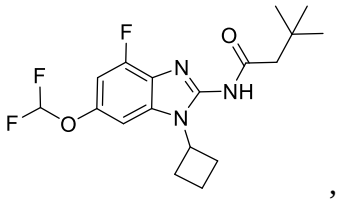
activation threshold. In addition, some openers appear to remove the voltage-dependence of activation entirely. Whether these effects represent some continuum is currently unclear since the effects are often concentration-dependent. Clearly, the modes of interaction of compounds that can increase channel current are complex and in most cases not well understood and the implications of these profiles on neuronal responsiveness and systems physiology are also unclear. Retigabine is modestly potent, not highly specific, but it is a very effective opener of Kv7.2, Kv7.5 and heteromultimeric Kv7 channels. Its effects are characterized by a significant increase in channel current over a narrow voltage range. As mentioned above, at more positive voltages the opener is less effective and under some conditions channel current significantly decreases at more positive voltages relative to control currents (this 'crossover' voltage-dependence of opener action is a characteristic of many neuronal Kv7 channel openers). This effect is also concentration-dependent and is more pronounced at higher concentrations.

[0006a] In one aspect, the present disclosure refers to a compound selected from the group consisting of: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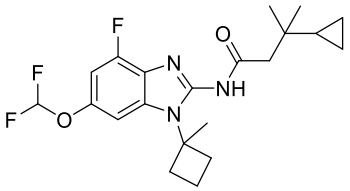
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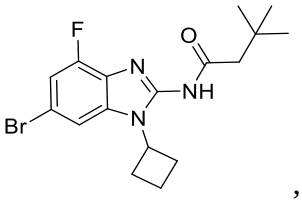
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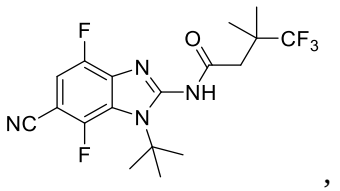
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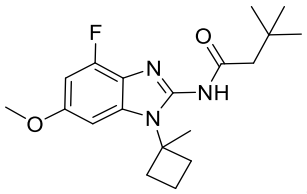
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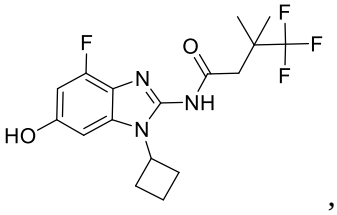
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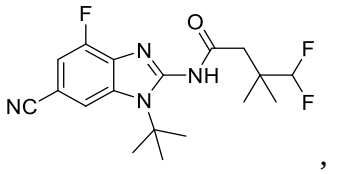
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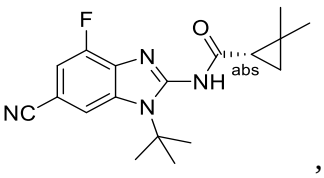
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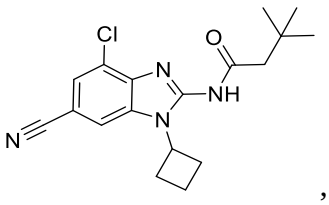
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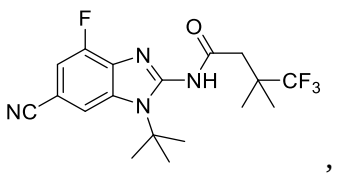
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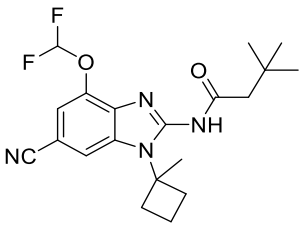
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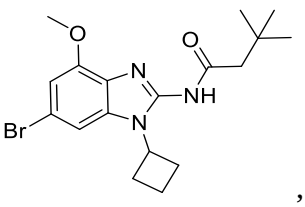
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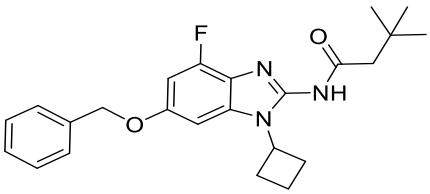
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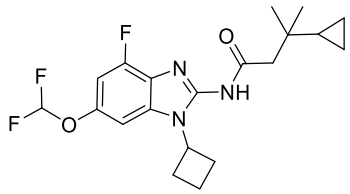
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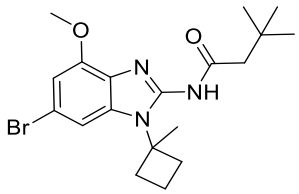
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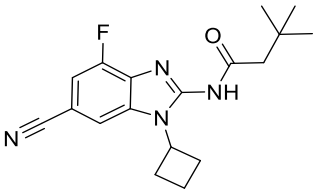
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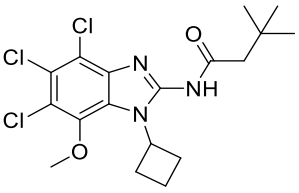
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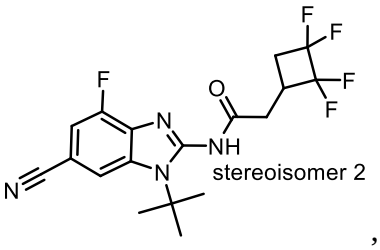

