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(54) Title **BENZOIMIDAZOL-1,2-YL AMIDES AS Kv7 CHANNEL ACTIVATORS**

(56) References Cited:

WO-A1-96/01833, WO-A1-2009/085230, US-A1- 2003 109 549, WO-A1-2010/051819, EP-A1- 2 218 718, WO-A1-2010/080503, US-A1- 2011 124 858, WO-A1-2004/108712, WO-A1-2012/004698, US-B2- 6 855 714, WO-A1-2012/018668

DING KEJIA ET AL: "Aryl-substituted aminobenzimidazoles targeting the hepatitis C virus internal ribosome entry site", BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, vol. 24, no. 14, 14 May 2014 (2014-05-14), pages 3113-3117, XP029033865, ISSN: 0960-894X, DOI: 10.1016/J.BMCL.2014.05.009

DATABASE PUBCHEM [Online] 24 January 2012 XP055417771 Retrieved from 131669753, accession no. N N N Y

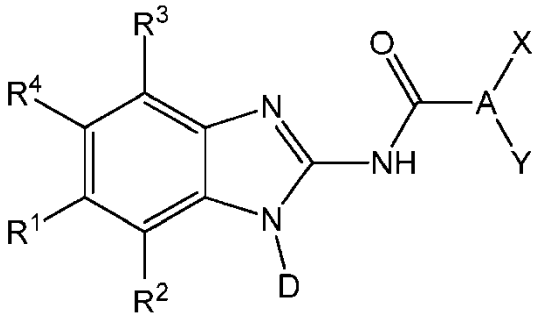
DATABASE PUBCHEM [Online] 18 June 2017 XP055417751 Retrieved from 128950369

SURESHBABU DADIBOYENA ET AL: "Parallel Synthesis of Aminobenzimidazole-Tethered Thiazoles", SYNTHESIS, vol. 2012, no. 02, 15 December 2011 (2011-12-15), pages 215-218, XP055437425, STUTTGART, DE. ISSN: 0039-7881, DOI: 10.1055/s-0031-1289644

Enclosed is a translation of the patent claims in Norwegian. Please note that as per the Norwegian Patents Acts, section 66i the patent will receive protection in Norway only as far as there is agreement between the translation and the language of the application/patent granted at the EPO. In matters concerning the validity of the patent, language of the application/patent granted at the EPO will be used as the basis for the decision. The patent documents published by the EPO are available through Espacenet (http://worldwide.espacenet.com) or via the search engine on our website here: https://search.patentstyret.no/

Patentkrav

1. Forbindelse representert ved formelen:



hvor D er eventuelt substituert cyklobutyl, eventuelt substituert fenyl, eventuelt substituert isoksazolyl, eventuelt substituert pyridinyl, isopropyl eller t-butyl;

A er C_{2-8} alkyl;

X er H, F, CF_3, eventuelt substituert fenyl eller eventuelt substituert pyridinyl;

Y er H, F, Cl, Br, I, CF_3, OH, C_{1-5} O-alkyl, C_{0-6} alkylamino eller C_{0-6} fluoralkylamino;

R^1 er H, F, Cl, Br, CN, OCH_3, CHF_2, CF_3, C_{1-4} -CO2-alkyl, C_{1-4} alkyl, $-CH_2CO_2H$,-$CH_2CO_2CH_2CH_3$ eller $-CH_2CON(CH_3)_2$ eller C_{1-4} hydroksyalkyl;

R^2 er H, F, Cl, Br, I, $-CH_2OH$, $-CO_2Me$ eller $-C(CH_3)_2OH$;

R^3 er H, F, Cl, Br eller I;

R^4 er H, F, Cl, Br, I, $-CH_3$ eller $-CF_3$; og

hvor de eventuelle substituenter på D og X uavhengig er valgt fra F, Cl, Br, I, CN, NO_2, C_{1-4} alkyl, C_{1-4} alkyl-OH, C_{1-3} O-alkyl, CF_3, COH, C_{1-4} CO-alkyl, CO_2H, C_{1-4} CO_2-alkyl, NH_2, C_{1-4} alkylamino, C_{1-6} fluoralkyl eller C_{1-6} fluoralkoksy.

2. Forbindelse ifølge krav 1, hvor Y er H, F, CF_3, OH, C_{1-5} O-alkyl, C_{0-6} alkylamino eller C_{0-6} fluoralkylamino.

3. Forbindelse ifølge krav 1, hvor R^1 er Cl, Br, $-OCH_3$, -CN, $-CF_3$, $-CH_2OH$, $-COOCH_2CH_3$, $-C(CH_3)_2OH$, $-CHOHCH_2CH_3$, $-CHOHCH_3$, $-CHF_2$, $-CH(CH_3)_2$, $-CH_2COOCH_2CH_3$, $-CH_2C(CH_3)_2OH$, $-CH_2COOH$ eller $-CH_2CON(CH_3)_2$.

4. Forbindelse ifølge krav 1, hvor R^2 er H, F, $-CH_2OH$, $-CO_2Me$ eller $-C(CH_3)_2OH$.

5. Forbindelse ifølge krav 1, hvor R^3 er H og R^4 er H, $-CH_3$ eller $-CF_3$.

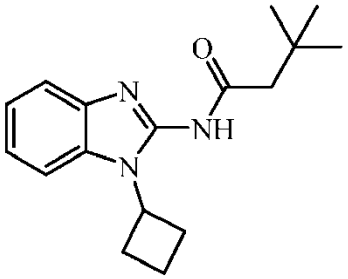
6. Forbindelse ifølge krav 1, hvor R^1 er Cl, Br, CN, OCH_3, CF_3, $-CO_2CH_2CH_3$, C_{1-4} alkyl eller C_{1-4} hydroksyalkyl.

7. Forbindelse ifølge krav 1, hvor X er eventuelt substituert fenyl eller eventuelt substituert pyridinyl.

8. Forbindelse ifølge krav 1, hvor X er H eller CF_3.

9. Forbindelse ifølge krav 1, hvor Y er H eller OH.

10. Forbindelse ifølge krav 1 representert ved formelen:



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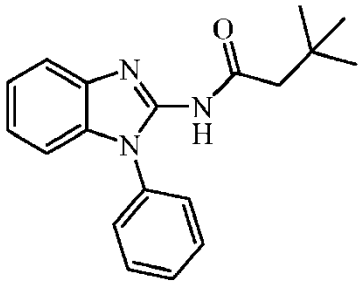

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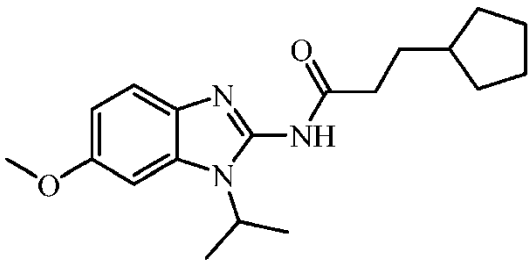

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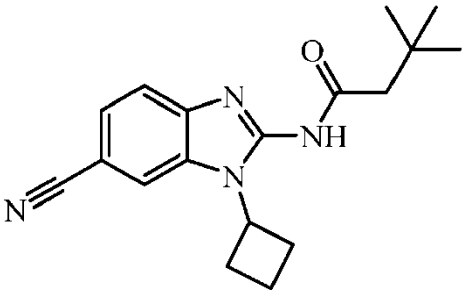

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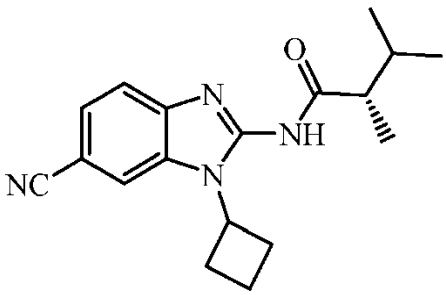

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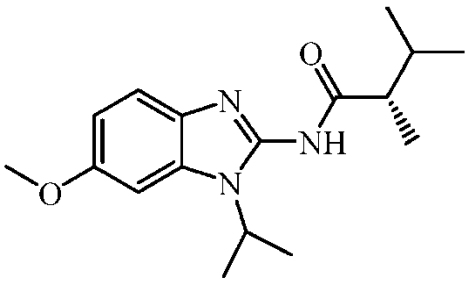

