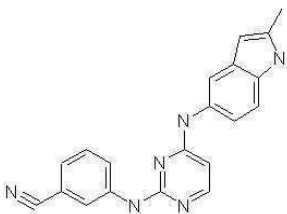
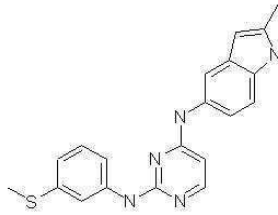
31	 <p>2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올</p>	(CD ₃ OD): 10.902(s, 1H), 9.087(s, 1H), 8.986(s, 1H), 7.917(d, J=4Hz, 1H), 7.683(s, 1H), 7.405(m, 2H), 7.227(m, 1H), 7.104(m, 1H), 6.458(d, J=8Hz, 1H), 6.141(s, 1H), 6.050(m, 2H), 5.594(m, 1H), 3.873(t, J=5.6Hz, 2H), 3.653(t, J=6Hz, 2H), 2.376(s, 3H); MS(<i>m/e</i>): 375.4 (M+1)
32	 <p>2-(2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올</p>	(CD ₃ OD): 10.851 (s, 1H), 9.117 (s, 1H), 8.431 (d, J=8.0 Hz 1H), 7.938 (d, J=6.0 Hz, 1H), 7.869 (s, 1H), 7.689 (br, 1H), 7.228 (d, J=8.8 Hz, 1H), 6.983~7.053 (m, 2H), 6.836~6.923 (m, 2H), 6.147 (d, J=6.0 Hz 1H), 6.079 (s, 1H), 5.137 (t, J=5.6 Hz 1H), 4.061 (q, J=11.2 Hz, 1.2 Hz 2H), 3.767 (q, J=9.6 Hz, 5.6 Hz 2H), 2.389 (s, 3H); MS(<i>m/e</i>): 376.3 (M+1).
33	 <p>N4-(2-메틸-1H-인돌-5-일)-N2-(2-(2-(모르폴리노에톡시)페닐)피리미딘-2,4-디아민</p>	(CD ₃ OD): 10.845 (s, 1H), 9.112 (s, 1H), 8.377 (d, J=7.6 Hz 1H), 7.935 (d, J=6.0 Hz, 1H), 7.823 (s, 1H), 7.647 (br, 1H), 7.219 (d, J=8.8 Hz, 1H), 7.061 (d, J=8 Hz, 2H), 6.889~6.950 (m, 2H), 6.147 (d, J=6.0 Hz 1H), 6.074 (s, 1H), 4.182 (t, J=6.0 Hz 2H), 3.592 (t, J=4.8 Hz, 4H), 2.692 (t, J=5.2 Hz, 2H), 2.471 (br, 4H), 2.388(s, 3H); MS(<i>m/e</i>): 445.3 (M+1).
34	 <p>N-메틸-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드</p>	(DMSO- <i>d</i> ₆): d 11.015 (s, 1H), 10.776 (s, 1H), 10.593 (s, 1H), 8.493 (d, J=4Hz, 1H), 7.938 (m, 2H), 7.803 (d, J=2Hz, 1H), 7.651 (m, 2H), 7.374 (m, 1H), 7.210 (m, 2H), 6.467 (m 1H), 6.046 (s, 1H), 2.779 (d, 4.4Hz, 3H), 2.379 (s, 3H); MS (<i>m/e</i>): 373.4 (M+1).
35	 <p>3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드</p>	(CD ₃ OD): 10.832(s, 1H), 9.156(s, 1H), 9.056(s, 1H), 8.157(s, 1H), 8.054(s, 1H), 7.946(m, 2H), 7.700(b, 1H), 7.319(m, 2H), 7.199(m, 2H), 6.159(s, 1H), 6.052(s, 1H), 3.180(t, J=5.6Hz, 2H), 2.378(s, 3H), 1.480(s, 6H), 1.372(s, 4H), 1.229(s, 2H). MS(<i>m/e</i>): 469.6 (M+1)
36	 <p>N-(2-(디메틸아미노)에틸)-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드</p>	(CD ₃ OD): 10.846(s, 1H), 9.149(s, 1H), 9.077(s, 1H), 8.181(t, J=5.6Hz, 1H), 8.036(m, 2H), 7.934(m, 1H), 7.706(b, 1H), 7.340(m, 1H), 7.270(m, 1H), 7.203(m, 1H), 7.137(m, 1H), 6.160(d, J=5.6Hz, 1H), 6.054(s, 1H), 3.313(t, J=6.4Hz, 2H), 3.175(t, J=5.6Hz, 2H), 2.376(s, 3H), 2.175(s, 6H). MS(<i>m/e</i>): 429.5 (M+1)
37	 <p>N2-(3-(4-메톡시페닐)-1H-피라졸-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민</p>	(DMSO- <i>d</i> ₆): d 12.354 (s, 1H), 10.911 (s, 1H), 8.985 (br, 2H), 7.901 (s, 1H), 7.599 (br, 2H), 7.259 (d, J=8.4 Hz, 1H), 7.037 (s, 1H), 6.941~6.913 (m, 2H), 6.099 (br, 2H), 3.787 (s, 3H), 2.493 (s, 3H); MS (<i>m/e</i>): 412.8 (M+1).

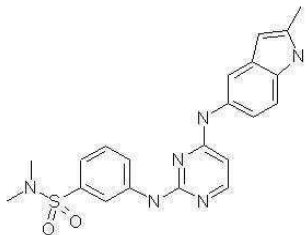
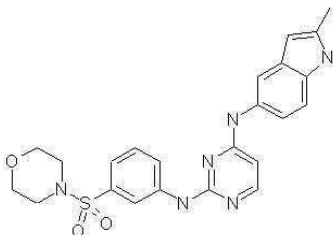

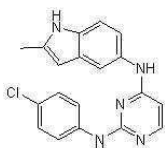
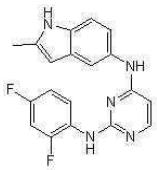

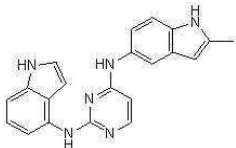
38	N-(3-에티닐페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	(CD ₃ OD): 8.190(d, <i>J</i> =6.0 Hz, 1H), 8.098(s, 1H), 7.612(s, 1H), 7.489(d, <i>J</i> =8.0 Hz, 1H), 7.339-7.284(m, 2H), 7.053(t, <i>J</i> =8.4 Hz, 1H), 6.937(dd, <i>J</i> =8.4Hz, 2.0Hz, 2H), 6.294(d, <i>J</i> =6.0Hz, 2H), 6.262(s, 1H), 2.495(s, 3H); MS(<i>m/e</i>): 341.1 (M+1)
39	N-(4-메톡시페닐)-4-(2-메틸-1H-인돌-5일옥시)피리미딘-2-아민 	(CD ₃ OD): 8.198(d, <i>J</i> =6.4 Hz, 1H), 7.974(s, 1H), 7.363-7.283(m, 2H), 6.935(m, 2H), 6.742(t, <i>J</i> =8.4 Hz, 1H), 6.260(s, 1H), 6.200(d, <i>J</i> =5.6 Hz, 1H), 3.771(s, 3H), 2.493(s, 3H). MS(<i>m/e</i>): 347.2 (M+1).
41	4-(2-메틸-1H-인돌-5-일옥시)-N-(4-페녹시페닐)피리미딘-2-아민 	(CD ₃ OD): 8.201 (d, <i>J</i> =5.6Hz, 1H), 7.373 (m, <i>J</i> =8.8-5.2Hz, 4H), 7.188 (d, <i>J</i> =2.0Hz, 1H), 7.081 (t, <i>J</i> =7.2-6.8 Hz, 1H), 6.989 (d, <i>J</i> =3.2 Hz, 2H), 6.890 (d, <i>J</i> =8.4 Hz, <i>J</i> =2.0 Hz, 1H), 6.644 (d, <i>J</i> =9.2 Hz, 2H), 6.323(d, <i>J</i> =6.4 Hz, 1H), 6.137(s, 1H), 2.376(s, 3H). MS(<i>m/e</i>): 409.3(M+1).
42	N-(3-메톡시페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	(CD ₃ OD): 8.236(d, <i>J</i> =5.2 Hz, 1H), 7.983(s, 1H), 7.314-7.283(m, 2H), 7.239(br, 1H), 7.063(t, <i>J</i> =8.0 Hz, 1H), 6.981(d, <i>J</i> =8.0 Hz, 1H), 6.981(dd, <i>J</i> =8.8 Hz, 2.0Hz, 1H), 6.528(d, <i>J</i> =8.0 Hz, 1H), 6.278-6.253(m, 1H), 3.571 (s, 1H), 2.493(s, 3H). MS(<i>m/e</i>): 347.2 (M+1).
43	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 	(CD ₃ OD): 8.298(s, 1H), 7.996(d, <i>J</i> =5.6 Hz, 1H), 7.385 (d, <i>J</i> =8.4Hz, 1H), 7.197 (t, <i>J</i> =8.0 Hz, 1H), 7.094(d, <i>J</i> =8.4 Hz, 2H), 6.791(s, 1H), 6.543 (d, <i>J</i> =8.0 Hz, 1H), 6.333(s, 1H), 5.995 (d, <i>J</i> =6.0 Hz, 1H), 5.321 (s, 1H), 3.974(t, <i>J</i> =5.6 Hz, 1H), 3.077(m, 8H), 2.699(t, <i>J</i> =6.8Hz, 1H), 2.468(s, 3H), 1.926(t, <i>J</i> =6.8 Hz, 2H);
44	N-메틸-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 	(DMSO-d ₆): 11.130 (s, 1H), 9.631 (s, 1H), 8.324(d, <i>J</i> =4.2Hz, 1H), 8.309 (s, 1H), 7.994 (s, 1H), 7.741 (s, 1H), 7.308 (d, <i>J</i> =9.2 Hz, 1H), 7.219 (d, <i>J</i> =1.6 Hz, 1H), 7.052 (t, <i>J</i> =2.0-0.8 Hz, 2H), 6.932 (m, 1H), 6.272 (d, <i>J</i> =3.6 Hz, 1H), 6.140 (d, <i>J</i> =4.2 Hz, 1H), 5.249 (s, 1H), 2.801 (s, 3H), 2.437 (s, 3H), 2.401(m, 2H); MS (<i>m/e</i>): 374.3(M+1)
45	트리플루오로-N-(4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	(DMSO-d ₆): 11.248 (s, 1H), 9.304 (s, 1H), 9.153(s, 1H), 7.960(s, 1H), 7.913(d, <i>J</i> =6.0Hz, 1H), 7.543 (d, <i>J</i> =4.4Hz, 2H), 7.132 (d, <i>J</i> =8.4Hz, 1H), 7.063 (m, 1H), 6.910 (t, <i>J</i> =3.6 Hz, 2H), 6.217 (s, 1H), 6.106 (t, <i>J</i> =1.6-2.4 Hz, 1H), 2.411(s, 3H) MS (<i>m/e</i>): 464.4(M+1)