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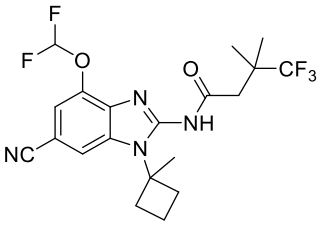
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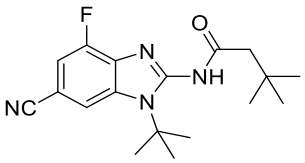
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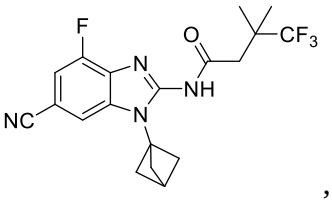
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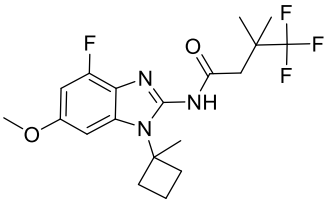
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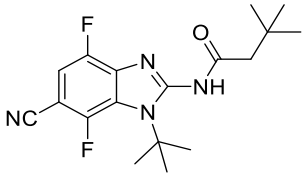
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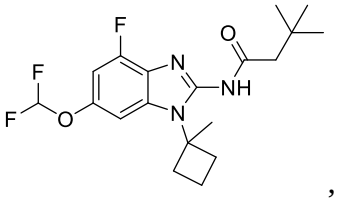
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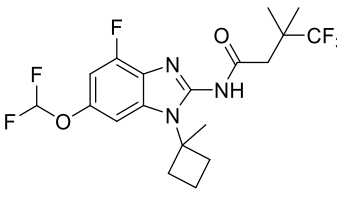
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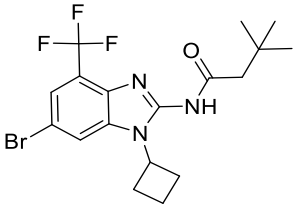
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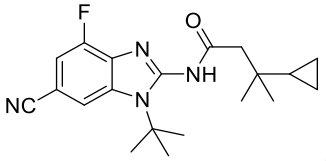
, or a pharmaceutically acceptable salt thereof.