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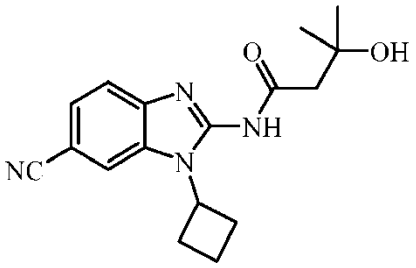
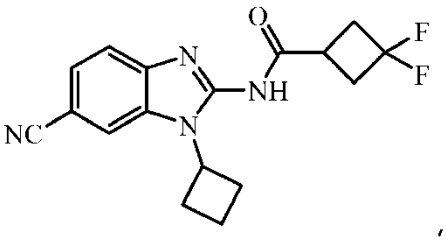
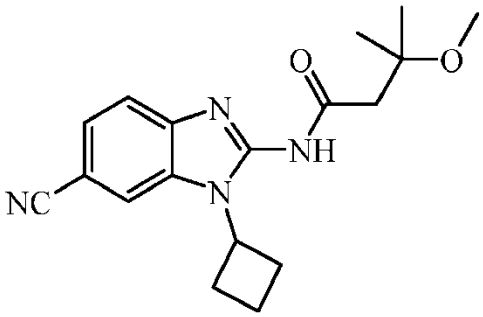
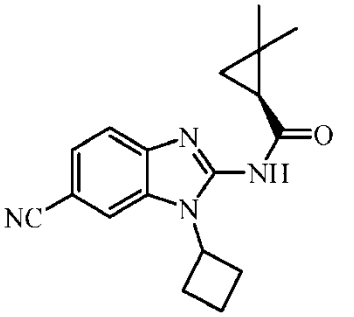
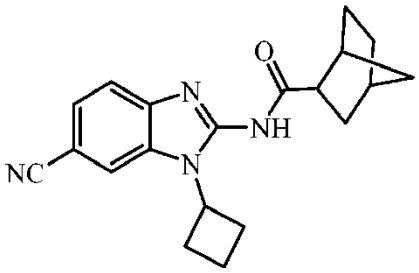
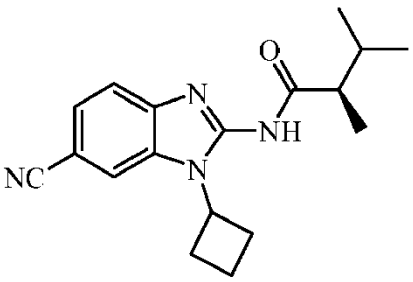
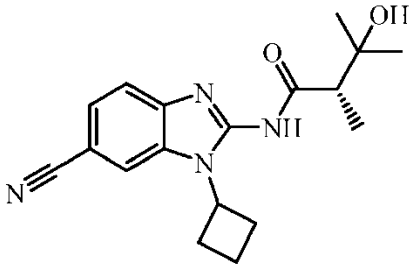
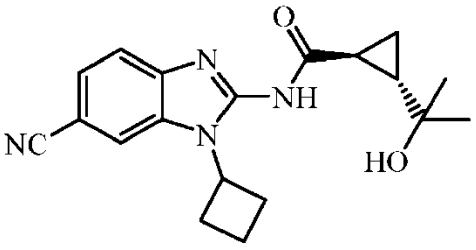
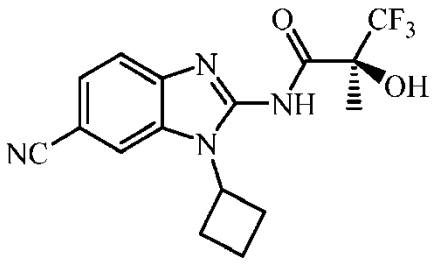
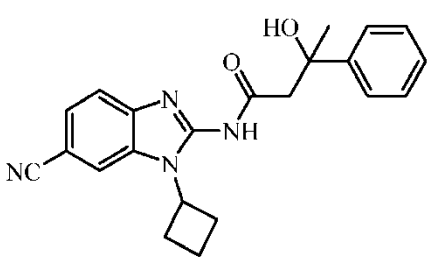

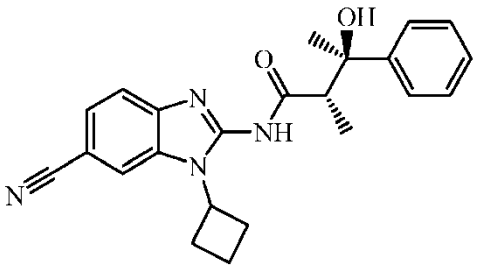

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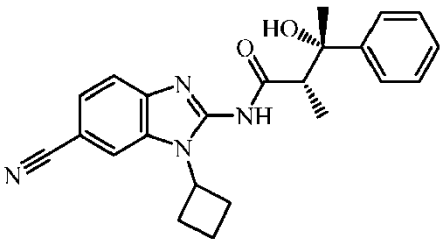

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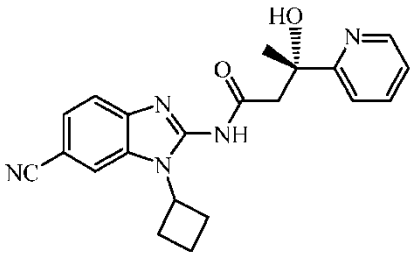

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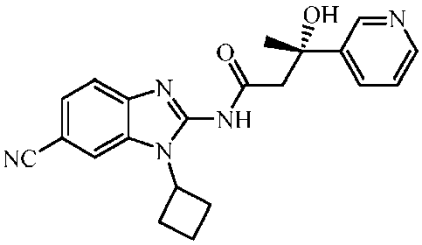

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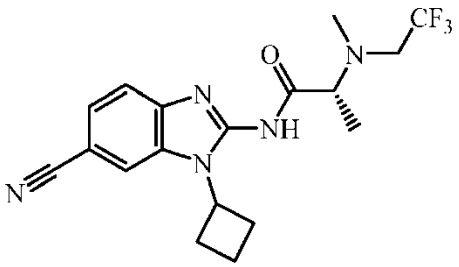

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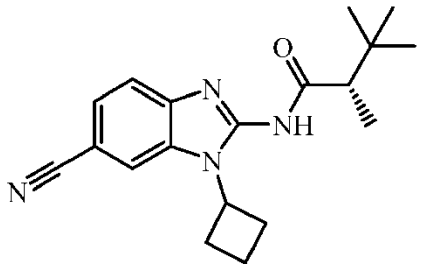

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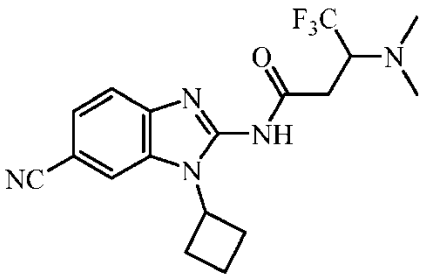

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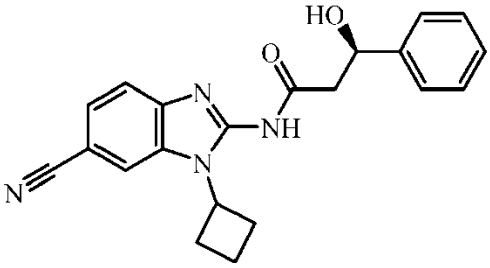

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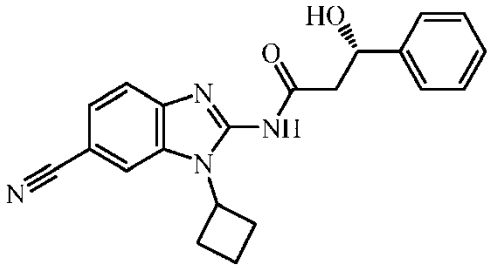

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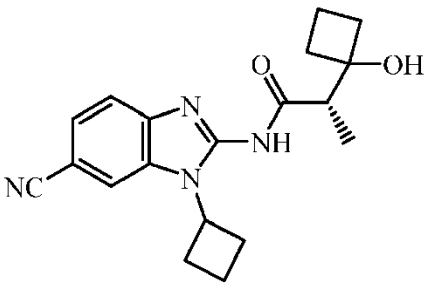

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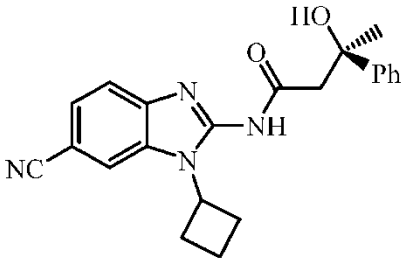
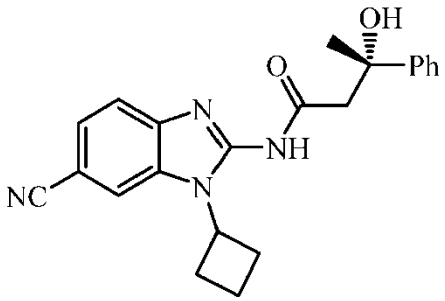
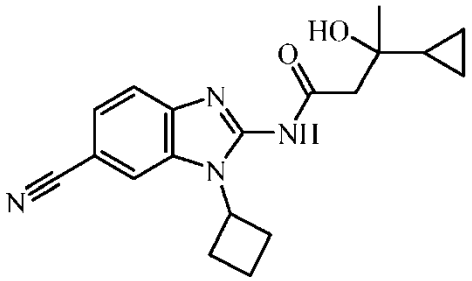
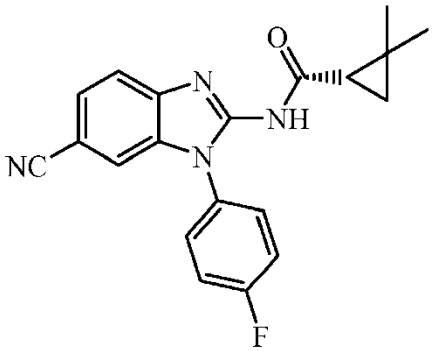
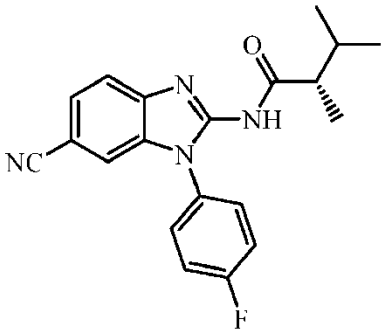
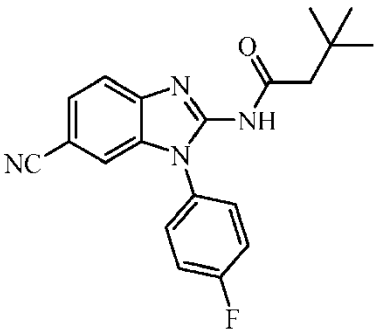
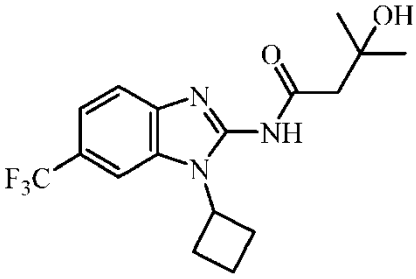
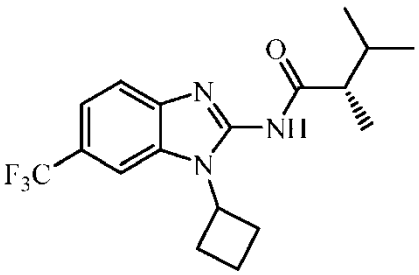