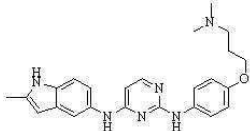
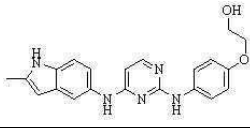
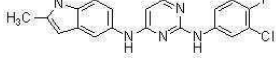
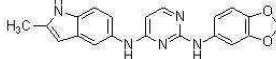
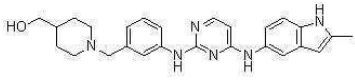
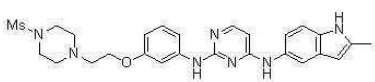
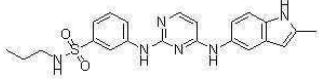
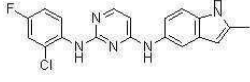
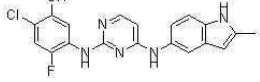
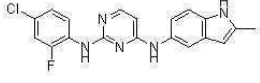
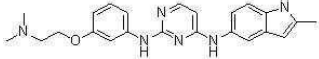
46	(S)-4-(2-메틸-2H-인돌-5-일옥시)-N-(3-(피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	(DMSO- <i>d</i> ₆): 11.122 (s, 1 H), 9.515 (s, 1 H), 8.306 (d, <i>J</i> =5.6 Hz, 1H), 7.156-7.332 (m, 4H), 6.951 (t, <i>J</i> =8.0 Hz, 1H), 6.827 (dd, <i>J</i> =8.4 Hz, 2.0 Hz, 1H), 6.427 (dd, <i>J</i> =8.4 Hz, 2.0 Hz, 1H), 6.267 (d, <i>J</i> =6.0 Hz, 1H), 6.139 (s, 1H), 6.639 (m, 2H), 4.652-4.711 (m, 1H), 2.964-3.154 (m, 4H), 2.401 (s, 3H), 1.958-1.993 (m, 1H), 1.825-1.898 (m, 1H); MS (<i>m/e</i>): 402.4 (M+1)
47	N-메틸-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤젠술폰아미드 	(CDCl ₃): 8.290 (d, 1H), 8.115 (s, 1H), 7.994 (s, 1H), 7.504 (d, <i>J</i> =8, 1H), 7.409 (m, 2H), 7.247 (d, <i>J</i> =8, 1H), 6.958 (m, <i>J</i> =10.8), 6.403 (d, <i>J</i> =5.6, 1H), 6.254 (s, 1H), 2.505 (s, 3H), 2.478 (d, <i>J</i> =5.6, 3H). MS (<i>m/e</i>): 410.1 (M+1)
48	N-(4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	(CD ₃ OD): 11.204 (s, 1H), 9.120 (s, 1H), 8.837 (s, 1H), 7.959 (d, <i>J</i> =5.6 Hz, 1H), 7.791 (d, <i>J</i> =6.8 Hz, 2H), 7.144 (s, 1H), 7.026 (d, <i>J</i> =7.6 Hz, 2H), 6.922 (d, <i>J</i> =7.2 Hz, 1H), 6.210 (s, 1H), 6.115 (s, 1H), 4.007 (s, 3H), 2.405 (s, 3H); MS (<i>m/e</i>): 358.2 (M+1).
49	2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드 	(CD ₃ OD): 11.211 (s, 1H), 8.935 (s, 1H), 8.760 (s, 1H), 7.959 (t, <i>J</i> =8.8-5.6 Hz, 2H), 7.376 (s, 1H), 7.276 (d, <i>J</i> =7.6 Hz, 1H), 7.120 (t, <i>J</i> =8.8-4.4 Hz, 1H), 6.896 (t, <i>J</i> =8.0 Hz, 2H), 6.403 (t, <i>J</i> =2.0-1.6 Hz, 1H), 6.205 (s, 1H), 6.004 (s, 1H), 3.560 (s, 3H), 2.405 (s, 3H); MS (<i>m/e</i>): 364.2 (M+1).
50	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술포닐)에톡시)페닐)피리미딘-2-아민 	(CD ₃ OD): 8.345 (s, 1H), 8.049 (s, 1H), 7.915 (d, <i>J</i> =6.0 Hz, 1H), 7.826 (s, 1H), 7.58 (d, <i>J</i> =8.8 Hz, 1H), 7.535 (m, <i>J</i> =7.2-6.8 Hz, 1H), 7.433 (d, <i>J</i> =7.6 Hz, 2H), 7.103 (d, <i>J</i> =7.6 Hz, 1H), 6.241 (s, 1H), 2.460 (s, 3H); MS (<i>m/e</i>): 402.2 (M+1).
51	N-메틸-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	11.217 (s, 1H), 8.998 (s, 1H), 8.789 (s, 1H), 7.947 (d, <i>J</i> =5.6 Hz, 1H), 7.595 (m, <i>J</i> =7.8-1.6 Hz, 2H), 7.133 (d, <i>J</i> =8.0 Hz, 2H), 7.000 (s, 1H), 6.721 (d, <i>J</i> =2.8 Hz, 1H), 6.211 (s, 1H), 6.021 (s, 1H), 2.403 (s, 3H), 2.346 (s, 3H); MS (<i>m/e</i>): 380.2 (M+1).
52	N4-(4-플루오로-2-메틸-1H-인돌-5-일)N2-(3-플루오로페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 11.234 (s, 1H), 9.256 (s, 1H), 8.898 (s, 1H), 7.966 (d, <i>J</i> =5.6 Hz, 1H), 7.752 (d, <i>J</i> =8.4 Hz, 1H), 7.393 (t, <i>J</i> =8.4 Hz, 1H), 7.133 (m, <i>J</i> =8.4-3.6 Hz, 3H), 6.612 (t, <i>J</i> =7.6-1.2 Hz, 1H), 6.239 (s, 1H), 6.050 (s, 1H), 2.402 (s, 3H); MS (<i>m/e</i>): 352.2 (M+1).
53	N2-(3-클로로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 11.221 (s, 1H), 8.965 (s, 1H), 8.775 (s, 1H), 7.927 (d, <i>J</i> =6.0 Hz, 1H), 7.619 (d, <i>J</i> =8.0 Hz, 2H), 7.128 (m, <i>J</i> =8.0-7.6 Hz, 2H), 6.958 (d, <i>J</i> =7.8 Hz, 2H), 6.210 (s, 1H), 2.411 (s, 3H); MS (<i>m/e</i>): 368.2 (M+1).

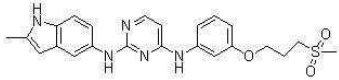
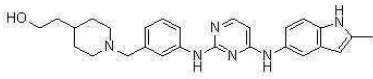
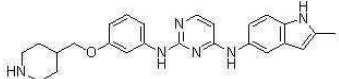
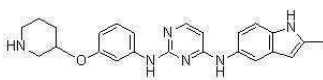
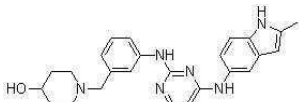
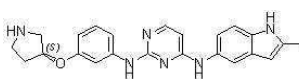
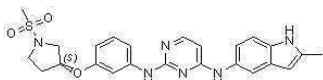
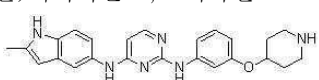
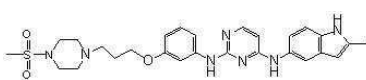
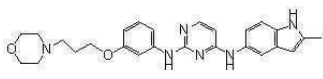
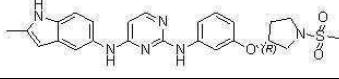
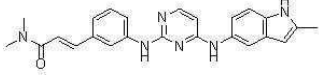
54	2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 	(CD ₃ OD): 11.248(s, 1H), 9.412 (s, 1H), 8.959 (s, 1H), 8.208 (s, 1H), 7.936(d, <i>J</i> =7.2 Hz, 1H), 7.562(d, <i>J</i> =5.6 Hz, 1H), 7.287(s, 2H), 7.164 (d, <i>J</i> =8.4Hz, 2H), 6.233(s, 1H), 6.075(s, 1H), 2.399 (s, 3H); MS(<i>m/e</i>): 359.2(M+1).
55	N2-(3,5-디메틸페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 11.200(s, 1H), 8.806 (s, 1H), 8.745 (s, 1H), 7.911 (d, <i>J</i> =6.0 Hz, 1H), 7.216(s, 2 H) 7.117(t, <i>J</i> =8.8-7.8 Hz, 2H), 6.396(s, 1H), 6.181(s, 1H), 6.010 (s, 1H), 2.381 (s, 3H); 1.985(s, 6H); MS(<i>m/e</i>): 362.3(M+1).
56	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-트리플루오로메틸)페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 11.211(s, 1H), 8.898 (s, 1H), 8.209 (s, 1H), 7.939 (t, <i>J</i> =9.6-6.0 Hz, 2H), 7.270(t, <i>J</i> =8.4-1.6Hz, 1 H) 7.126(s, 2H), 6.998(m, <i>J</i> =2.0-1.2 Hz, 2H), 6.225(s, 1H), 6.035 (s, 1H), 2.402 (s, 3H); MS(<i>m/e</i>): 402.2(M+1).
57	N2-(2-클로로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	(CD ₃ OD): 11.231(s, 1H), 8.922 (s, 1H), 8.143 (d, <i>J</i> =8.0 Hz, 1H), 7.936 (s, <i>J</i> =5.6 Hz, 1H), 7.790 (s, 1H), 7.424(d, <i>J</i> =8.4 Hz, 1H), 7.101(m, <i>J</i> =8.4-7.2 Hz, 2H), 6.993 (t, <i>J</i> =8.8-7.2 Hz, 1H), 6.216 (s, 1H), 6.093 (m, <i>J</i> =7.2-10.0 Hz, 1H), 4.043(s, <i>J</i> =7.8 Hz, 1H), 2.402 (s, 3H); MS(<i>m/e</i>): 368.2 (M+1).
59	N4-(4-프루오로-2-메틸-1H-인돌-5-일)-N2-(4-메톡시페닐)피리미딘-2,4-디아민 	11.222(s, 1H), 8.796 (s, 1H), 8.729 (s, 1H), (CD ₃ OD): 7.959(s, 1H), 7.892 (d, <i>J</i> =5.6 Hz, 1H), 7.547(d, <i>J</i> =8.8Hz, 2 H) 7.075(s, 1H), 6.646(d, <i>J</i> =7.6 Hz, 2H), 6.222(s, 1H), 5.567 (s, 1H), 3.658(s, 3H), 2.406 (s, 3H); MS(<i>m/e</i>): 402.2(M+1).
60	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(4-메톡시페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 11.190(s, 1H), 9.046(s, 1H), 8.801(s, 1H), 7.959(s, 1H), 7.931(d, <i>J</i> =6.0Hz, 1H), 7.681 (d, <i>J</i> =7.2 Hz, 2H), 7.361(t, <i>J</i> =8.0-7.6 Hz, 2H), 7.114(m, <i>J</i> =8.4-7.2Hz, 3H), 6.903(d, <i>J</i> =8.0 Hz, 2H), 6.755 (d, <i>J</i> =7.2Hz, 2H), 6.179(s, 1H), 6.024(s, 1H), 2.338 (s, 3H). MS(<i>m/e</i>): 426.2(M+1).
61	2-(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 	(CD ₃ OD): 7.932(s, 1H), 7.885(d, <i>J</i> =5.6Hz, 1H), 7.331(m, 1H), 7.204(m, 3H), 7.103(t, <i>J</i> =7.2Hz, 1H), 6.958(d, <i>J</i> =7.6Hz, 1H), 6.251(s, 1H), 6.176(m, 1H), 3.603-3.572(m, 4H), 3.068-3.041(m, 2H), 2.454(s, 3H), (m, 2H), 2.197(br, 2H), 1.783-1.750(m, 2H), 1.563(br, 2H), 1.477(m, 2H), 1.311-1.275(m, 2H). MS(<i>m/e</i>): 475.4(M+1)

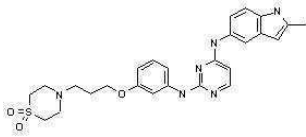
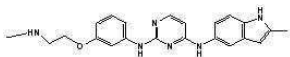
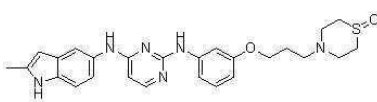
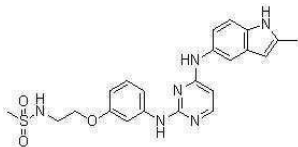
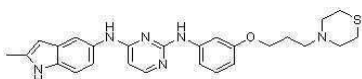
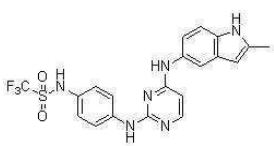
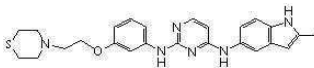
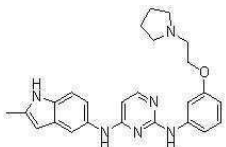
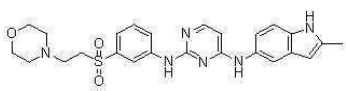
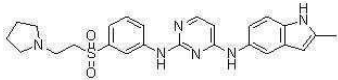
62	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(3-(메틸술포닐)프로폭시)페닐)피리미딘-2,4-디아민 	(DMSO-d ₆): 7.932 (d, <i>J</i> =6.0 Hz, 1H), 7.399 (s, 1H), 7.393 (d, <i>J</i> =6.8 Hz, 1H), 7.099 (m, 2H), 6.97 (m, 1H), 6.416 (d, <i>J</i> =8.0 Hz, 1H), 6.207 (s, 1H), 6.088 (s, 1H), 3.84 (m, 2H), 3.196 (m, 2H), 3.010 (s, 3H), 2.400 (s, 3H), 2.014 (m, 2H). MS (<i>m/e</i>): 470.5 (M+1).
63	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 	(DMSO-d ₆): 7.938 (d, <i>J</i> =6.0 Hz, 1H), 7.347 (m, 2H), 7.104 (m, 2H), 6.950 (m, 1H), 6.410 (d, <i>J</i> =8.0 Hz, 1H), 6.206 (s, 1H), 6.088 (s, 1H), 3.788 (m, 2H), 3.630 (m, 2H), 2.401 (s, 3H). MS (<i>m/e</i>): 394.4 (M+1).
64	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-3-일옥시)페닐)피리미딘-2,4-디아민 	(DMSO-d ₆): 11.241 (s, 1H), 8.966 (s, 1H), 8.789 (s, 1H), 7.929 (d, <i>J</i> =5.6 Hz, 1H), 7.378 (s, 1H), 7.267 (d, <i>J</i> =7.6 Hz, 1H), 7.120-7.053 (m, 2H), 6.964 (m, 1H), 6.380 (d, <i>J</i> =8.0 Hz, 1H), 6.207 (s, 1H), 6.010 (s, 1H), 4.010 (s, 1H), 3.710 (m, 1H), 3.554 (s, 2H), 3.362 (m, 2H), 2.506 (s, 3H), 2.401 (m, 2H), 1.234 (m, 2H). MS (<i>m/e</i>): 433.2 (M+1).
65	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((1-(메틸술포닐)피페리딘-4-일)메톡시)페닐)피리미딘-2,4-디아민 	(CD ₃ OD): 8.021 (d, <i>J</i> =5.6 Hz, 1H), 7.418 (s, 1H), 7.220-7.051 (m, 3H), 6.998 (m, 1H), 6.612 (d, <i>J</i> =7.4 Hz, 1H), 6.267 (s, 1H), 5.800 (d, <i>J</i> =5.6 Hz, 1H), 3.960 (d, <i>J</i> =5.2 Hz, 2H), 3.810 (m, 2H), 3.362 (m, 2H), 2.826 (s, 3H), 2.506 (s, 3H), 1.556 (m, 2H), 1.452 (m, 1H), 1.234 (m, 2H).
66	1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-올 	(CD ₃ OD): 8.247 (d, <i>J</i> =5.6 Hz, 1H), 7.378 (s, 1H), 7.160-7.108 (m, 2H), 6.956 (t, <i>J</i> =8.0 Hz, 1H), 6.895-6.825 (m, 2H), 6.450 (d, <i>J</i> =5.6 Hz, 1H), 6.247 (s, 1H), 3.031 (s, 1H), 2.690-2.663 (m, 2H), 2.455 (s, 3H), 2.069-2.042 (m, 2H), 1.815-1.716 (m, 2H), 1.562-1.483 (m, 2H); MS (<i>m/e</i>): 448.5 (M+1).
67	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(메틸술포닐)페닐)피리미딘-2-아민 	(CD ₃ OD): 8.292 (d, <i>J</i> =5.6 Hz, 1H), 8.005 (s, 1H), 7.691 (d, <i>J</i> =7.2 Hz, 1H), 7.341 (d, <i>J</i> =7.2 Hz, 1H), 7.102 (d, <i>J</i> =8.8 Hz, 1H), 7.013 (t, <i>J</i> =7.2 Hz, 1H), 6.849 (t, <i>J</i> =8.0 Hz, 1H), 6.482 (d, <i>J</i> =5.6 Hz, 1H), 6.221 (s, 1H), 2.900 (s, 3H), 2.432 (s, 3H); MS (<i>m/e</i>): 413.4 (M+1).
68	N-사이클로프로필-2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아세트아미드 	(DMSO-d ₆): 7.947 (m, 2H), 7.298 (m, 2H), 7.154 (d, <i>J</i> =8.4 Hz, 1H), 6.947 (m, 1H), 6.755 (m, 1H), 6.775 (d, <i>J</i> =8.0 Hz, 1H), 6.441 (d, <i>J</i> =5.6 Hz, 1H), 6.240 (s, 1H), 3.027 (s, 2H), 2.593 (m, 1H), 2.499 (s, 3H), 0.596 (m, 2H), 0.390 (m, 2H). MS (<i>m/e</i>): 432.5 (M+1).