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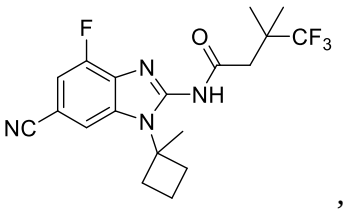

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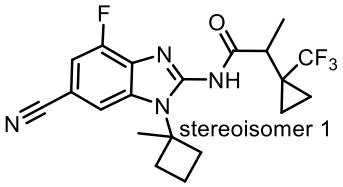

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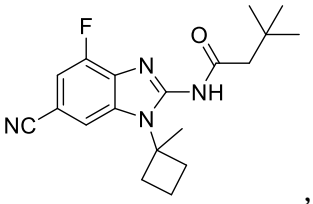

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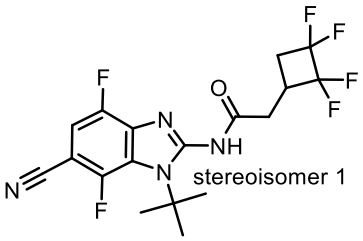

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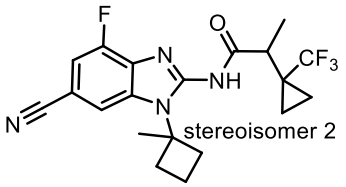

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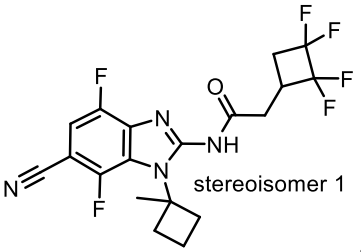

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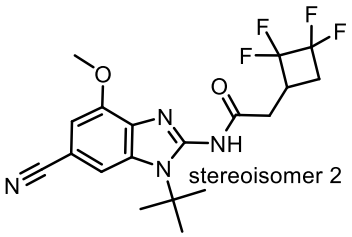

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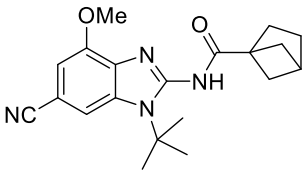

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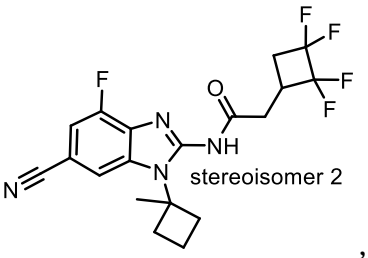

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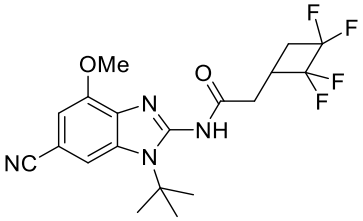

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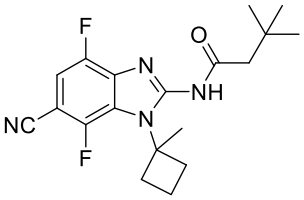

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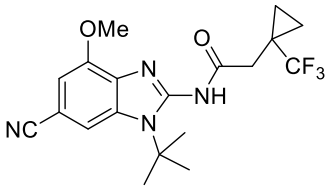

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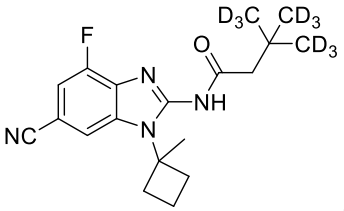

, or a pharmaceutically acceptable salt thereof

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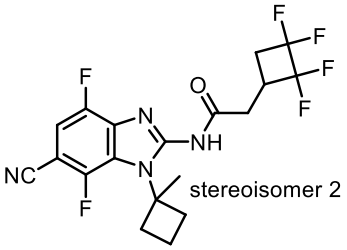

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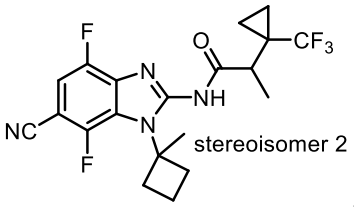