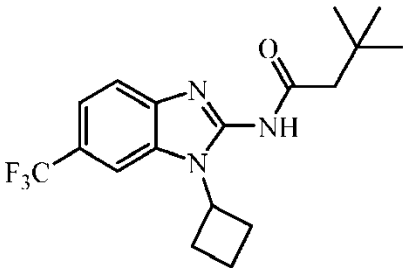

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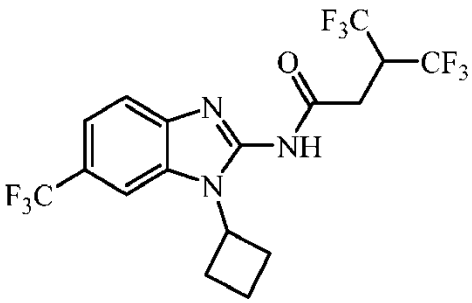

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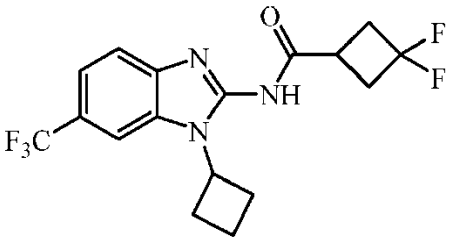

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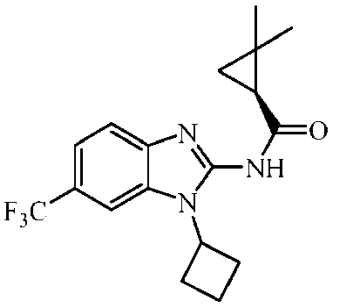

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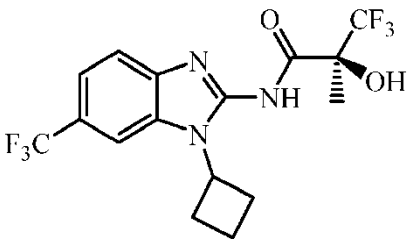

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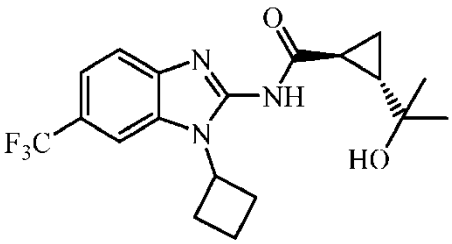

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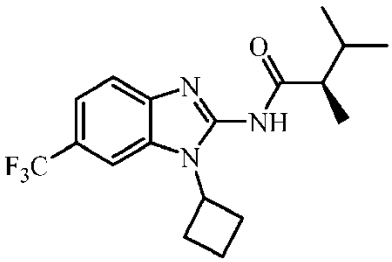

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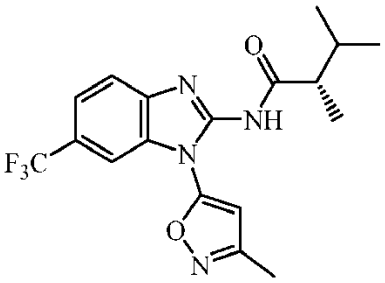

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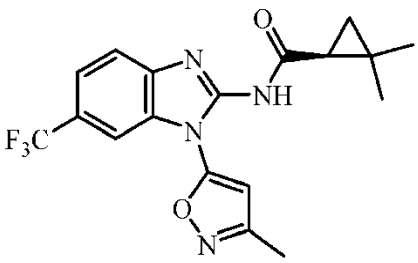

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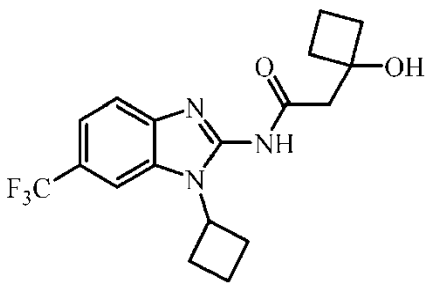

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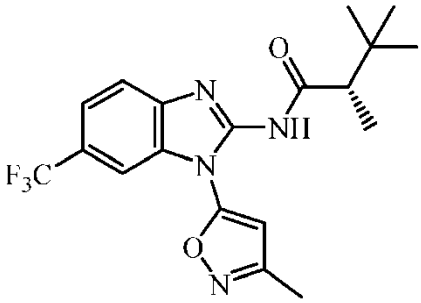

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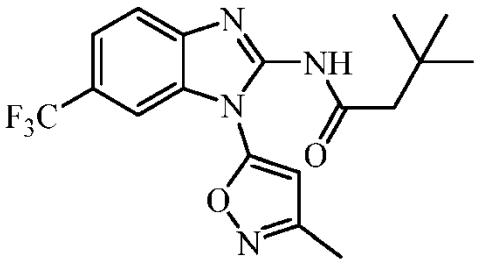

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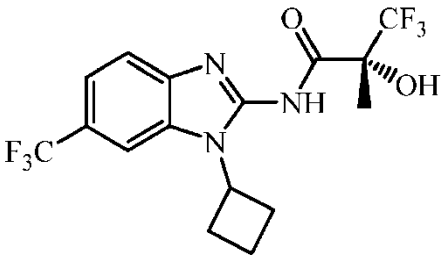

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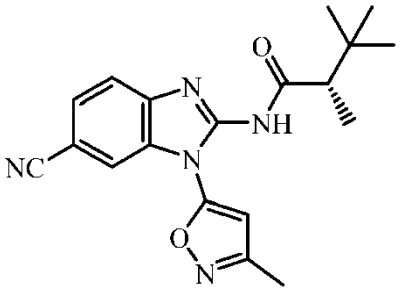

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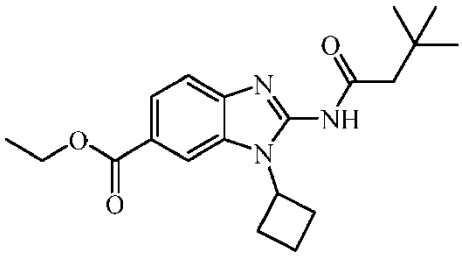

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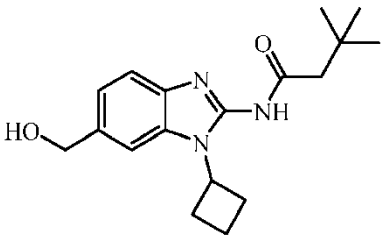

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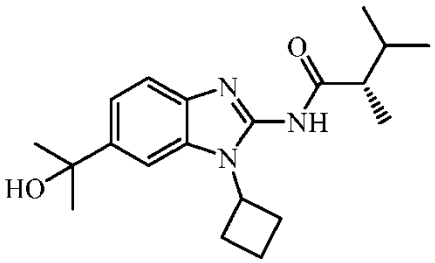

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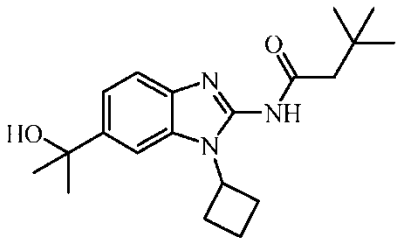

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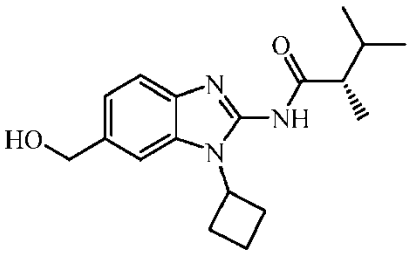