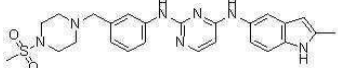
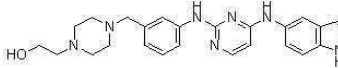
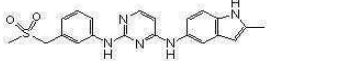
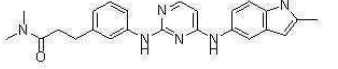
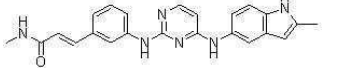
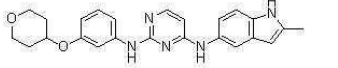
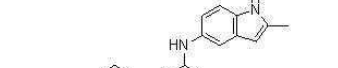
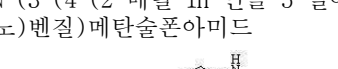
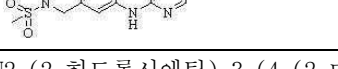
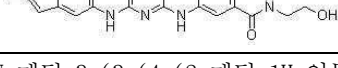
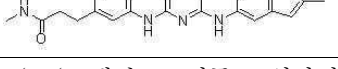
69	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-메틸아크릴아미드 	(DMSO-d ₆) : 11.550 (s, 1H), 9.791 (s, 1H), 8.385 (d, J=5.2, 1H), 8.114 (d, J=4.8, 1H), 7.432 (d, J=7.2, 2H), 7.214 (d, J=10, 1H), 7.184 (d, J=3.2, 1H), 7.083 (d, J=8, 2H), 6.942 (m, J=16, 1H), 6.533 (d, J=5.6, 1H), 6.402 (d, J=15.6), 6.253 (s, 1H), 2.687 (d, J=4.8, 3H), 2.440 (s, 3H). MS (m/e): 418.2 (M+1)
70	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N,N-디메틸프로판아미드 	(DMSO-d ₆) : 11.397 (s, 1H), 9.420 (s, 1H), 8.334 (d, J=5.6, 1H), 7.290 (s, 1H), 7.241 (d, J=7.2, 1H), 7.152 (d, J=8.8, 1H), 6.919 (m, J=15.2, 1H), 6.803 (m, J=15.6, 1H), 6.652 (d, J=6.8, 1H), 6.451 (d, J=5.6, 1H), 6.218 (s, 1H), 2.860 (s, 3H), 2.795 (s, 3H), 2.449 (m, J=14.8, 2H), 2.399 (s, 3H), 2.338 (m, J=14.8, 2H). MS (m/e): 434.2 (M+1)
71	N-메틸-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 372.4 (M)
72	N2-(2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 350.1 (M+1)
73	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 	MS (m/e): 341.2 (M+1)
74	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(메틸티오)페닐)피리미딘-2,4-디아민 	MS (m/e): 362.3 (M+1)

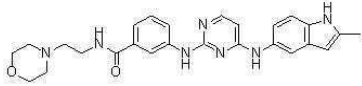
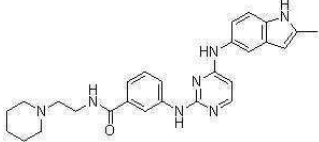
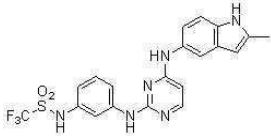
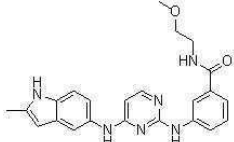
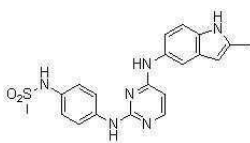
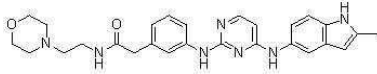
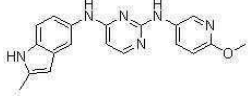

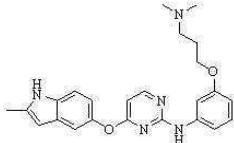
75	N,N-디메틸-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤젠술폰아미드 	MS (m/e): 423.5 (M+1)
76	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(모르폴리노술폰닐)페닐)피리미딘-2,4-디아민 	MS (m/e): 465.4 (M+1)
77	N2-(3,4-디메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 376.3(M+1)
78	N2-(4-클로로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 350.3 (M+1)
79	N2-(2,4-디플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 352.2 (M+1)
80	N2-(3-클로로-2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 368.3 (M+1)
81	N2-(1H-인돌-4-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 355.3(M+1)

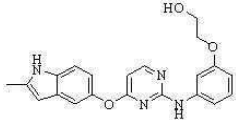
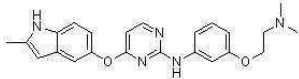
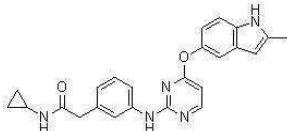
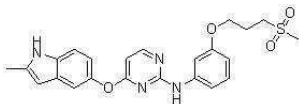
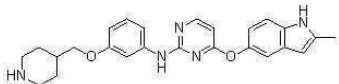
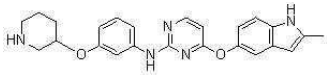
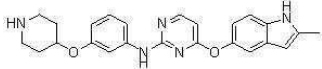
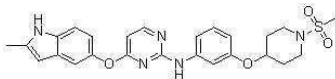
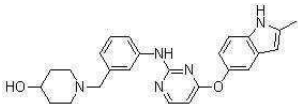
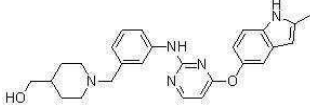
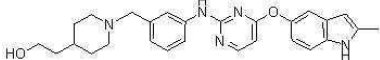
82	N2-(4-(3-(디메틸아미노)프로폭시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 417.4(M+1)
83	2-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 	MS (m/e): 376.3(M+1)
84	N2-(3-클로로-4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 368.3 (M+1)
85	N2-(벤조[d][1,3]디옥솔-5-일)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 360.3 (M+1)
86	(1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피레리딘-4-일)메탄올 	MS (m/e): 443.4 (M+1)
87	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-(4-(메틸술포닐)피페라진-1-일)에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 521.2(M)
88	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-프로필벤젠설폰아미드 	MS (m/e): 437.3 (M+1)
89	N2-(2-클로로-4-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 368.1(M+1)
90	2-클로로-4-플루오로-5-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	MS (m/e): 384.3(M+1)
91	N2-(4-클로로-2-플루오로페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 368.3(M+1)
92	N2-(3-(2-(디메틸아미노)에톡시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 403.4 (M+1)

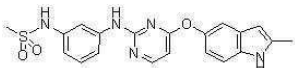
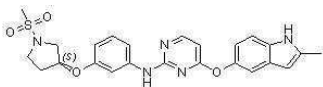
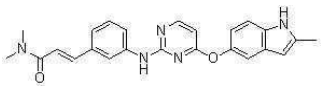
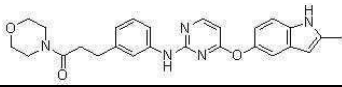
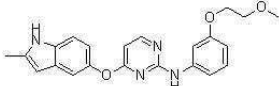
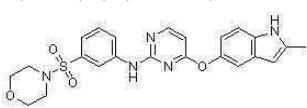
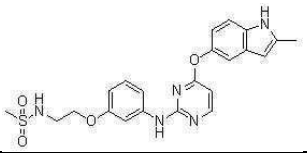
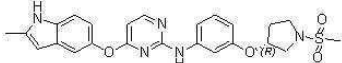
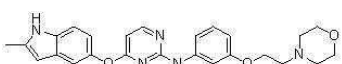
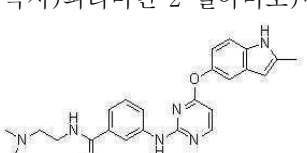
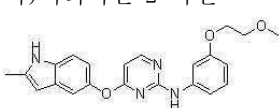
93	N2-(2-메틸-1H-인돌-5-일)-N4-(3-(3-(메틸술포닐)프로폭시)페닐)피리미딘-2,4-디아민 	MS (m/e): 452.3(M+1)
94	2-(1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피페리딘-2-일아미노)벤질)피페리딘-4-일)에탄올 	MS (m/e): 457.4 (M+1)
95	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-4-일메톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 429.4 (M+1)
96	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-3-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 416.4 (M+1)
97	1-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-올 	MS (m/e): 429.4(M+1)
98	(S)-N4-(2-메틸-1H-인돌-5-일)-N2-(3-(피롤리딘-3-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 401.4(M+1)
99	(S)-N4-(2-메틸-1H-인돌-5-일)-N2-(3-(1-(메틸술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 479.5(M+1)
100	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(피페리딘-4-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 415.5 (M+1)
101	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-(4-(메틸술포닐)피페라진-1-일)프로폭시)페닐)피리미딘-2,4-디아민 	MS (m/e): 536.6 (M+1)
102	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-모르폴리노프로폭시)페닐)피리미딘-2,4-디아민 	MS (m/e): 459.6 (M+1)
103	(R)-N4-(2-메틸-1H-인돌-5-일)-N2-(3-(1-(메틸술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2,4-디아민 	Ms (m/e): 479.5 (M+1)
104	(E)-N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아크릴아미드 	MS (m/e): 413.2(M+1)

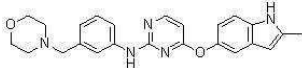
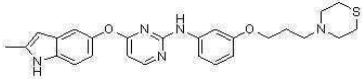
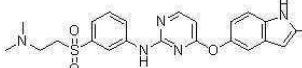
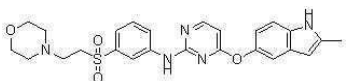
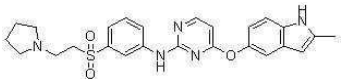
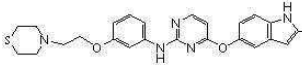
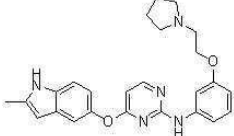
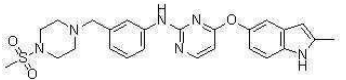
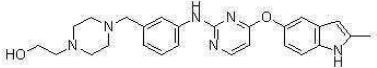
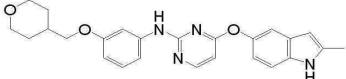
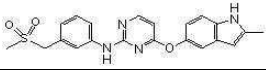
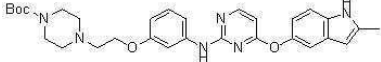
105	4-(4-플루오로-2-메틸-1H-인돌-5-일)-N-(3-(3-(티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 507.5(M+1)
106	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 389.5(M+1)
107	4-(4-(플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(티오모르폴리노-1'-옥사이드)프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 491.5 (M+1)
108	N-(2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 	MS (m/e): 453.4 (M+1)
109	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2,4-디아민 	Ms (m/e): 475.5(M+1)
110	트리플루오로-N-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 463.4 (M+1)
111	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-피롤리딘에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 461.4 (M+1)
112	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-피롤리딘에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 429.4(M+1)
113	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에틸술폰)페닐)피리미딘-2,4-디아민 	MS (m/e): 493.1 (M+1)
114	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(2-(피롤리딘-1-일)에틸술폰)페닐)피리미딘-2,4-디아민 	MS (m/e): 477.1(M+1)