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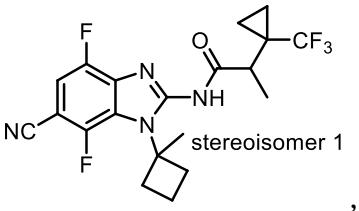

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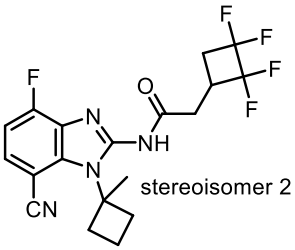

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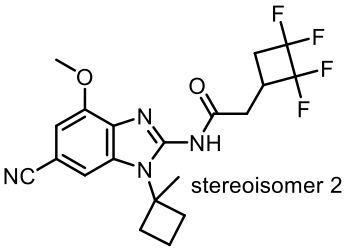

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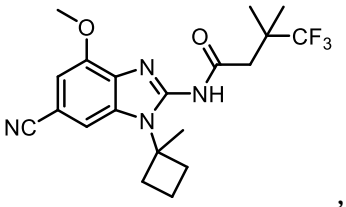

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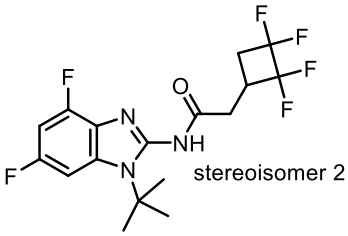

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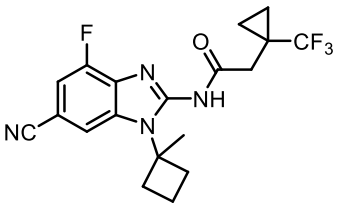

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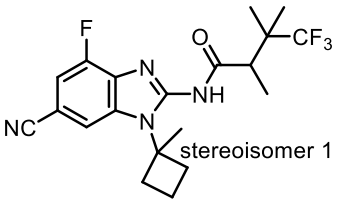

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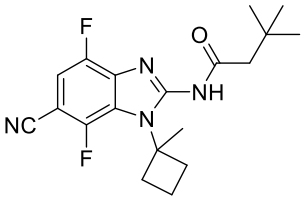

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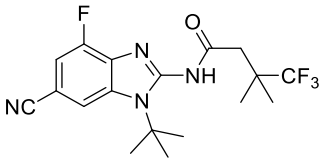

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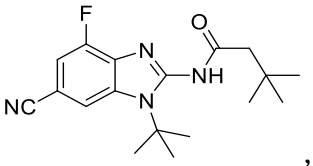

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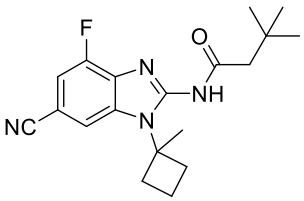

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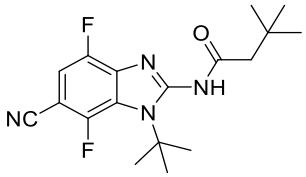

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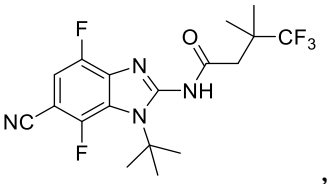

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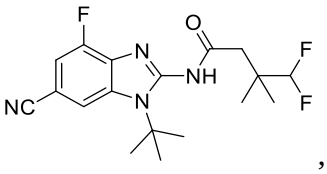

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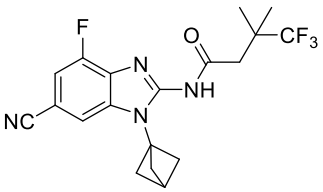

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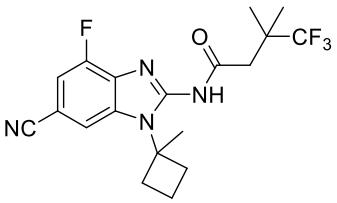

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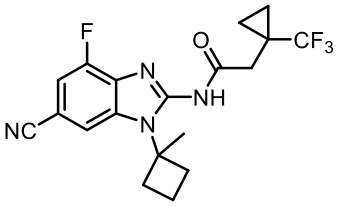


, or a pharmaceutically acceptable salt thereof.