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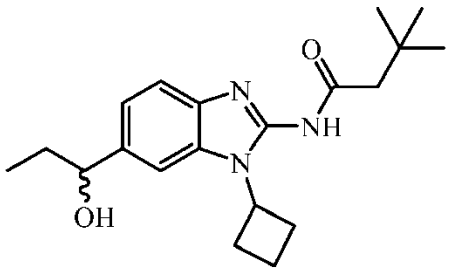

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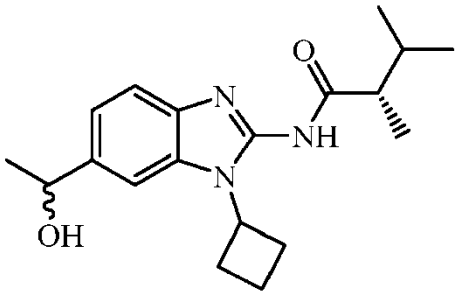

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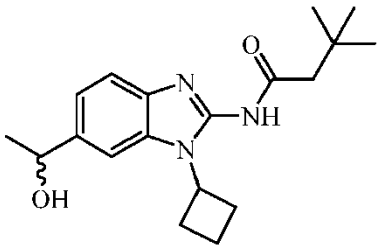

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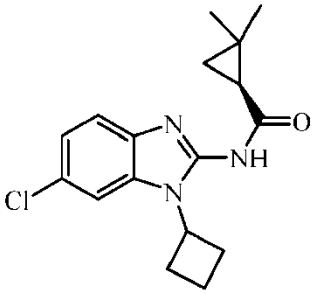

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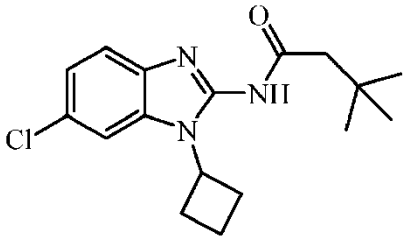

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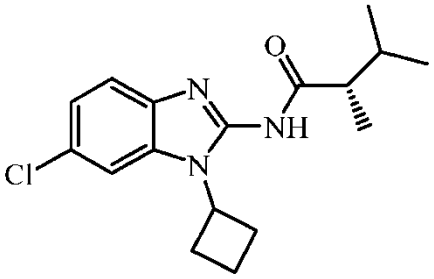

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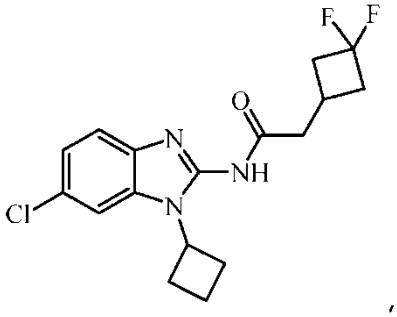

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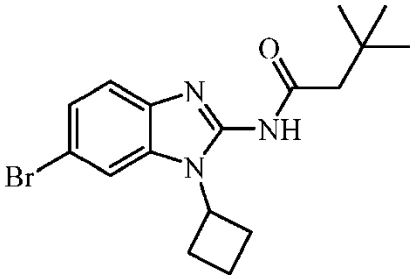

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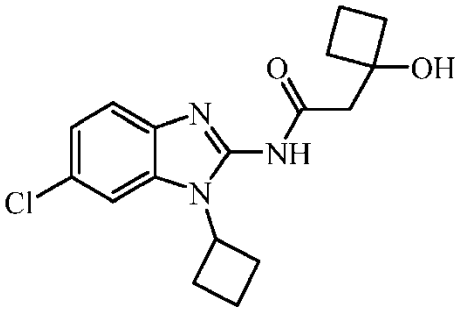

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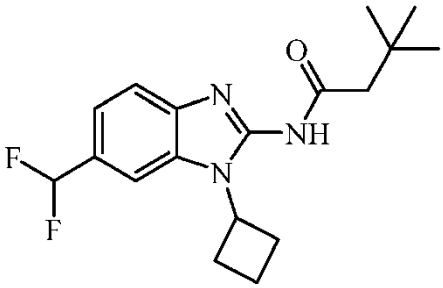

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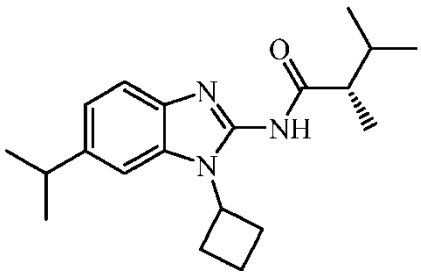

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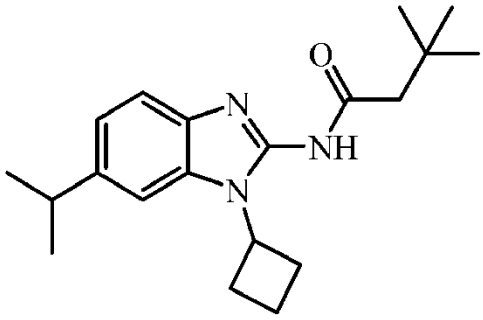

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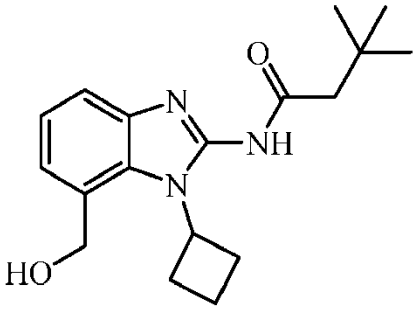

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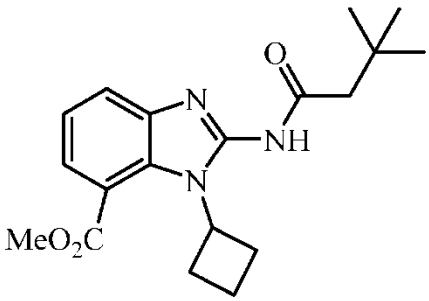

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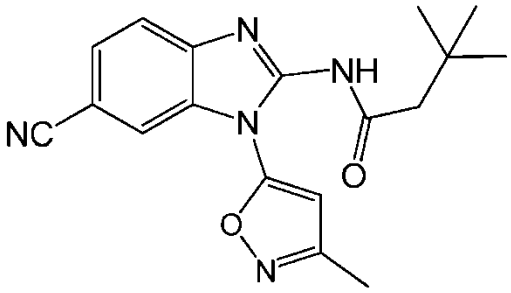

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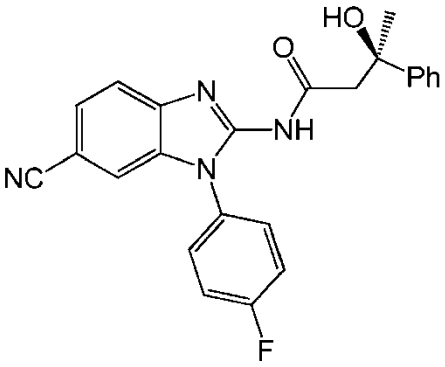

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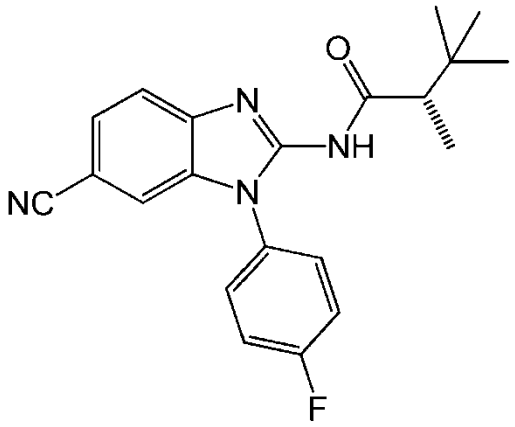

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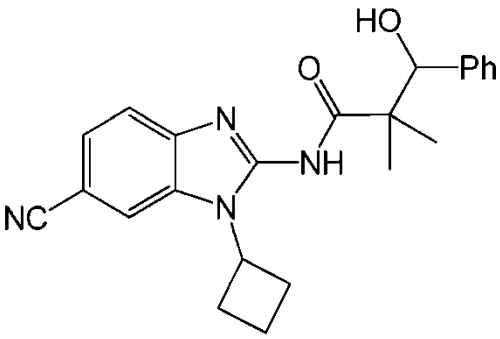

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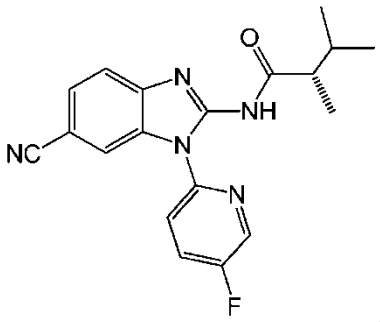