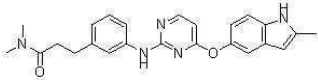
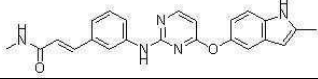
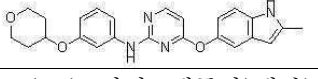
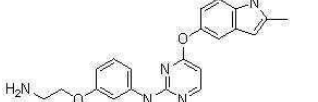
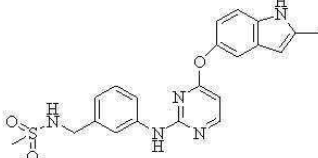
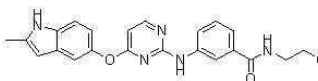
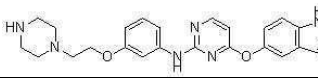
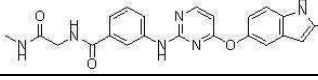
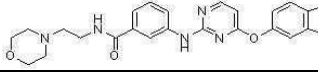
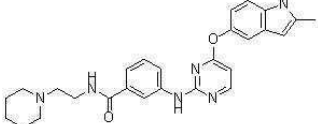
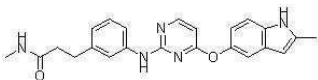
115	N4-(2-메틸-1H-인돌-5-일)-N2-(3-((4-(메틸술폰닐)피페라진-1-일)메틸)페닐)피리미딘-2,4-디아민 	MS (m/e): 492.4 (M+1)
116	2-(4-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 	MS (m/e): 458.5 (M+1)
117	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(메틸술폰닐메틸)페닐)피리미딘-2,4-디아민 	MS (m/e): 408.3 (M+1)
118	N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)프로판아미드 	MS (m/e): 415.5(M+1)
119	(E)-N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아크릴아미드 	MS (m/e): 399.2(M+1)
120	N4-(2-메틸-1H-인돌-5-일)-N2-(3-(테트라히드로-2H-피란-4-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 416.4 (M+1)
121	N2-(3-(2-아미노에톡시)페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 375.3(M+1)
122	N-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)메탄술폰아미드 	MS (m/e): 423.4(M+1)
123	N2-(2-히드록시에틸)-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 403.2(M+1)
124	N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)프로판아미드 	MS (m/e): 401.2 (M+1)
125	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(메틸아미노)-2-옥소에틸)벤즈아미드 	MS (m/e): 430.2 (M+1)

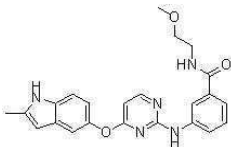
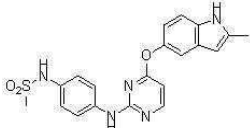
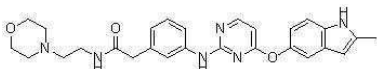
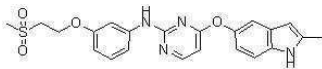
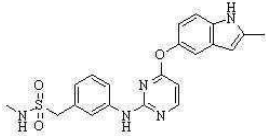
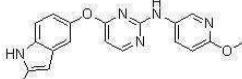

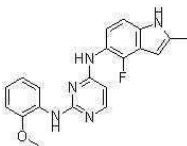
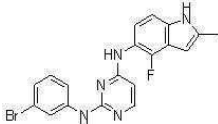
126	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-모르폴리노에틸)벤즈아미드 	MS (m/e): 472.3 (M+1)
127	3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드 	MS (m/e): 470.1 (M+1)
128	트리플루오로-N-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 463.0 (M+1)
129	N-(2-메톡시에틸)-3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 417.2(M+1)
130	N-(4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 409.1 (M+1)
131	2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드 	MS (m/e): 493.1 (M+1)
132	N2-(6-메톡시피리딘-3-일)-N4-(2-메틸-1H-인돌-5-일)피리딘-2,4-디아민 	MS (m/e): 347.4(M+1)
133	2-메틸-N-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일)-1H-인돌-5-아민 	MS (m/e): 370.3 (M+1)
134	N-(3-(3-(디메틸아미노)프로폭시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 418.4(M+1)

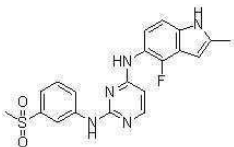
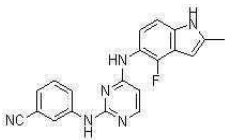
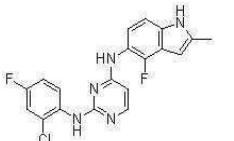
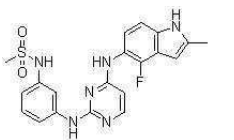
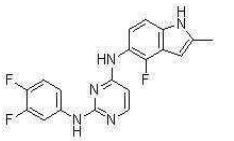
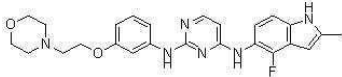
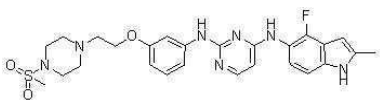
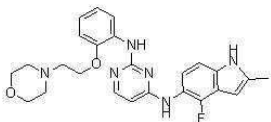
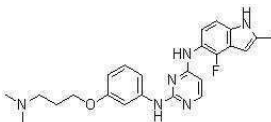
135	2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에탄올 	MS (m/e): 377.4(M+1)
136	N-(3-(2-(디메틸아미노)에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 404.4(M+1)
137	N-사이클로프로필-2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아세트아미드 	MS (m/e): 414.4 (M+1)
138	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(메틸술포닐)프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 453.4 (M+1)
139	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(피페리딘-4-일메톡시)페닐)피리미딘-2-아민 	MS (m/e): 448.2 (M+1)
140	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(피페리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 416.2 (M+1)
141	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(피페리딘-4-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 416.4 (M+1)
142	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메톡시술포닐)피페리딘-4-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 494.5 (M+1)
143	1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-올 	MS (m/e): 430.4 (M+1)
144	(1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 	MS (m/e): 444.4 (M+1)
145	2-(1-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 	MS (m/e): 458.5(M+1)

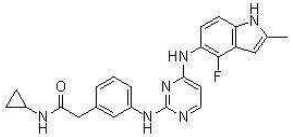
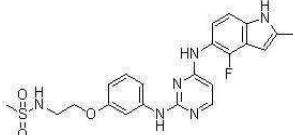
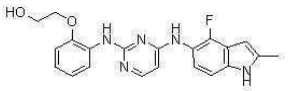
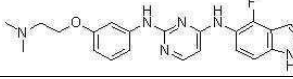
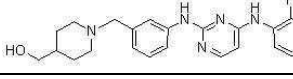
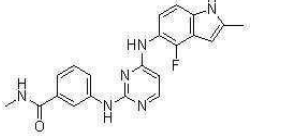
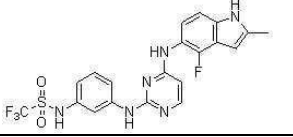
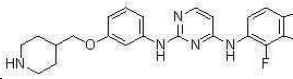
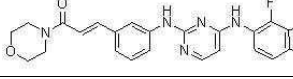
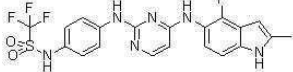
146	N-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 409.12 (M+1)
147	(S)-4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메톡시술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 480.5(M+1)
148	(E)-N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아크릴아미드 	MS (m/e): 414.5 (M+1)
149	3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-1-모르폴리노프로판-1-온 	MS (m/e): 458.5(M+1)
150	N-(3-(2-메톡시에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 391.0 (M+1)
151	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(모르폴리노술포닐)페닐)피리미딘-2-아민 	MS (m/e): 465.1 (M+1)
152	N-(2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 	MS (m/e): 454.2 (M+1)
153	(R)-4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메틸술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 480.5(M+1)
154	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에톡시)페닐)피리미딘-2-아민 	MS (m/e): 446.4 (M+1)
155	N2-(2-(디메틸아미노)에틸)-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 431.4 (M+1)
156	N-(3-(2-메톡시에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 391.3 (M+1)

157	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(모르폴리노메틸)페닐)피리미딘-2-아민 	MS (m/e): 416.4(M+1)
158	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 476.5 (M+1)
159	N-(3-2-(디메틸아미노)에틸술포닐)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 452.4 (M+1)
160	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에틸술포닐)페닐)피리미딘-2-아민 	MS (m/e): 494.4(M+1)
161	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-피롤리딘-1-일)에틸술포닐)페닐)피리미딘-2-아민 	MS (m/e): 478.4 (M+1)
162	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2-아민 	MS (m/e): 462.4 (M+1)
163	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2-아민 	MS (m/e): 430.3 (M+1)
164	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-((4-(메틸술포닐)피페라진-1-일)메틸)페닐)피리미딘-2-아민 	MS (m/e): 493.5 (M+1)
165	2-(4-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 	MS (m/e): 459.5(M+1)
166	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2-아민 	MS (m/e): 431.3(M+1)
167	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(메틸술포닐메틸)페닐)피리미딘-2-아민 	MS (m/e): 409.4 (M+1)
168	터트-부틸 4-(2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트 	MS (m/e): 545.4(M+1)

169	N,N-디메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)프로판아미드 	MS (m/e): 416.5 (M+1)
170	(E)-N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)아크릴아미드 	MS (m/e): 400.2 (M+1)
171	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(테트라히드로-2H-피란-4-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 416.18(M+1)
172	N-(3-(2-아미노에톡시)페닐)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e); 376.3(M+1)
173	N-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)메탄술폰아미드 	MS (m/e): 424.4 (M+1)
174	N-(2-히드록시에틸)-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 404.1 (M+1)
175	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피페라진-1-일)에톡시)페닐)피리미딘-2-아민 	MS (m/e): 444.5 (M)
176	3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-(메틸아미노)-2-옥소에틸)벤즈아미드 	MS (m/e): 431.2 (M+1)
177	3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-모르폴리노에틸)벤즈아미드 	MS (m/e): 473.0 (M+1)
178	3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드 	MS (m/e): 471.4 (M+1)
179	N-메틸-3-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)프로판아미드 	MS (m/e): 402.2 (M+1)

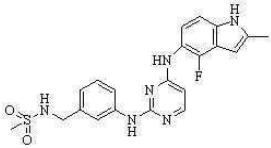
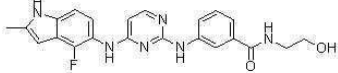
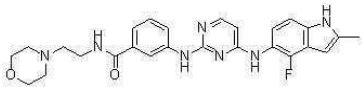
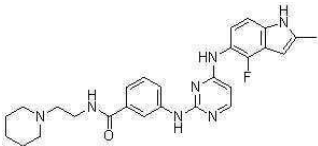
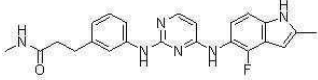
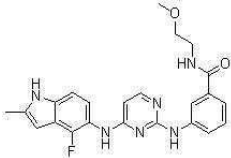
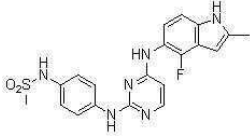
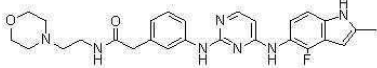
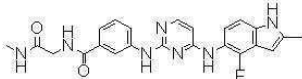
180	N-(2-메톡시에틸)-3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 418.1 (M+1)
181	N-(4-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 410.2 (M+1)
182	2-(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드 	MS (m/e): 487.1(M+1)
183	4-(2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술폰닐)에톡시)페닐)피리미딘-2-아민 	MS (m/e): 439.2 (M+1)
184	N-메틸(3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 424.4 (M+1)
185	N-(6-메톡시피리딘-3-일)-4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 348.2 (M+1)
186	메틸 2-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세테이트 	MS (m/e): 406.2 (M+1)
187	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-메톡시페닐)피리미딘-2,4-디아민 	MS (m/e): 364.2 (M+1)
188	N2-(3-브로모페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 412.3 (M+1)

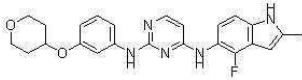
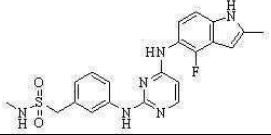
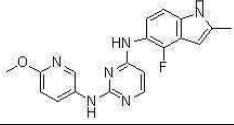
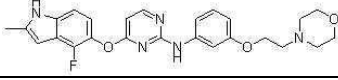
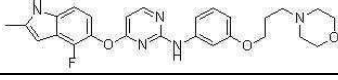
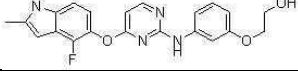
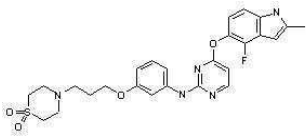
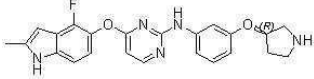
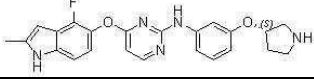
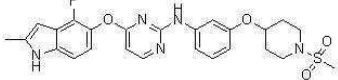
189	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(메틸술포닐)페닐)피리미딘-2,4-디아민 	MS (m/e): 412.3(M+1)
190	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴 	MS (m/e): 359.3 (M+1)
191	N2-(2-클로로-4-플루오로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 386.2 (M+1)
192	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 427.3(M+1)
193	N2-(3,4-디플루오로페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 370.2(M+1)
194	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 463.4 (M+1)
195	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(4-(메틸술포닐)피페라진-1-일)에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 540.3 (M+1)
196	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(2-(2-모르폴리노에톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 462.3 (M)
197	N2-(3-(3-(디메틸아미노)프로폭시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 435.4 (M+1)

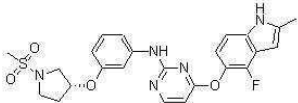
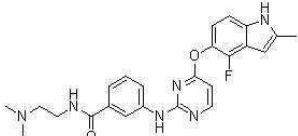
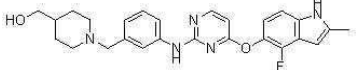
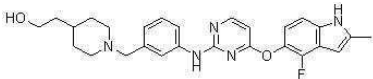
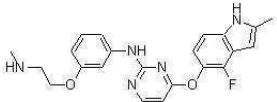
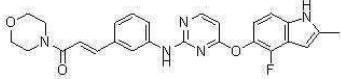
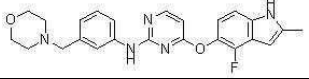
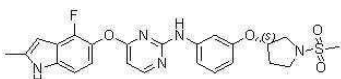
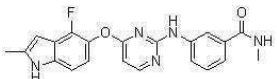
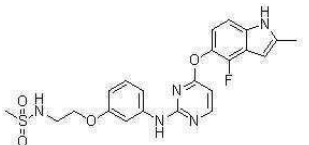
198	N-사이클로프로필-2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세트아미드 	MS (m/e): 431.4(M+1)
199	N-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)메탄술폰아미드 	MS (m/e): 471.4 (M+1)
200	2-(2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에탄올 	MS (m/e): 394.4 (M+1)
201	N2-(3-(2-(디메틸아미노)에톡시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 421.4(M+1)
202	(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 	MS (m/e): 461.5(M+1)
203	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-메틸벤즈아미드 	MS (m/e): 391.3(M+1)
204	트리플루오로-N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 481.3(M+1)
205	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-피페리딘-4-일메톡시)페닐)피리미딘-2,4-디아민 	MS (m/e): 446.22(M+1)
206	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-1-모르폴리노프로프-2-엔-1-온 	MS (m/e): 473.5 (M+1)
207	트리플루오로-N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 481.3 (M+1)