[0006e] In another aspect, the present disclosure refers to a pharmaceutical composition comprising a compound as disclosed herein.

[0007] Provided herein are compounds that can be potent and/or at least biased for the Kv7.2/7.3 heteromultimer over the Kv7.4 homomultimer. These compounds may have reduced untoward side effects as compared to retigabine.

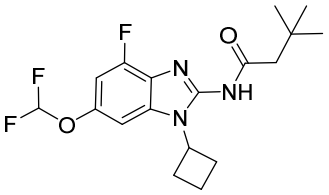
DETAILED DESCRIPTION

[0008] Before the present compositions and methods are described, it is to be understood that any invention is not limited to the particular processes, compositions, or methodologies described, as these may vary. Moreover, the processes, compositions, and methodologies described in particular embodiments are interchangeable. Therefore, for example, a composition, dosage regimen, route of administration, and so on described in a particular embodiment may be used in any of the methods described in other particular embodiments. It is also to be understood that the terminology used in the description is for the purpose of describing the particular versions or embodiments only, and is not intended to limit the scope of the present invention, which will be limited only by the appended claims. Unless clearly defined otherwise, all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art. Although any methods similar or equivalent to those described herein can be used in the practice or testing of embodiments of the present invention, the preferred methods are now described. All publications and references mentioned herein are incorporated by reference. Nothing herein is to be construed as an admission that the invention is not entitled to antedate such disclosure by virtue of prior invention.

CLAIMS

What is claimed is:

1. A compound selected from the group consisting of: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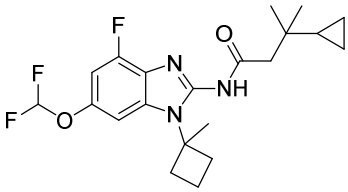
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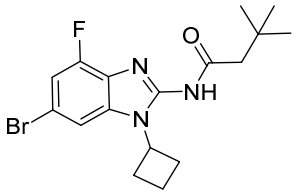
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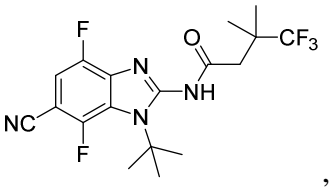
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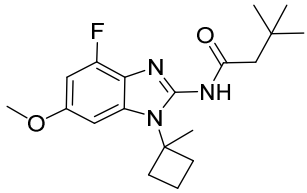
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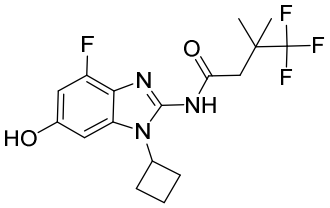
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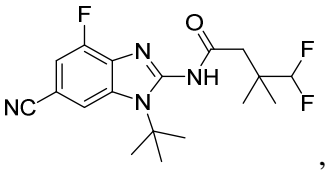
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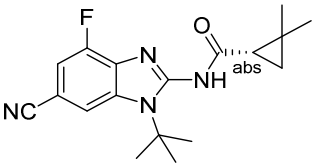
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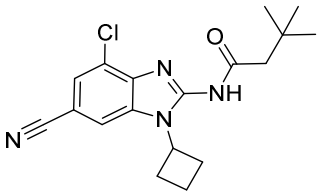
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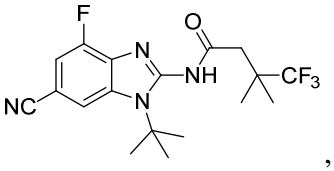
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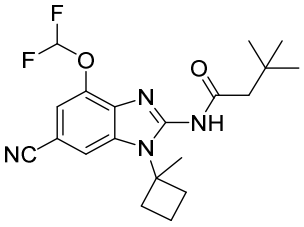
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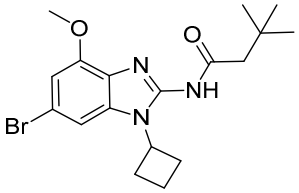
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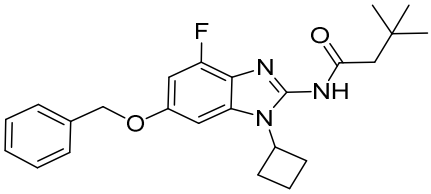
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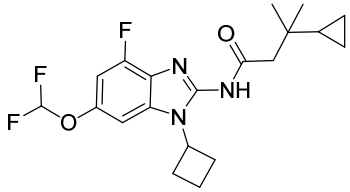
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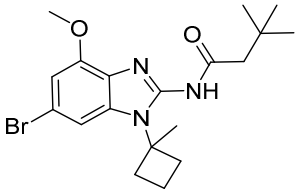
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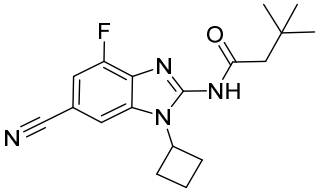
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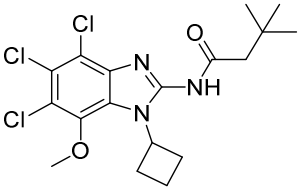
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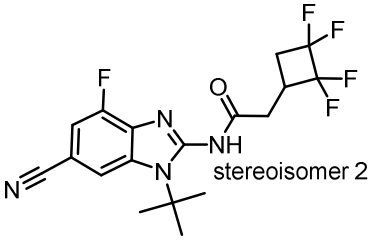