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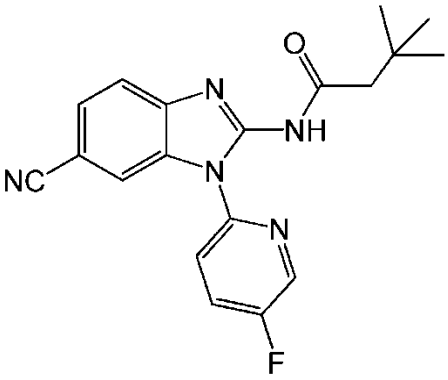
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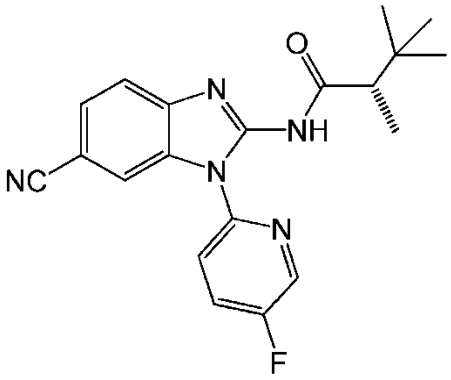
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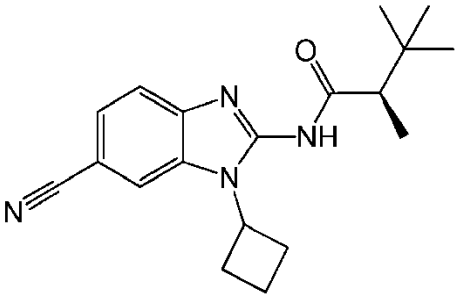
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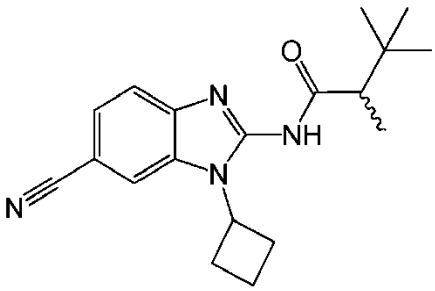
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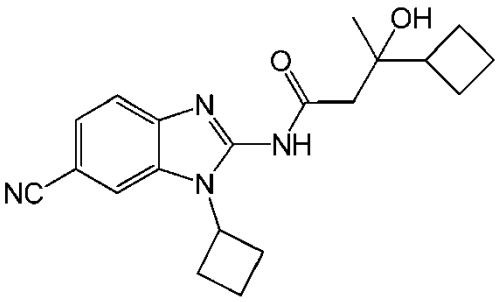
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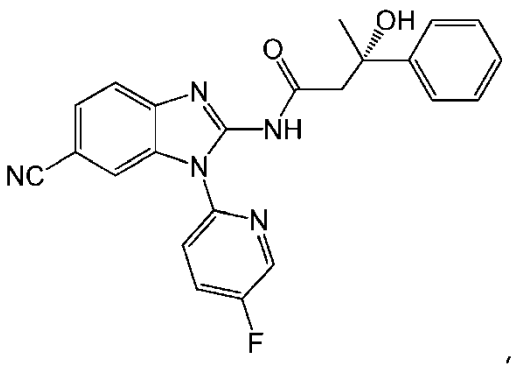
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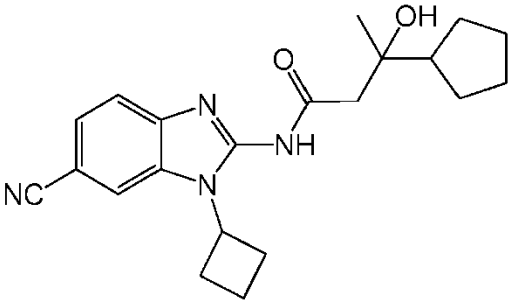
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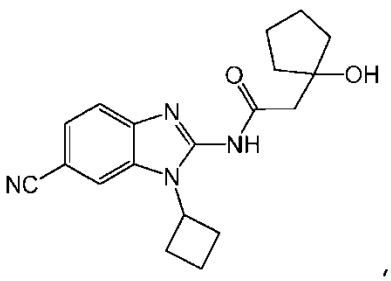
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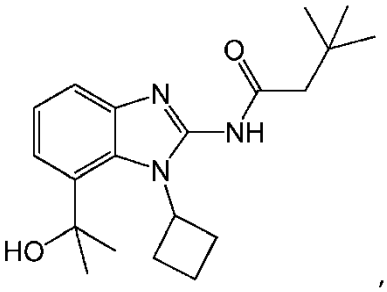
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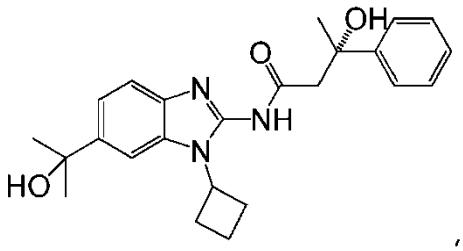
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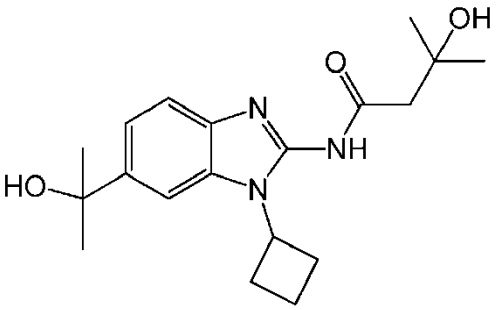
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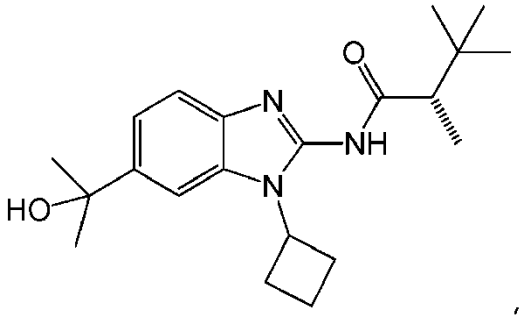
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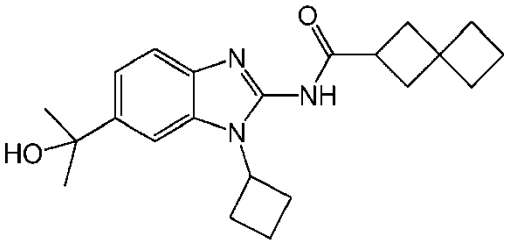
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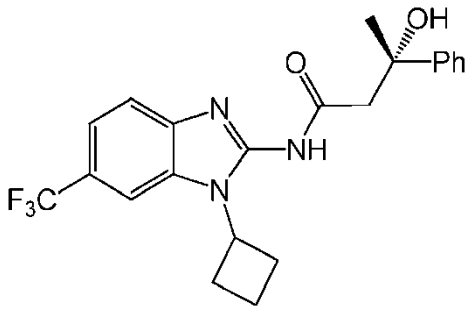
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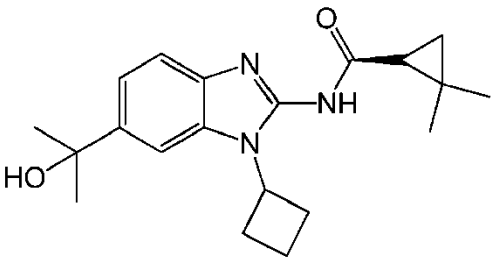
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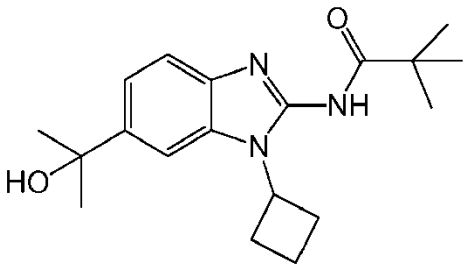
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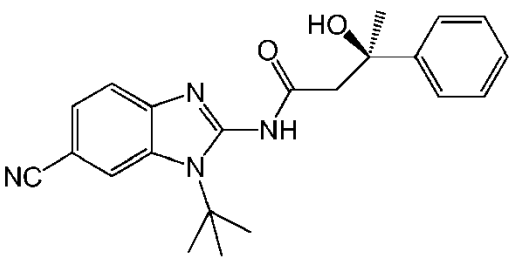
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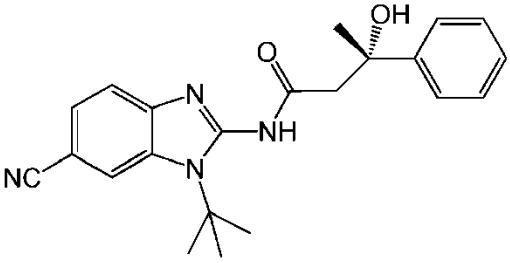
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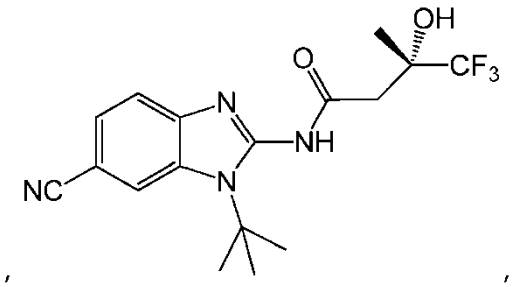
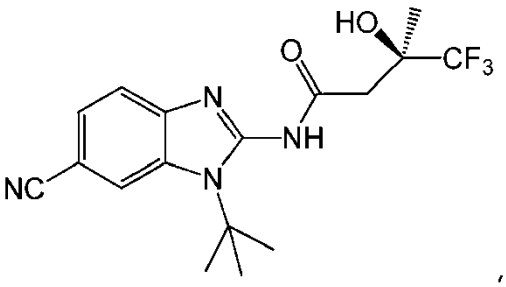
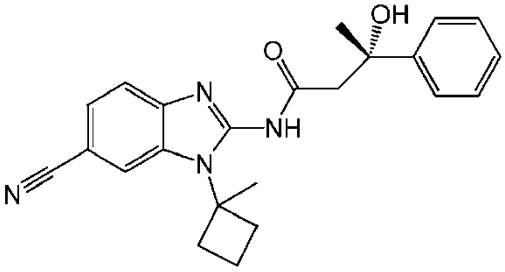
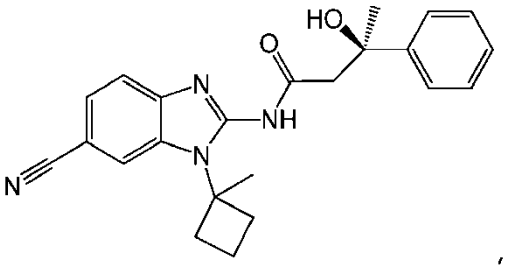
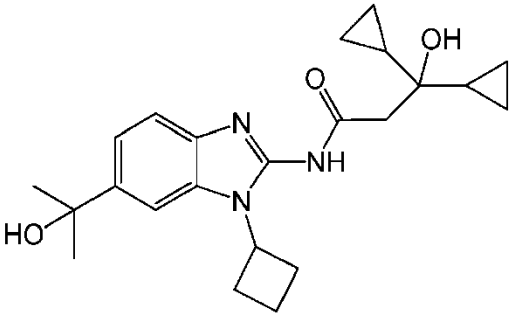
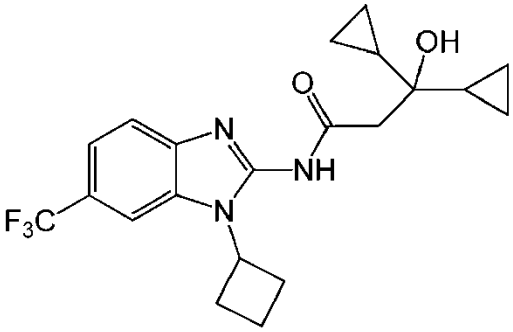
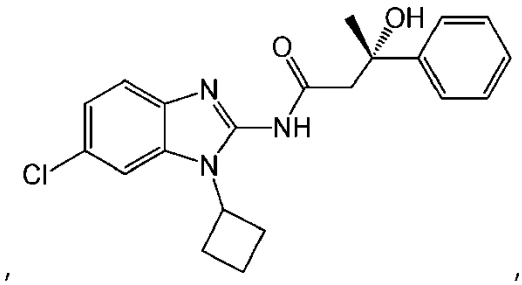
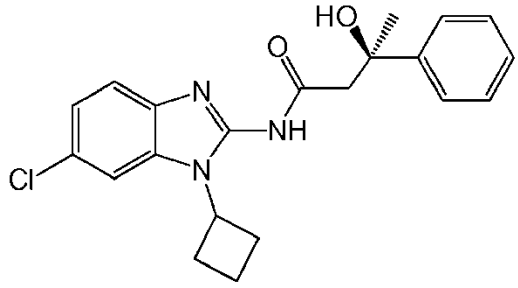
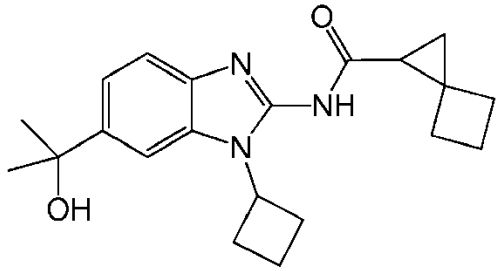
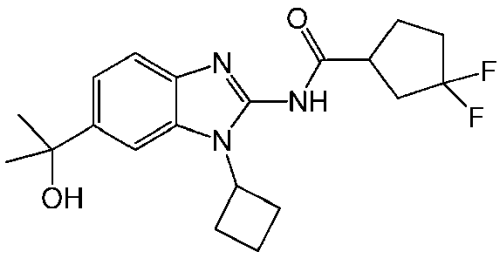