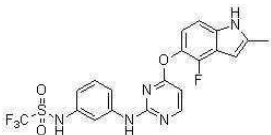
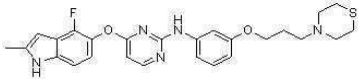
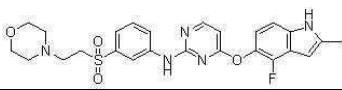
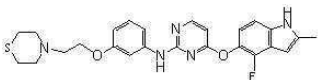
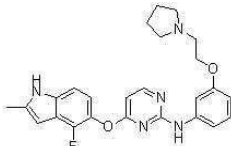
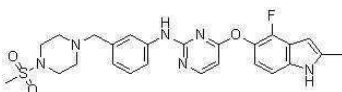
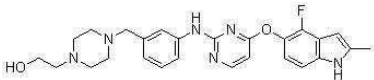
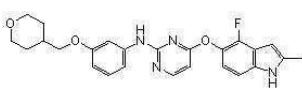
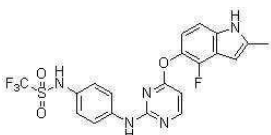
208	N-(5-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)아세트아미드	MS (m/e): 392.4 (M+1)
209	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(모르폴리노술포닐)페닐)피리미딘-2,4-디아민	MS (m/e): 483.5 (M+1)
210	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-메틸벤젠술포아미드	MS (m/e): 427.1(M+1)
211	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-메톡시에톡시)페닐)피리미딘-2,4-디아민	MS (m/e): 408.4 (M+1)
212	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-메톡시에톡시)페닐)피리미딘-2,4-디아민	MS (m/e): 525.5(M+1)
213	N-(2-(디메틸아미노)에틸)-3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤즈아미드	MS (m/e): 448.5 (M+1)
214	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2,4-디아민	MS (m/e): 407.5(M+1)
215	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-1-모르폴리노프로프-2엔-1-온	MS (m/e): 473.1(M+1)
216	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2,4-디아민	MS (m/e): 493.5(M+1)
217	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-모르폴리노에틸술포닐)페닐)피리미딘-2,4-디아민	MS (m/e): 511.4(M+1)
218	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2,4-디아민	MS (m/e): 479.4 (M+1)

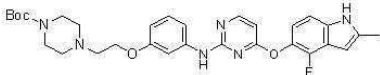
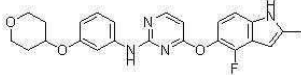
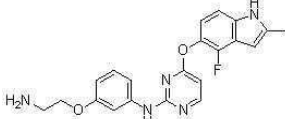
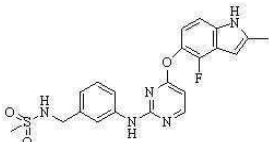
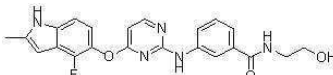
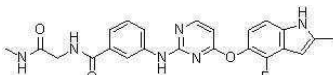
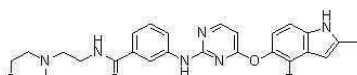
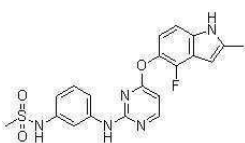
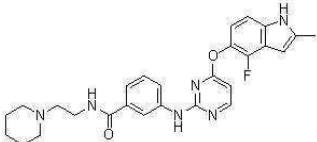
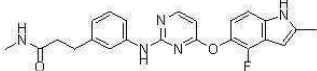
219	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2,4-디아민	MS (m/e): 447.4 (M+1)
220	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((4-(메틸술포닐)피페라진-1-일)메틸)페닐)피리미딘-2,4-디아민	MS (m/e): 510(M+1)
221	2-(4-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올	MS (m/e): 474.7 (M+1)
222	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐메탄술포네이트	MS (m/e): 428.4(M+1)
223	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(메틸술포닐메틸)페닐)피리미딘-2,4-디아민	MS (m/e): 426.4(M+1)
224	터트-부틸 4-(2-(3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트	MS (m/e): 544.4(M+1)
225	터트-부틸 4-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페녹시)에틸)피페라진-1-카르복실레이트	MS (m/e): 562.3 (M+1)
226	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노))페닐)-N,N-디메틸프로판아미드	MS (m/e): 433.4 (M+1)
227	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-메틸아크릴아미드	MS (m/e): 417.2 (M+1)
228	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2,4-디아민	MS (m/e); 448.4 (M+1)
229	N2-(3-(2-아미노에톡시)페닐)-N4-(4-플루오로-2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민	MS (m/e): 393.2 (M+1)

230	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)메탄술폰아미드 	MS (m/e): 441.4 (M+1)
231	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-히드록시에틸)벤즈아미드 	MS (m/e): 421.2 (M+1)
232	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-모르폴리노에틸)벤즈아미드 	MS (m/e): 490.1 (M+1)
233	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드 	MS (m/e): 488.4 (M+1)
234	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-메틸프로판아미드 	MS (m/e): 419.2 (M+1)
235	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-메톡시에틸)벤즈아미드 	MS (m/e): 435.2(M+1)
236	N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 427.2 (M+1)
237	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드 	Ms (m/e): 504.1(M+1)
238	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-N-(2-(메틸아미노)-2-옥소에틸)벤즈아미드 	MS (m/e): 448.2 (M+1)

239	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(3-(테트라히드로-2H-피란-4-일옥시)페닐)피리미딘-2,4-디아민 	MS (m/e): 434.4 (M+1)
240	1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤질)술포닐-메틸아민 	MS (m/e): 441.4 (M+1)
241	N4-(4-플루오로-2-메틸-1H-인돌-5-일)-N2-(6-메톡시피리딘-3-일)피리미딘-2,4-디아민 	MS (m/e); 365.4 (M+1)
242	N4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에톡시)페닐)피리미딘-2-아민 	MS (m/e): 464.4 (M+1)
243	N4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-모르폴리노프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 478.4 (M+1)
244	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에탄올 	MS (m/e): 395.4 (M+1)
245	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-(티오모르폴리노-1',1'-디옥사이드)프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 526.7 (M+1)
246	(R)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 420.5 (M+1)
247	(S)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 420.5 (M+1)
248	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메틸술포닐)피페리딘-4-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 512.4 (M+1)

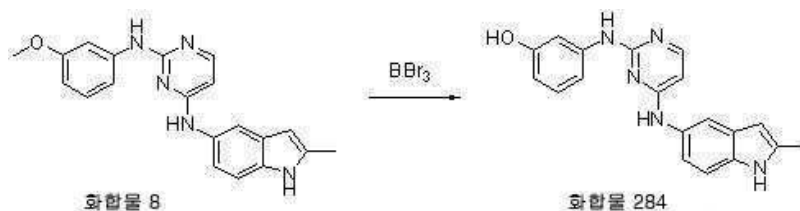
249	(R)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메틸술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 498.4(M+1)
250	N-(2-(디메틸아미노)에틸)-3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤즈아미드 	MS (m/e): 448.5(M+1)
251	(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)메탄올 	MS (m/e): 462.4 (M+1)
252	2-(1-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페리딘-4-일)에탄올 	MS (m/e): 476.5(M+1)
253	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸아미노)에톡시)페닐)피리미딘-2-아민 	MS (m/e): 408.4 (M+1)
254	(E)-3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-1-모르폴리노프로프-2-엔-1-온 	MS (m/e): 474.5(M+1)
255	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(모르폴리노메틸)페닐)피리미딘-2-아민 	MS (m/e): 434.5 (M+1)
256	(S)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(1-(메틸술포닐)피롤리딘-3-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 498.4 (M+1)
257	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-메틸벤즈아미드 	MS (m/e): 392.4 (M+1)
258	N-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페녹시)에틸)메탄술포나미드 	MS (m/e): 472.4 (M+1)

259	트리플루오로-N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 482.3(M+1)
260	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(3-티오모르폴리노프로폭시)페닐)피리미딘-2-아민 	MS (m/e): 494.5 (M+1)
261	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피롤리딘-1-일)에틸술폰닐)페닐)피리미딘-2-아민 	MS (m/e): 496.4 (M+1)
262	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-모르폴리노에틸술폰닐)페닐)피리미딘-2-아민 	MS (m/e): 512.4 (M+1)
263	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-티오모르폴리노에톡시)페닐)피리미딘-2-아민 	MS (m/e): 480.4(M+1)
264	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(피롤리딘-1-일)에톡시)페닐)피리미딘-2-아민 	MS (m/e): 448.4 (M+1)
265	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-((4-(메틸술폰닐)피페라진-1-일)메틸)페닐)피리미딘-2-아민 	MS (m/e): 511.4 (M+1)
266	2-(4-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)피페라진-1-일)에탄올 	MS (m/e): 477.5(M+1)
267	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-((테트라히드로-2H-피란-4-일)메톡시)페닐)피리미딘-2-아민 	MS (m/e): 449.4 (M+1)
268	트리플루오로-N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 482.3 (M+1)

269	터트-부틸 4-(2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)에틸)피페라진-1-카르복실레이트 	MS (m/e): 563.4 (M+1)
270	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(테트라히드로-2H-피란-4-일옥시)페닐)피리미딘-2-아민 	MS (m/e): 435.4 (M+1)
271	N-(3-(2-아미노에톡시)페닐)-4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-아민 	MS (m/e): 394.4 (M+1)
272	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)벤질)메탄술폰아미드 	MS (m/e): 442.4 (M+1)
273	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-히드록시에틸)벤즈아미드 	MS (m/e): 422.1 (M+1)
274	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-(메틸아미노)-2-옥소에틸)벤즈아미드 	MS (m/e): 449.5 (M+1)
275	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-모르폴리노에틸)벤즈아미드 	MS (m/e): 491.1 (M+1)
276	N-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드 	MS (m/e): 428.1 (M+1)
277	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-(피페리딘-1-일)에틸)벤즈아미드 	MS (m/e): 489.1 (M+1)
278	3-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-메틸프로판아미드 	MS (m/e): 420.2 (M+1)

279	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)-N-(2-메톡시에틸)벤즈아미드	MS (m/e): 436.1 (M+1)
280	N-(4-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)메탄술폰아미드	MS (m/e): 428.1(M+1)
281	2-(3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페닐)-N-(2-모르폴리노에틸)아세트아미드	MS (m/e): 505.1(M+1)
282	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(3-(2-(메틸술폰)에톡시)페닐)피리미딘-2-아민	MS (m/e): 457.2 (M+1)
283	4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)-N-(6-메톡시피리딘-3-일)피리미딘-2-아민	MS (m/e): 366.4 (M+1)

[0049] 실시예 284: 3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀(화합물 284)의 합성:



[0050]

[0051] CH₂Cl₂ 5 ml dp 용해된 N2-(3-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민(0.1 mmol)의 용액을 얼음 수조에 두었다. 여기에 BBr₃(0.5 mmol)을 첨가하였다. 반응 혼합물은 상온에서 하룻밤 동안 교반되었고, 얼음 수조에다 부어졌으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 잔류물은 칼럼 크로마토그래피로 정제시켜 83% 수율의 원하는 생성물을 얻게 되었다.

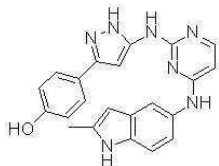

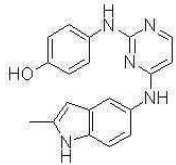
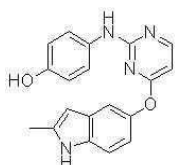
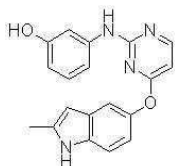


[0052] ¹H NMR (DMSO-*d*₆, 400 MHz): d 10.501 (s, 1H), 9.115 (s, 1H), 8.956 (s, 1H), 8.868 (s, 1H), 7.908 (d, *J*=6Hz, 1H), 7.716 (s, 1H), 7.271 (d, *J*=8Hz, 1H), 7.210 (d, *J*=8.4Hz, 1H), 7.114 (d, *J*=8Hz, 1H), 6.968 (t, *J*=8Hz, 1H), 6.322 (dd, *J*=8, 1.6Hz, 1H), 6.097 (m, 2H), 2.377 (s, 3H); MS (*m/e*): 331.4 (M+1).


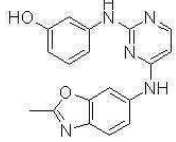
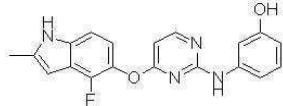
[0053] 실시예 285 내지 295: 화합물 285 내지 295의 합성

[0054]

화합물 285 내지 295 각각은 실시예 284에 기술된 것과 유사한 방식으로 합성되었다.