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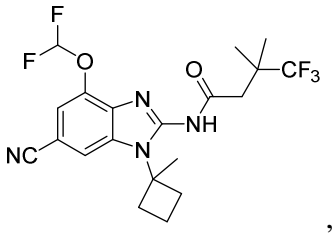
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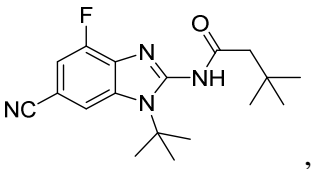
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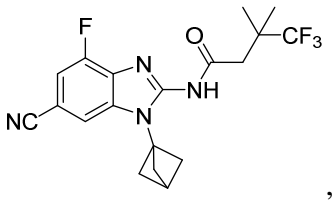
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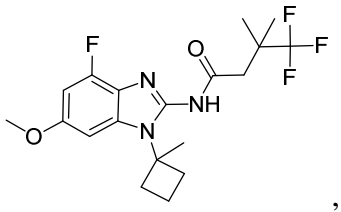
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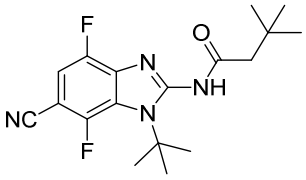
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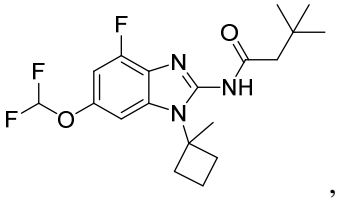
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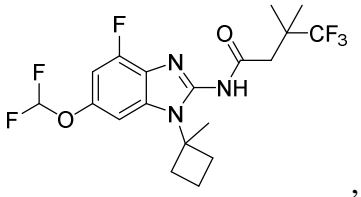
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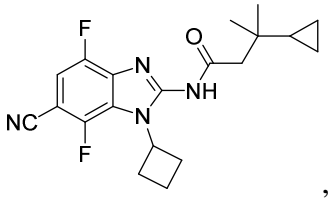
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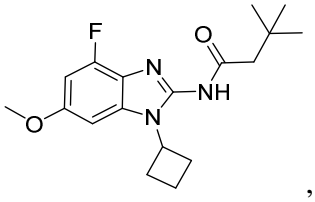
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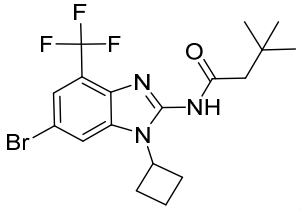
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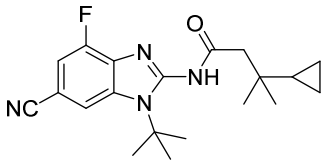
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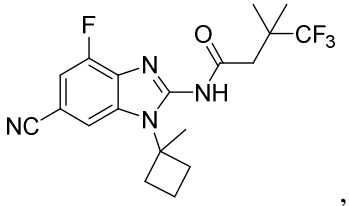
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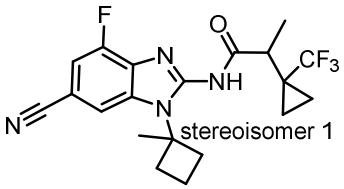
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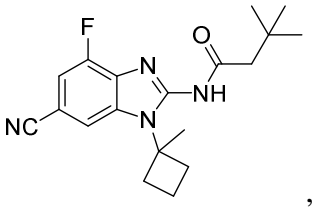
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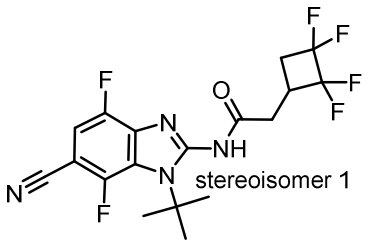
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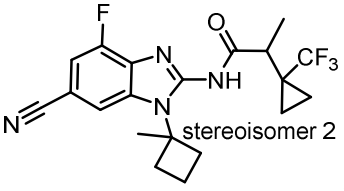
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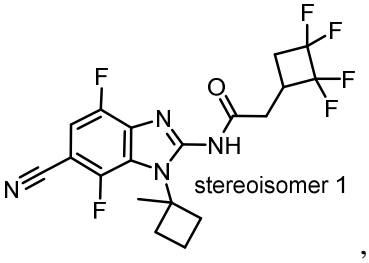
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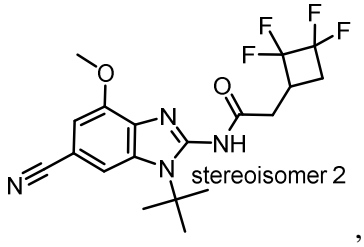