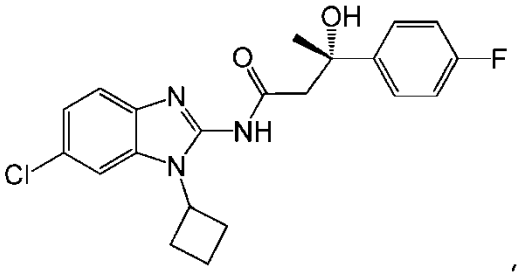
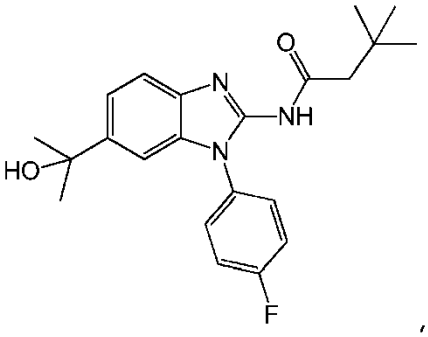
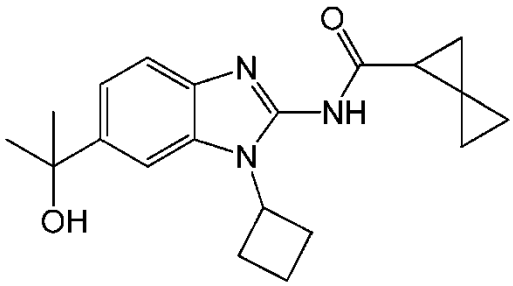
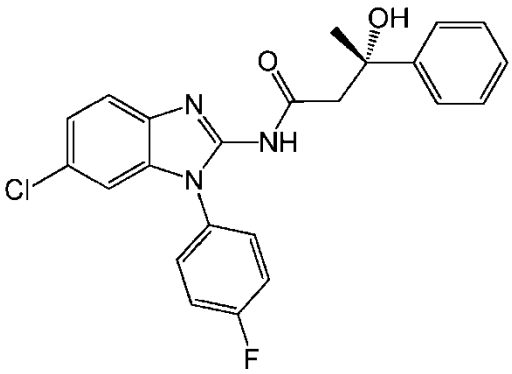
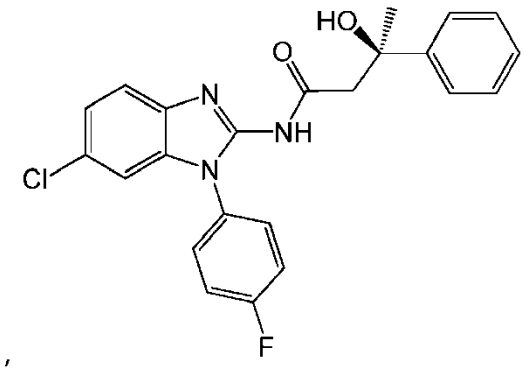
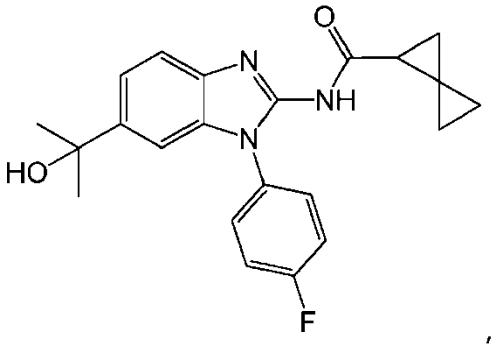
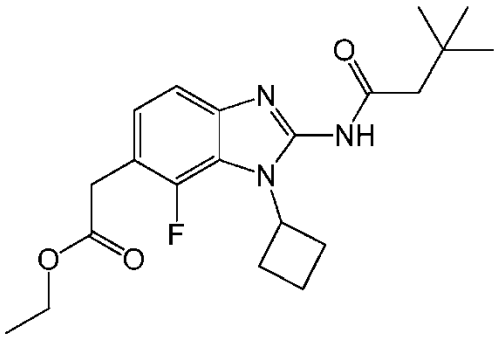
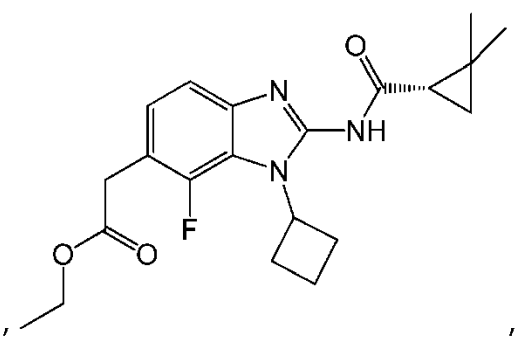