[0055]

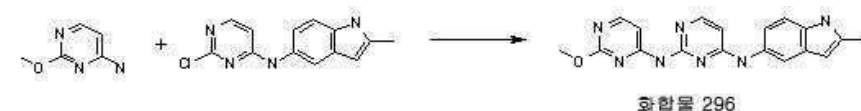
화합물	명칭	¹ H NMR (CD ₃ OD, 400 MHz)/MS
285	4-(5-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)-1H-피라졸-3-일)페놀 	7.863 (d, <i>J</i> =6.0 Hz, 1H), 7.286 (d, <i>J</i> =8.8 Hz, 1H), 6.830 (br, 2H), 6.125-6.080(m, 4H), 5.558-5.527 (m, 2H), 2.415(s,3H); MS(<i>m/e</i>): 411.8 (M+1).
286	2-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	7.791(d, <i>J</i> =6.0 Hz, 2H), 7.584(s, 1H), 7.047 (d, <i>J</i> =8.8 Hz, 1H), 7.063 (d, <i>J</i> =7.6 Hz, 1H), 6.974(t, <i>J</i> =7.6 Hz, 1H), 6.882(d, <i>J</i> =8.0 Hz, 1H), 6.794(t, <i>J</i> =8.0 Hz, 1H), 6.164(d, <i>J</i> =6.0 Hz, 1H), 6.124(s, 1H), 2.027 (s, 3H); MS(<i>m/e</i>): 332.2 (M+1).
287	4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	10.573(s, 1H), 9.162(s, 1H), 9.007(s, 1H), 8.985(s, 1H), 7.952(d, <i>J</i> =5.6Hz, 1H), 7.766(s,1H), 7.301(d, <i>J</i> =8Hz, 1H), 7.262(d, <i>J</i> =8Hz, 1H), 7.123(d, <i>J</i> =8Hz, 1H), 7.011(m, 1H), 6.332(dd, <i>J</i> =8,1.6Hz, 1H), 6.103(m, 2H), 2.391(s, 3H); MS(<i>m/e</i>): 331.4 (M+1)
289	4-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	8.133(d, <i>J</i> =6.0 Hz, 1H), 7.324(d, <i>J</i> =8.4 Hz, 1H), 7.225-7.183(m, 3H), 6.819 (dd, <i>J</i> =8.8 Hz, <i>J</i> =2.4 Hz, 1H), 6.533 (s, 1H), 6.530 (s, 1H), 6.213 (d, <i>J</i> =5.6 Hz, 1H), 6.172 (s, 1H), 2.428 (s, 3H); MS(<i>m/e</i>): 374.3 (M+1).
290	3-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페놀 	8.179(d, <i>J</i> =6.0 Hz, 1H), 7.333(d, <i>J</i> =8.8 Hz, 1H), 7.193(s, 1H), 7.095(s, 1H), 6.953(d, <i>J</i> =7.2 Hz, 1H), 6.902(t, <i>J</i> =8.0 Hz, 1H), 6.831(d, <i>J</i> =8.8 Hz, 1H), 6.387(d, <i>J</i> =7.6 Hz, 1H), 6.244(d, <i>J</i> =6.0 Hz, 1H), 6.171 (s, 1H), 3.332 (s, 3H), 2.454 (s, 3H); MS(<i>m/e</i>): 333.2 (M+1).
291	2-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	11.249(s, 1H), 8.943 (d, <i>J</i> =4.8 Hz, 1H), 7.920 (d, <i>J</i> =5.6 Hz,1H), 7.867 (m, <i>J</i> =6.4 Hz,2H), 7.128(d, <i>J</i> =8.0 Hz, 1H), 7.078(t, <i>J</i> =8.4-6.8 Hz,1H),6.797(s, 2H), 6.589 (s, 1H),6.217(s,1H) ,6.075(s,1H), 4.061(m, <i>J</i> =7.2-6.8 Hz,1H)2.406 (s, 3H); MS: 350.2(M+1).
292	4-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	11.212(s, 1H), 8.845(s, 1H), 8.689(d, <i>J</i> =10.0Hz,1H), 7.868 (d, <i>J</i> =5.6 Hz,2H), 7.427(d, <i>J</i> =8.4 Hz, 2H), 7.107(t, <i>J</i> =8.4-6.4Hz,1H),6.509(d, <i>J</i> =8.0 Hz, 2H), 6.208 (s, 1H),5.940(m, <i>J</i> =3.6-1.6 Hz,1H) , 4.060(m, <i>J</i> =7.2-6.8 Hz,1H),2.408 (s, 3H); MS(<i>m/e</i>): 350.2(M+1).

293	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)페놀 	11.217(s, 1H), 9.069(s, 1H), 8.836(s, 1H), 8.715(s, 1H), 7.922(d, $J=6.0$ Hz, 1H), 7.224 (d, $J=8.4$ Hz, 2H), 7.128(T, $J=6.4-2.4$ Hz, 2H), 6.839(t, $J=8.4-6.4$ Hz, 1H), 6.268(d, $J=1.6$ Hz, 2H), 6.249 (s, 1H), 6.207 (s, 1H), 4.043(m, $J=7.2-6.8$ Hz, 1H), 2.400 (s, 3H); MS(m/e): 350.2(M+1).
294	3-(4-(2-메틸벤조[d]옥사졸-6-일아미노)피리미딘-2-일아미노)페놀 	9.500 (s, 1H), 9.175 (s, 1H), 9.054 (s, 1H), 8.164 (s, 1H), 8.003 (d, $J=6.0$ Hz, 1H), 7.569 (m, 2H), 7.230 (m, 2H), 6.996 (dd, 1H), 6.338 (d, $J=8.0$ Hz, 1H), 7.239 (d, $J=6.0$ Hz, 1H), 2.607 (s, 3H). MS(m/e): 334.2 (M+1).
295	3-(4-(4-플루오로-2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)페놀 	MS (m/e): 351.4 (M+1)

실시예 296: N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민(화합물 296)의 합성:

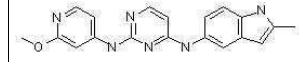


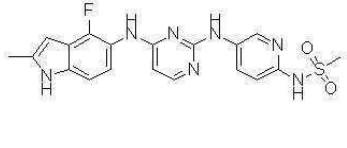
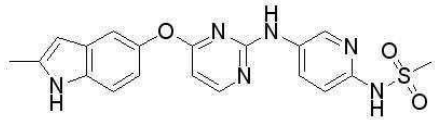
메탄올 10 ml에 용해된 2-클로로피리미딘-4-아민(1 mmol) 및 메톡시화 나트륨(1.5 mmol)의 용액은 2 시간 동안 환류되었고, 용매를 제거한 후에 잔류물은 CH_2Cl_2 에 용해되었고 물로 세척되었고, 무수 NaSO_4 상에서 건조되었고 진공 상태에서 농축되어 2-메톡시피리미딘-4-아민을 얻게 되었다.



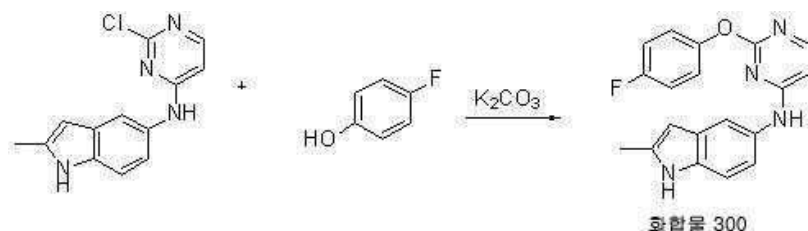
디옥사이드 3 ml에 용해된 2-메톡시피리미딘-4-아민(0.1 mmol) 및 N-(2-클로로피리미딘-4-일)-2-메틸-1H-인돌-5-아민(0.1 mmol)의 용액에 CsCO_3 (0.2 mmol), $\text{Pd}(\text{OAc})_2$ (10 mmol%) 및 잔트포스(Xantphos)(10 mmol%)이 첨가되었다. 혼합물은 200의 마이크로파 조사(microwave irradiation)하에서 40 분 동안 교반되었다. 냉각 후에, 상기 용액은 여과되었고 여과액은 진공 상태에서 농축되었으며, 잔류물은 칼럼 크로마토그래피로 정제되어 N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민을 얻게 되었다(수율 48%).

^1H NMR(DMSO- d_6 , 400MHz): 10.839(s, 1 H), 9.718 (s, 1 H), 9.281 (s, 1 H), 8.162 (d, , $J=6.0$ Hz, 1H), 8.032(m, 2H), 7.693 (s, 1H), 7.251 (d, , $J=8.8$ Hz, 1H), 7.099 (d, , $J=7.2$ Hz, 1H), 6.300 (d, , $J=6.0$ Hz, 1H), 6.107 (s, 1H), 3.863 (s, 3H), 2.383 (s, 3H); MS (m/e): 348.2 (M+1)

화합물	명칭	^1H NMR (DMSO- d_6 , 400 MHz)/MS
297	N-(2-메톡시피리미딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	10.837(s, 1 H), 9.421 (s, 1 H), 9.144 (s, 1 H), 7.978 (d, $J=6.0$ Hz, 1H), 7.838(d, $J=6.0$ Hz, 1H), 7.606 (s, 1H), 7.333-7.303 (m, 2H), 7.249 (d, $J=8.4$ Hz, 1H), 7.084 (d, $J=8.0$ Hz, 1H), 6.205(d, $J=5.6$ Hz, 1H), 6.088 (s, 1H), 3.775 (s, 3H), 2.382 (s, 3H); MS (m/e): 347.2 (M+1)

298	N-(2-메톡시피리딘-4-일)-N-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	11.258 (s, 1 H), 10.400 (br, 1 H), 9.036 (s, 1 H), 8.829 (s, 1 H), 8.509 (s, 1 H), 8.048 (d, $J=8.4$ Hz, 1H), 7.911 (d, $J=5.6$ Hz, 1H), 7.007-7.122 (m, 2H), 6.743 (dd, $J=8.4$ Hz, 1.6 Hz, 1H), 6.194 (s, 1H), 6.012 (br, 1H), 3.166 (s, 3H), 2.397 (s, 3H); MS (m/e): 428.1 (M+1)
299	N-5-(4-(2-메틸-1H-인돌-5-일옥시)피리미딘-2-일아미노)피리딘-2-일메탄술폰아미드 	MS (m/e): 411 (M+1)

[0063] 실시예 300: N-(2-(4-플루오로페녹시)피리미딘-4-일)-2-메틸-1H-인돌-5-아민(화합물 300)의 합성



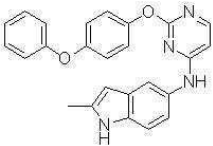
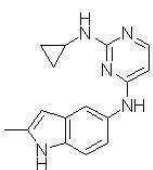
[0064]

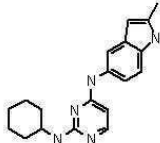
[0065] N-(2-클로로피리미딘-4-일)-2-메틸-1H-인돌-5-아민(0.1 mmol) 및 p-플루오로페놀(0.1 mmol)은 DMF 0.5 ml에 용해되었다. 여기에 K_2CO_3 가 첨가되었다(0.2 mmol). 60℃에서 5 시간 동안 교반된 이후에, 반응 혼합물은 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na_2SO_4 에 의해 건조되었으며 농축되었다. 그 결과 남은 유성 잔류물은 칼럼 크로마토그래피로 정제시켜 76% 수율의 화합물 300을 얻게 되었다.

[0066] 1H NMR (DMSO- d_6 , 400 MHz): d 10.802 (s, 1H), 9.491 (s, 1H), 7.990 (d, $J=5.4$ Hz 1H), 7.495 (s, 1H), 7.295 (m, $J=8.4-3.6$ Hz, 4H), 7.236 (d, $J=5.4$ Hz 1H), 7.133 (d, $J=5.6$ Hz, 1H), 6.486 (d, $J=5.6$ Hz, 1H), 5.902 (s, 1H), 2.402 (s, 3H); MS (m/e): 335.1 (M+1).

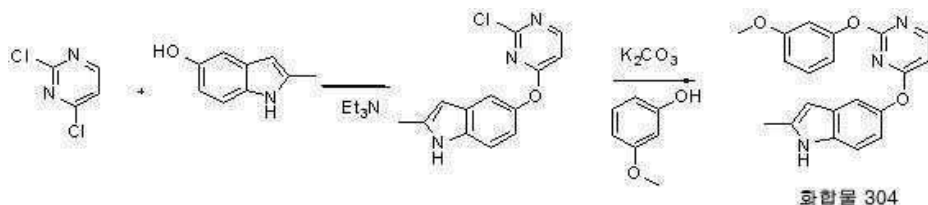
[0067] 실시예 301 내지 303: 화합물 301 내지 303의 합성

[0068] 화합물 301 내지 303은 실시예 300에 기술된 것과 유사한 방식으로 제조되었다.