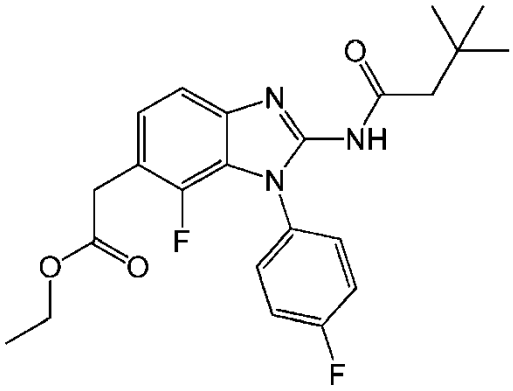

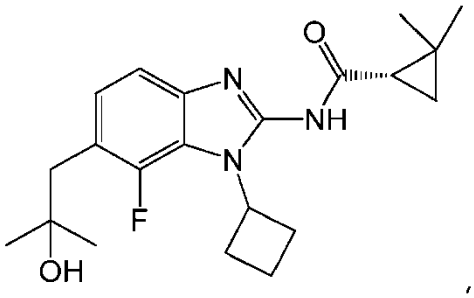

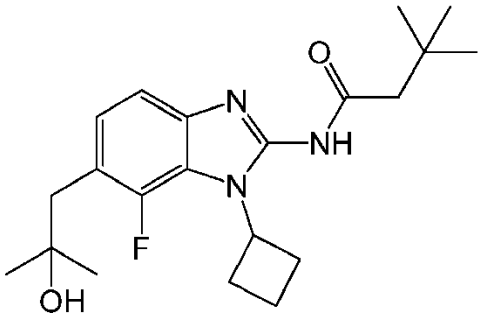

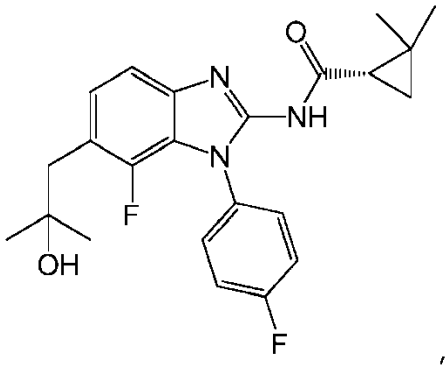

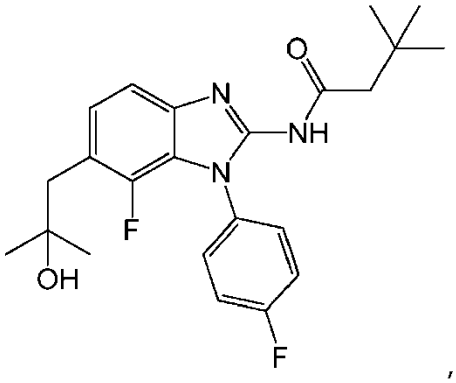

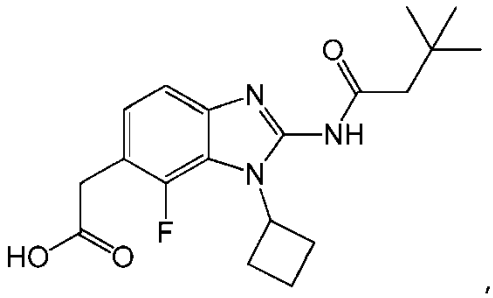

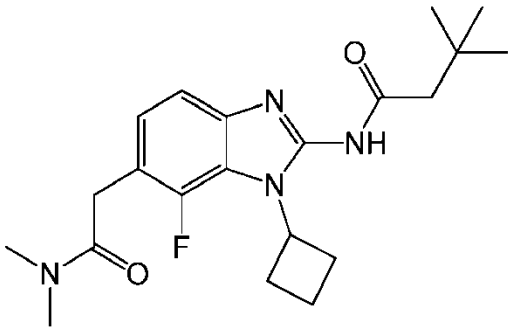

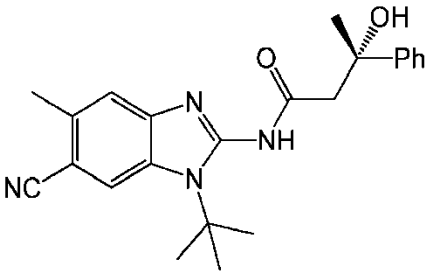

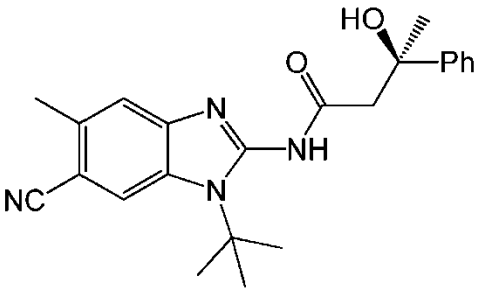

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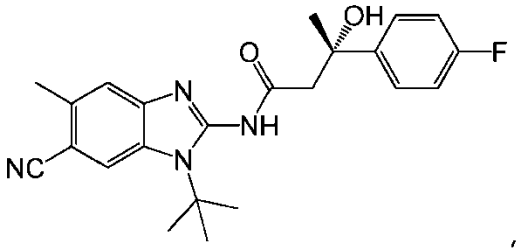

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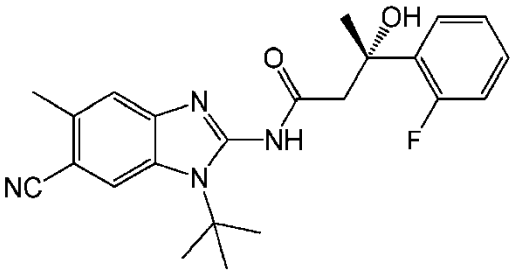

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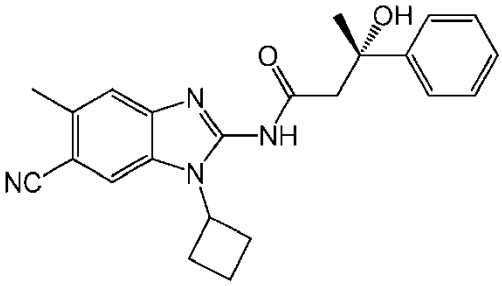

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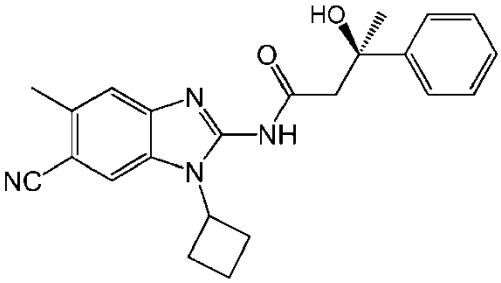

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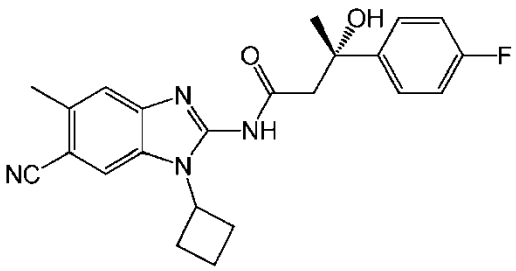

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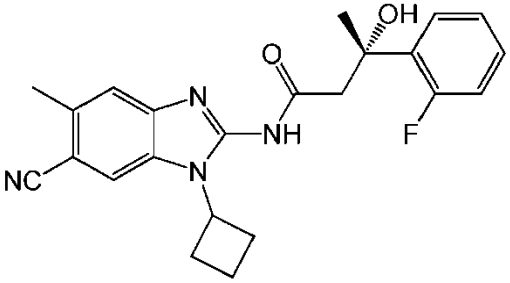

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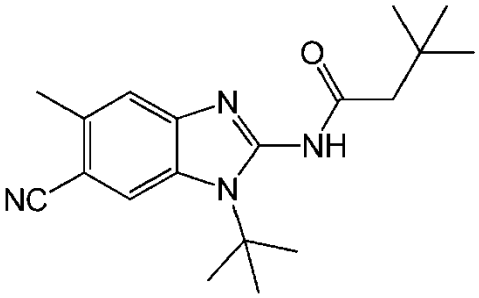

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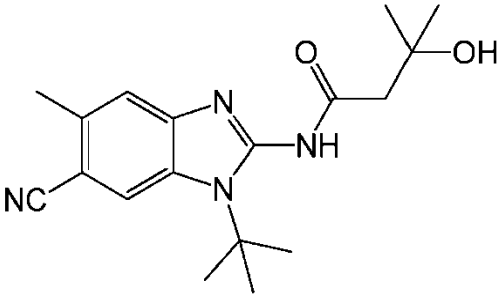

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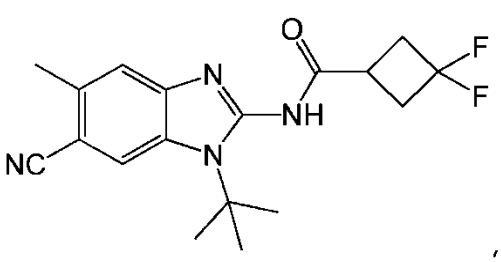

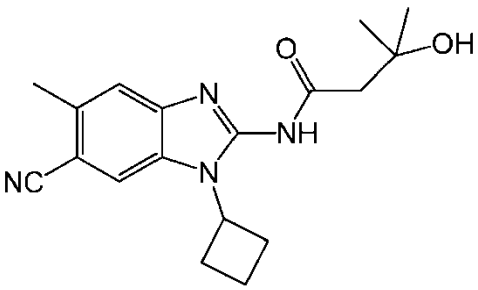

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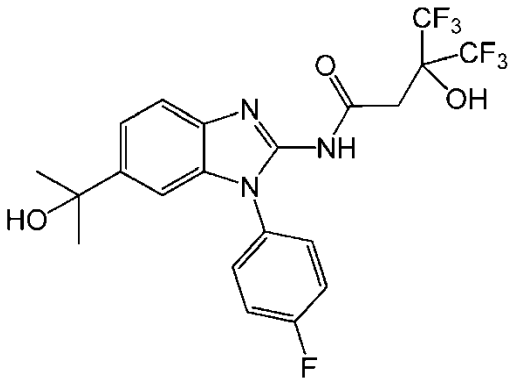

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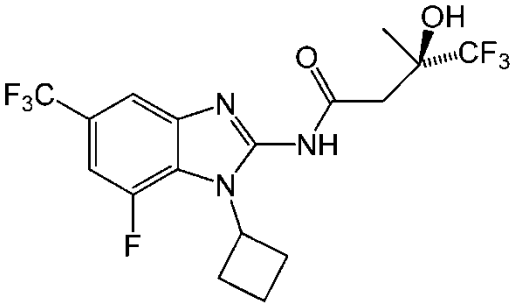

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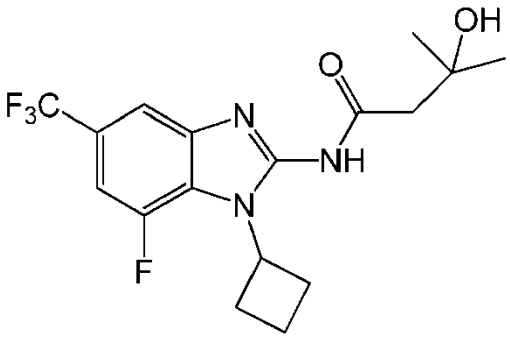

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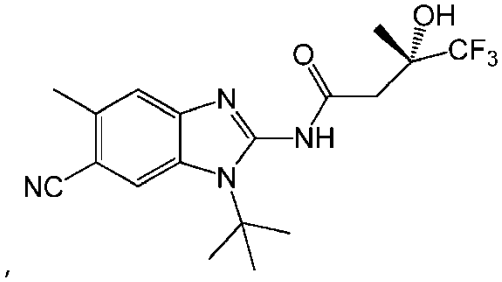

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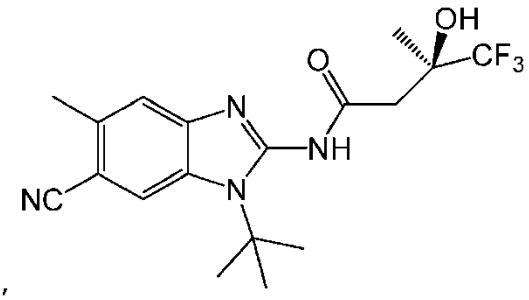

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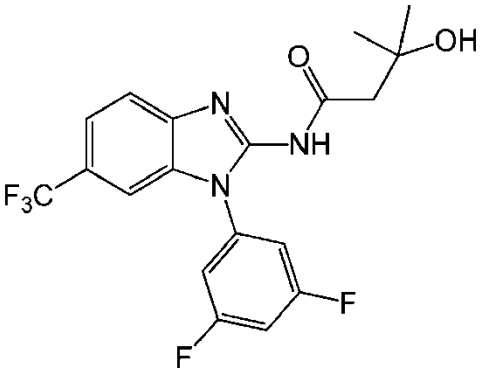

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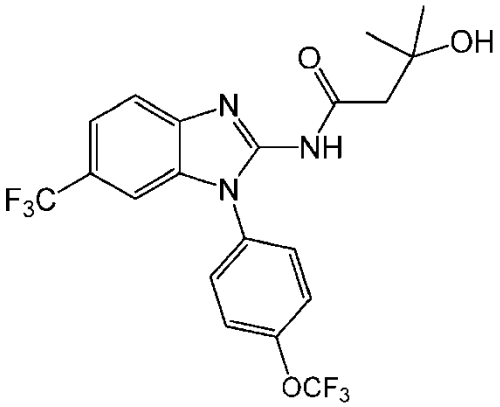

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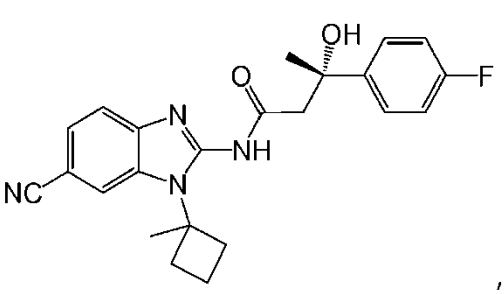

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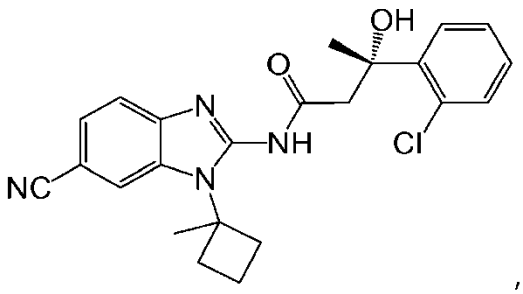

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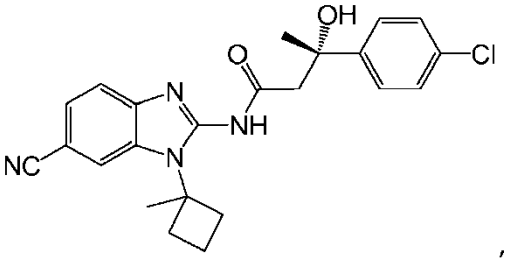

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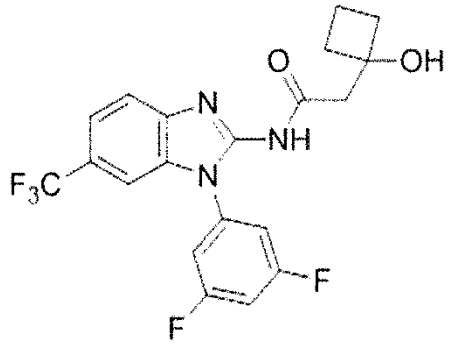

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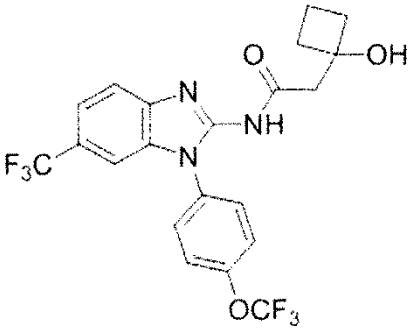

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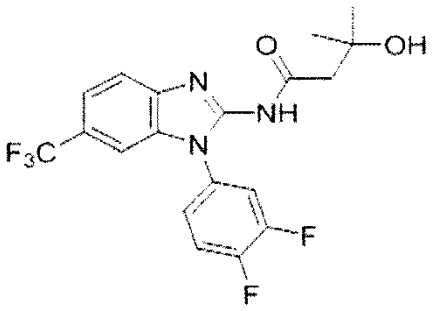

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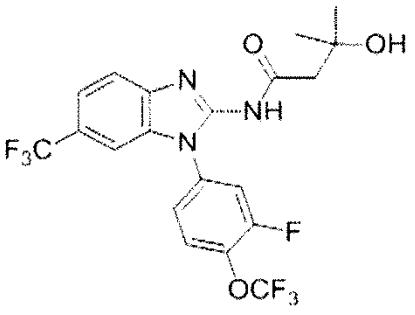

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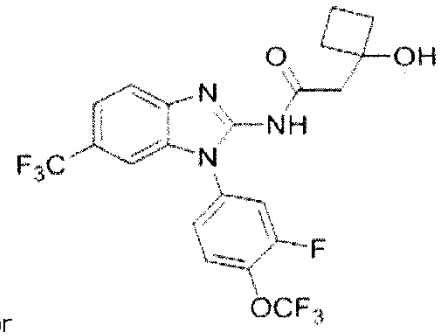

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11. Forbindelse ifølge krav 1 for anvendelse ved behandling av epilepsi, smerte, migrene eller tinnitus.

12. Forbindelse for anvendelse ifølge krav 11, hvor smerten er nevropatisk smerte, inflammatorisk smerte, vedvarende smerte, kreft smerte eller postoperative smerte.