화합물	명칭	1H NMR (CD $_3$ OD, 400 MHz)/MS
301	2-메틸-N-(2-(4-페녹시페녹시)피리미딘-4-일)-1H-인돌-5-아민 	11.190 (s, 1H), 9.046 (s, 1H), 7.959 (s, 1H), 7.931 (d, $J=6.0$ Hz, 1H), 7.681 (d, $J=7.2$ Hz, 2H), 7.361 (t, $J=8.0-7.6$ Hz, 2H), 7.114 (m, $J=8.4-7.2$ Hz, 3H), 6.903 (d, $J=8.0$ Hz, 2H), 6.755 (d, $J=7.2$ Hz, 2H), 6.179 (s, 1H), 6.024 (s, 1H), 2.338 (s, 3H); MS(m/e): 409.2 (M+1)
302	N2-사이클로프로필-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	7.739 (d, $J=6.4$ Hz, 1H), 7.593 (s, 1H), 7.252 (d, $J=7.6$ Hz, 1H), 7.119 (d, $J=8.0$ Hz, 1H), 6.009 (s, 1H), 6.016 (d, $J=6.0$ Hz, 1H), 2.425 (s, 3H), 0.784 (m, $J=5.2-2.4$, 2H), 0.626 (m, $J=2.0-0.8$ Hz, 3H), 0.547 (m, $J=2.0-1.2$ Hz, 3H). MS(m/e): 280.2 (M+1)

303	N2-사이클로헥실-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민 	MS (m/e): 322.3 (M+1)
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[0070] 실시예 304: 5-(2-3(-메톡시페녹시)피리미딘-4-일옥시)-2-메틸-1H-인돌(화합물 304)의 합성



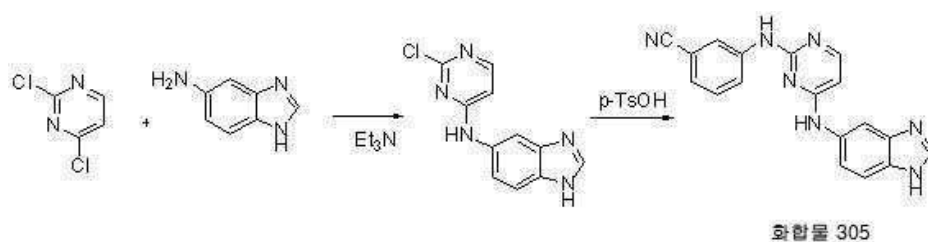
[0071]

[0072] EtOH 5 ml에 용해된 2,4-디클로로피리미딘(1 mmol) 및 5-히드록시-2-메틸인돌(1 mmol) 용액에 Et₃N(1 mmol)이 첨가되었다. 반응 혼합물은 5 시간 동안 환류되었다. 진공 상태에서 용매를 제거하고 H₂O를 첨가한 후에, 상기 혼합물은 EtOAc로 추출되었다. 유기층들은 혼합되며, 포화 NaCl 수용액으로 세척되며, 무수 Na₂SO₄ 상에서 건조된 후 진공 상태에서 농축되었다. 그 결과 남은 유성 잔류물은 칼럼 크로마토그래피로 정제시켜 75% 수율의 5-(2-클로로피리미딘-4-일옥시)-2-메틸-1H-인돌을 얻었다.

[0073] 5-(2-클로로피리미딘-4-일옥시)-2-메틸-1H-인돌(0.1 mmol) 및 메톡시페놀(0.1 mmol)은 DMF 0.5 ml에 용해되었다. 여기에 K₂CO₃(0.2 mmol)이 첨가되었다. 반응 혼합물은 60℃에서 5 시간 동안 교반된 후에 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 정제되지 않은 생성물은 칼럼 크로마토그래피로 정제시켜 76% 수율의 생성물을 얻게 되었다.

[0074] ¹H NMR (CD₃OD, 400 MHz): d 8.303 (d, J=5.6 Hz, 1H), 8.084 (s, 1H), 7.305-7.262 (m, 3H), 6.908 (dd, J=8.8 Hz, J=2.4 Hz, 1H), 6.816-6.764 (m, 3H), 6.463 (d, J=5.6 Hz, 1H), 6.226 (s, 1H), 3.780 (s, 3H), 2.465 (s, 3H); MS (m/e): 346.5 (M-1).

[0075] 실시예 305: 3-(4-(2-메틸-1H-인돌-5-일아미노)피리미딘-2-일아미노)벤조니트릴(화합물 305)의 합성



[0076]

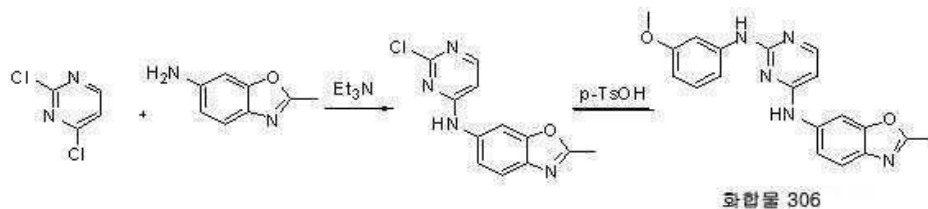
[0077] Et₃N (1 mmol)은 2,4-디클로로피리미딘(1 mmol) 및 5-아미노벤조이미다졸(1 mmol)을 EtOH 5 ml에 용해시킨 용액에 첨가되었다. 반응 혼합물은 5 시간 동안 환류되었다. 진공 상태에서 용매를 제거하고 H₂O를 첨가한 후에, 상기 혼합물은 EtOAc로 추출되었다. 유기층들은 혼합되며, 포화 NaCl 수용액으로 세척되며, 무수 Na₂SO₄ 상에서 건조된 후 진공 상태에서 농축되었다. 잔류물은 칼럼 크로마토그래피로 정제시켜 80% 수율의 N-(2-클로로피리미딘-4-일)-1H-벤조[d]이미다졸-5-아민을 얻었다.

[0078] N-(2-클로로피리미딘-4-일)-1H-벤조[d]이미다졸-5-아민(0.1 mmol), 3-아미노벤조니트릴(0.1 mmol) 및 p-TsOH 모노하이드레이트(0.2 mmol)은 DMF 0.5 ml에 용해되었다. 반응 혼합물은 60℃에서 5 시간 동안 교반된 후에, 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 그 결과 생성된 오일은 칼럼 크로마토그래피로 정제시켜 76% 수율의 화합물 305

를 얻게 되었다.

[0079] ^1H NMR (CD_3OD , 400 MHz): d 8.178 (s, 1H), 7.942 (d, $J=6.4\text{Hz}$, 2H), 7.825 (br, 1H), 7.633-7.603 (m, 2H), 7.469 (dd, $J=8.8\text{Hz}$, 5Hz, 1H), 7.212 (t, $J=8.4\text{ Hz}$, 1H), 7.075 (d, $J=8.0\text{Hz}$, 1H), 6.254 (d, $J=6.0\text{ Hz}$, 1H), 3.345 (s, 1H); MS: 327.2 (M+1).

[0080] 실시예 306: N2-(3-메톡시페닐)-N4-(2-메틸벤조[d]옥사졸-6-일)피리미딘-2,4-디아민(화합물 306)의 합성



[0081]

[0082] Et_3N (1 mmol)은 2,4-디클로로피리미딘(1 mmol) 및 2-메틸-1,3-벤조옥사졸-5-아민(1 mmol)을 EtOH 5 mL에 용해시킨 용액에 첨가되었다. 반응 혼합물은 5 시간 동안 환류되었다. 진공 상태에서 용매를 제거하고 H_2O 를 첨가한 후에, 상기 혼합물은 EtOAc로 추출되었다. 유기층들은 혼합되며, 포화 NaCl 수용액으로 세척되며, 무수 Na_2SO_4 상에서 건조된 후 진공 상태에서 농축되었다. 잔류물은 칼럼 크로마토그래피로 정제시켜 73% 수율의 N-(2-클로로피리미딘-4-일)-2-메틸벤조[d]옥사졸-6-아민을 얻었다.

[0083] N-(2-클로로피리미딘-4-일)-2-메틸벤조[d]옥사졸-6-아민(0.1 mmol), 3-메톡시아닐린(0.1 mmol) 및 p-TsOH 모노하이드레이트(0.2 mmol)은 DMF 0.5 mL에 용해되었다. 반응 혼합물은 60°C 에서 5 시간 동안 교반된 후에, 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na_2SO_4 상에서 건조되었으며 농축되었다. 그 결과 생성된 오일 잔류물은 칼럼 크로마토그래피로 정제시켜 82% 수율의 화합물 306을 얻게 되었다.

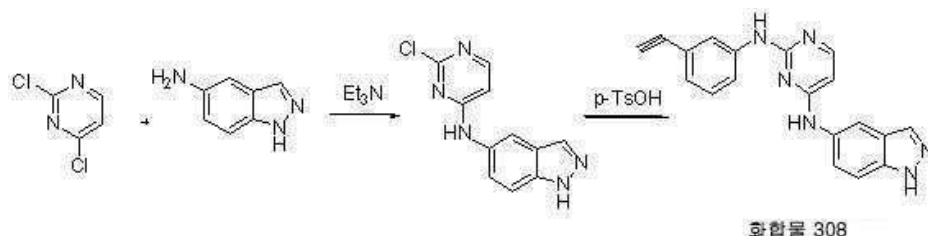
[0084] ^1H NMR ($\text{DMSO}-d_6$, 400 MHz): d 9.431 (s, 1H), 9.158 (s, 1H), 8.136 (s, 1H), 8.022 (d, $J=5.6\text{ Hz}$, 1H), 7.566 (d, $J=8.8\text{ Hz}$, 1H), 7.517 (d, $J=8.8\text{ Hz}$, 1H), 7.418 (s, 1H), 7.367 (d, $J=8.0\text{ Hz}$, 1H), 7.126 (t, $J=8.4\text{ Hz}$, 1H), 6.490 (m, 1H), 6.224 (d, $J=5.2\text{ Hz}$, 1H), 3.674 (s, 3H), 2.609 (s, 3H); MS(m/e): 348.3 (M+1).

[0085] 실시예 307: N2-(3-에티닐페닐)-N4-(2-메틸벤조[d]옥사졸-6-일)피리미딘-2,4-디아민(화합물 307)의 합성.

[0086] 화합물 307은 실시예 306에 기술된 것과 유사한 방식으로 합성되었다.

[0087] ^1H NMR ($\text{DMSO}-d_6$, 400 MHz): d 9.566 (d, $J=5.2\text{ Hz}$, 1H), 9.309 (s, 1H), 8.099 (s, 1H), 8.038 (d, $J=6.0\text{ Hz}$, 1H), 7.917 (s, 1H), 7.805 (d, $J=8.4\text{ Hz}$, 1H), 7.574 (m, 2H), 7.231 (m, 1H), 6.996 (d, $J=7.6\text{ Hz}$, 1H), 7.278 (d, $J=5.6\text{ Hz}$, 1H), 4.059 (s, 1H), 2.608 (s, 3H); MS(m/e): 342.2 (M+1).

[0088] 실시예 308: N2-(3-에티닐페닐)-N4-(1H-인다졸-6-일)피리미딘-2,4-디아민(화합물 308)의 합성



[0089]

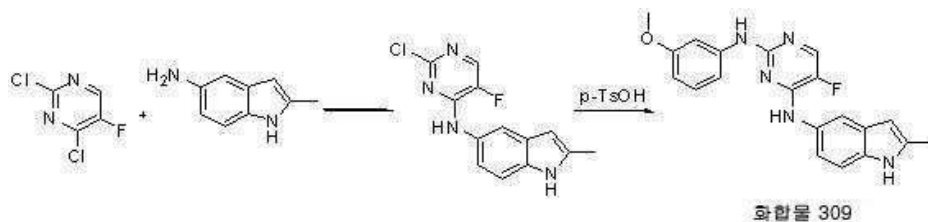
[0090] Et_3N (1 mmol)은 2,4-디클로로피리미딘(1 mmol) 및 5-아미노인다졸(1 mmol)을 EtOH 5 mL에 용해시킨 용액에 첨가되었다. 반응 혼합물은 5 시간 동안 환류되었다. 진공 상태에서 용매를 제거하고 H_2O 를 첨가한 후에, 상기 혼합물은 EtOAc로 추출되었다. 유기층들은 혼합되며, 포화 NaCl 수용액으로 세척되며, 무수 Na_2SO_4 상에서 건조된 후 진공 상태에서 농축되었다. 그 결과 생성된 오일은 칼럼 크로마토그래피로 정제시켜 80% 수율의 N-(2-클로로

피리미딘-4-일)-1H-인다졸-5-아민을 얻었다.

[0091] N-(2-클로로피리미딘-4-일)-1H-인다졸-5-아민(0.1 mmol), 3-에티닐아닐린(0.1 mmol) 및 p-TsOH(0.2 mmol, 모노하이드레이트)은 DMF 0.5 ml에 용해되었다. 반응 혼합물은 60℃에서 5 시간 동안 교반된 후에, 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 잔류물은 칼럼 크로마토그래피로 정제시켜 74% 수율의 화합물 308을 얻게 되었다.

[0092] ¹H NMR (DMSO-d₆, 400 MHz): d 12.966 (brs, 1H), 9.344 (brs, 1H), 9.234 (brs, 1H), 8.145 (s, 1H), 8.005 (m, 2H), 7.893 (s, 1H), 7.795 (d, 1H), 7.527 (d, J=8.8 Hz, 1H), 7.471 (d, J=8.8 Hz, 1H), 7.212 (t, 1H), 7.021 (d, 1H), 6.626 (d, 1H), 4.037 (s, 1H); MS (m/e): 327.2 (M+1).

[0093] 실시예 309: N2-(3-메톡시페닐)-N4-(2-메틸-1H-인돌-5-일)피리미딘-2,4-디아민(화합물 309)의 합성



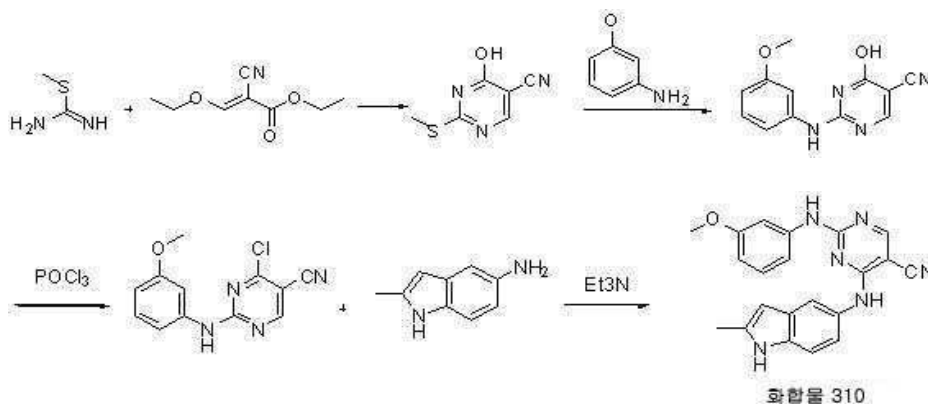
[0094]

[0095] 2,4-디클로로-5-플루오로피리미딘(1 mmol) 및 5-아미노-2-메틸인돌(1.5 mmol)은 CH₃OH 3 ml 및 H₂O 9 ml에 용해되었다. 반응 혼합물은 상온에서 1 시간 동안 교반된 후에, H₂O로 희석되었고, 2N HCl로 산성화되었으며 초음파 처리되었다. 이후, 상기 반응 혼합물은 여과되고, H₂O로 세척되었으며 건조되어 78% 수율의 N-(2-클로로-5-플루오로피리미딘-4-일)-2-메틸-1H-인돌-5-아민을 얻게 되었다.

[0096] N-(2-클로로-5-플루오로피리미딘-4-일)-2-메틸-1H-인돌-5-아민(0.1 mmol), m-메톡시아닐린(0.1 mmol) 및 p-TsOH 모노하이드레이트(0.2 mmol)는 DMF 0.5 ml에 용해되었다. 반응 혼합물은 60℃에서 5 시간 동안 교반된 후에, 물로 희석되었으며 아세트산 에틸로 추출되었다. 유기층은 물과 식염수로 순차적으로 세척되었고, 무수 Na₂SO₄ 상에서 건조되었으며 농축되었다. 잔류물은 칼럼 크로마토그래피로 정제시켜 60% 수율의 화합물 309를 얻게 되었다.

[0097] ¹H NMR (CD₃OD, 400 MHz, d ppm): 7.854 (d, J=4.0 Hz, 1H), 7.703 (d, J=1.6, 1H), 7.248 (s, 2H), 7.177 (br, 2H), 7.054 (t, J=4.2 Hz, 2H), 6.942 (s, 2H), 3.506 (s, 3H), 2.235 (s, 3H); MS(m/e): 364.2 (M+1).

[0098] 실시예 310: 2-(3-메톡시페닐아미노)-4-(2-메틸-1H-인돌-5-일아미노)피리미딘-5-카르보니트릴(화합물 310)의 합성



[0100]

[0101] 2-메틸-2-티오슈도우레아(5 mmol) 및 에틸 에톡시메틸렌시아노아세테이트(5 mmol)은 DMF 20 ml에 용해되었다. 여기에 K₂CO₃(0.2 mmol)가 첨가되었다. 혼합물이 48 시간 동안 환류된 후에, 상온에서 냉각되고 여과되었다. 용매는 진공 상태에서 농축되었으며 칼럼 크로마토그래피로 정제시켜 85% 수율의 4-히드록시-2-(메틸티오)피리미딘-5-카르보니트릴을 얻게 되었다.

[0102] 펜탄-1-올에 용해된 4-히드록시-2-(메틸티오)피리미딘-5-카르보니트릴(3 mmol) 및 m-아니시딘(3 mmol) 질소 분위기에서 40 시간 동안 환류되었다. 반응 혼합물은 진공 상태에서 농축되었다. 잔류물은 물로 세척되고 건조시켜 4-히드록시-2-(3-메톡시페닐아미노)피리미딘-5-카르보니트릴을 생성하였다.

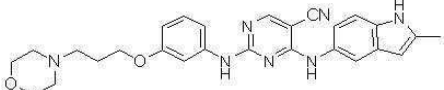
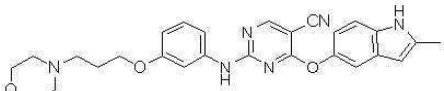
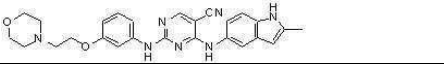
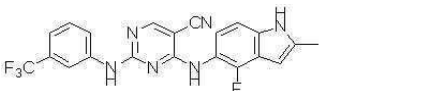
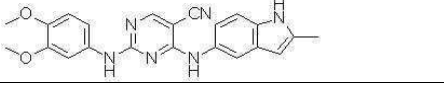
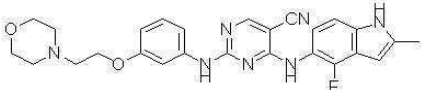
[0103] DMF 0.5 ml는 4-히드록시-2-(3-메톡시페닐아미노)피리미딘-5-카르보니트릴을 POC_l₃에 용해시킨 용액에 첨가되었다. 상기 용액은 3 시간 동안 환류되었다. 반응 혼합물은 상온에서 냉각되어 얼음물에 부어졌다. 상기 용액은 수용성 탄산 나트륨용액에 의하여 pH=8-9로 조절되었으며 디클로로메탄으로 추출되었다. 혼합된 유기층들은 식염수로 세척되며, 무수 Na₂SO₄ 상에서 건조된 후 진공 상태에서 농축되어 4-클로로-2-(3-메톡시페닐아미노)피리미딘-5-카르보니트릴을 생성하였다.

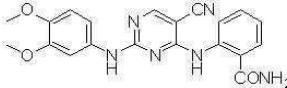
[0104] 4-클로로-2-(3-메톡시페닐아미노)피리미딘-5-카르보니트릴은 실시예 1에 기술된 것과 유사한 방식으로 310으로 변환되었다.

[0105] ¹H NMR (DMSO-d₆, 400 MHz): d 10.925(s, 1H), 9.710 (d, J=11.2 Hz, 1H), 9.349 (d, J=10.4 Hz, 1H), 8.441 (s, 1H), 7.474 (s, 1H), 7.252 (s, 1H), 7.223 (d, J=6.8 Hz, 1H), 7.187 (s, 1H), 7.062 (m, J= 1H), 6.923 (d, J=2.0 Hz, 1H), 6.485 (t, 1H); 6.098 (s, 1H), 3.453 (s, 3H), 2.387 (s, 3H); MS(m/e): 371.2 (M+1).

[0106] 실시예 311 내지 317: 화합물 311 내지 317의 합성

[0107] 화합물 311 내지 317은 실시예 310에 기술된 것과 유사한 방식으로 제조되었다.

화합물	명칭/구조	¹ HNMR(DMSO-d ₆ , 400Hz)/ MS
311	4-(2-메틸-1H-인돌-5-일아미노)-2-(3-(3-모르폴리노프로폭시)페닐아미노)피리미딘-5-카르보니트릴 	11.184 (s, 1H), 10.745 (s, 1H), 9.492 (s, 1H), 8.396 (s, 1H), 7.322 (s, 1H), 7.292 (d, J=7.2, 1H), 7.147 (m, 1H), 6.919 (m, 1H), 6.815 (d, J=8.8, 1H), 6.416 (d, J=7.2, 1H), 6.261 (t, J=4.8, 1H), 6.129 (s, 1H), 3.447 (m, 2H), 3.547 (m, 4H), 2.398 (s, 3H), 2.337 (m, 6H), 1.747 (m, 2H). MS (m/e): 484.2 (M+1)
312	4-(2-메틸-1H-인돌-5-일옥시)-2-(3-(3-모르폴리노프로폭시)페닐아미노)피리미딘-5-카르보니트릴 	MS (m/e): 485.3 (M+1)
313	4-(2-메틸-1H-인돌-5-일아미노)-2-(3-(2-모르폴리노에톡시)페닐아미노)피리미딘-5-카르보니트릴 	MS (m/e): 470.5 (M+1)
314	4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)-2-(3-(트리플루오로메틸)페닐아미노)피리미딘-5-카르보니트릴 	MS (m/e): 472.2 (M+1)
315	2-(3,4-디메톡시페닐아미노)-4-(2-메틸-1H-인돌-5-일아미노)피리미딘-5-카르보니트릴 	MS (m/e): 488.5 (M+1)
316	4-(4-플루오로-2-메틸-1H-인돌-5-일아미노)-2-(3-(2-모르폴리노에톡시)페닐아미노)피리미딘-5-카르보니트릴 	MS (m/e): 488.5 (M+1)

317	<p>2-(5-시아노-2-(3,4-디메톡시페닐아미노)피리미딘-4-일아미노)벤즈아미드</p> 	MS (m/e): 391.1 (M+1)
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- [0109] 실시예 318: Z'-라이트(lyte) 키나아제 검사 키트를 사용한 KDR 키나아제 활성 검사
- [0110] 재조합 KDR 촉매 도메인(Invitrogen, Carlsbad, CA, U.S.A., PV3660)의 키나아제 활성의 억제제는 흑색 384-웰 플레이트(Thermo labsystems, Cambridge, U.K., Cat. 7805)에서 Z'-LYTE™ Tyr1 Peptide 검사 키트(Invitrogen, Cat. PV3190)을 사용하여 측정되었다. 상기 검사는 제작자가 추천한 절차에 따라 수행되었다.
- [0111] 요약하면, 시험 화합물(DMSO에 용해된 10 mM 스탁)이 8% DMSO를 함유하는 증류수로 1:4의 비율로 희석되었다. 상기 용액은 시험 웰 및 3 개의 대조 웰들(C1, C2 및 C3)에 웰당 2.5 μ l의 농도로 두었다. 쿠마린-플루오르세인(Coumarin-fluorescein) 이중-라벨된 펩티드 기질은 상기 KDR 촉매 도메인("키나아제")와 혼합되었다. 상기 키나아제/펩티드 혼합물 5 μ l씩을 상기 시험 웰, C1 웰 및 C2 웰에 첨가하였지만, C3에는 첨가하지 않았다(최종 농도: 키나아제 웰당 0.3 μ g, 펩티드 2 μ M). Phosphor-Tyr1 펩티드 5 μ l을 상기 C3 웰에 첨가하였다. 40 μ M ATP 2.5 μ l를 상기 시험 웰 및 C2 웰에 첨가하고 1.33 x 키나아제 완충액(1 x 완충액: 50 mM HEPES, pH7.5, 0.01% Brij-35, 5 mM MgCl₂, 5 mM MnCl₂ 및 1 mM EGTA)은 상기 C1 웰 및 C3 웰에 첨가하였다. 상기 플레이트는 1000 rpm으로 짧은 시간 동안 회전시켜 모든 용액을 상기 웰들의 바닥에 가라앉게 하였으며 이후 밀봉하여 25℃에서 250 rpm으로 1 시간 동안 교반하였다.
- [0112] 현상액(development reagent)은 제작자 추천에 따라 1:128의 비율로 희석되었다. 상기 희석된 현상액 5 μ l을 각각의 웰에 첨가하였다. 상기 플레이트는 1000 rpm으로 회전시켜 모든 용액을 상기 웰들의 바닥에 가라앉게 하였으며 이후 밀봉하여 25℃에서 250 rpm으로 1 시간 동안 교반하였다.
- [0113] 반응 중단제(stop reagent) 5 μ l를 각각의 웰에 첨가하였다. 상기 플레이트는 1000 rpm으로 회전시켜 모든 용액을 상기 웰들의 바닥에 가라 앉게 하였으며 이후 밀봉하여 25℃에서 250 rpm으로 2 분 동안 교반하였다. 각각의 웰에서의 상기 용액의 방출은 여기(Excitation) 400 nm/방출 445 nm 및 520 nm에서 Victor™3 마이크로 플레이트 판독기에 의하여 측정되었다. 방출비 및 인산화("Phos") 백분율은 하기 방정식에 의하여 계산되었다:

[0114]

$$\text{방출비} = \frac{\text{쿠마린방출}(445 \text{ nm})}{\text{플루오세인방출}(520 \text{ nm})}$$

$$\text{인산화백분율}\% = 1 - \frac{(\text{방출비} \times F_{100\%}) - C_{100\%}}{(C_{0\%} - C_{100\%}) + [\text{방출비} \times (F_{100\%} - F_{0\%})]}$$

[0115]

[0116] 여기서,

[0117] C_{100%} = 100% Phos. 대조군의 평균 쿠마린 방출 신호

[0118] C_{0%} = 0% Phos. 대조군의 평균 쿠마린 방출 신호

[0119] F_{100%} = 100% Phos. 대조군의 평균 플루오세인 방출 신호

[0120] F_{0%} = 0% Phos. 대조군의 평균 플루오세인 방출 신호

[0121] 억제율은 하기와 같이 계산된다:

[0122] 억제율% = (C2 웰에서의 Phos. - 시험 웰에서의 Phos.)/(C2 웰에서의 Phos.)x100%

[0123] 결과에 의하면 모든 시험 화합물들은 KDR 활성을 억제한 것으로 나타났다. IC₅₀ 수치들은 0.001 내지 10 μ M에 이르렀다.

[0124] 다른 실시예

[0125] 본 명세서에 기술된 모든 특징은 어떠한 조합도 이룰 수 있다. 본 명세서에 기술된 각 특징은 동일하거나 동등한 또는 유사한 목적을 가진 대체성 특징으로 대체될 수 있다. 따라서 별도의 설명이 없는 한, 기술된 각 특징은 단지 일련의 동등하거나 유사한 특징들 중의 일례일 뿐이다.

[0126] 앞서 기술한 내용으로부터, 당업자는 본 발명의 본질적인 특징을 쉽게 확인할 수 있으며, 본 발명의 취지 및 범위를 벗어나지 않는 한도 내에서 다양한 용도 및 조건에 맞추어서 본 발명에 다양한 변화 및 수정을 가할 수 있다. 예를 들면, 본 발명의 화합물과 구조적으로 동종류인 화합물을 만들어서, 이를 본 발명을 실행하는데 사용할 수 있다. 따라서 다른 실시예도 본 발명의 청구범위 내에 포함된다.