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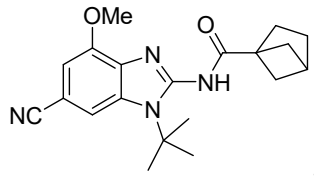

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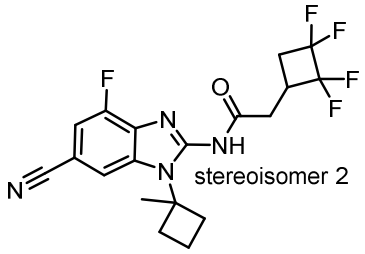

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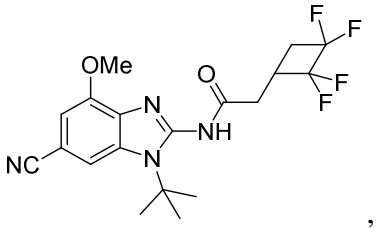

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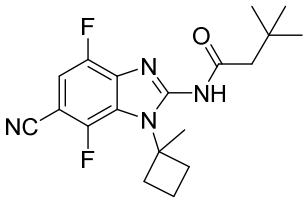

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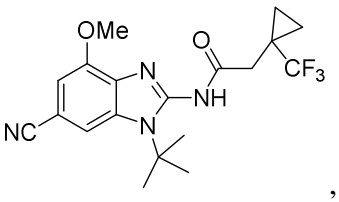

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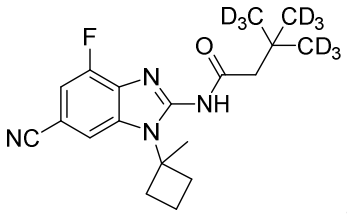

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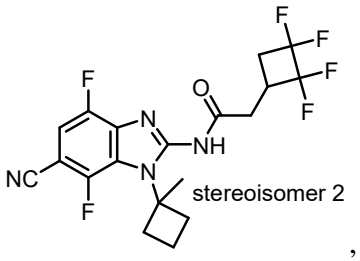

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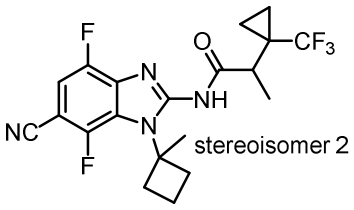

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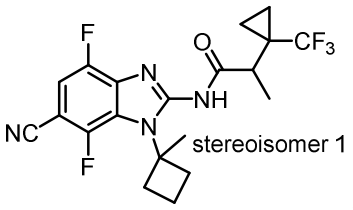

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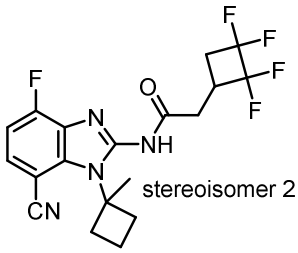

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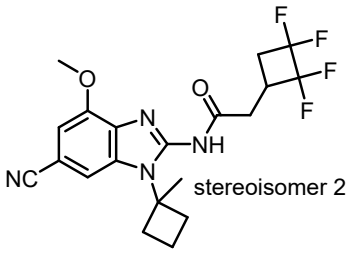

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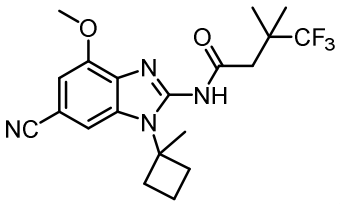

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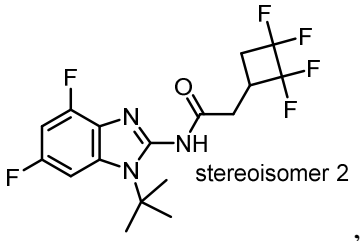
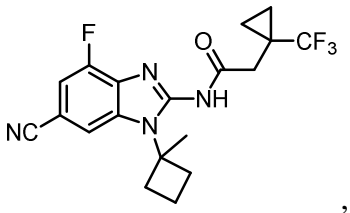
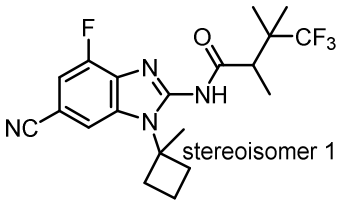


, 

, and 

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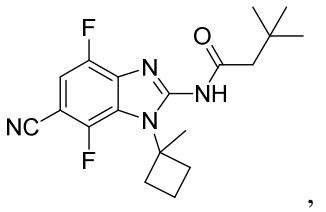
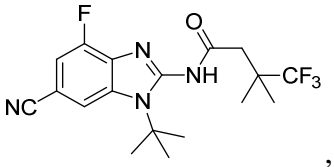
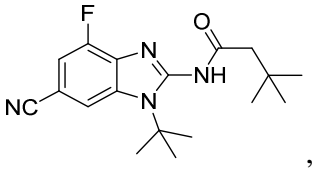


, 

, 

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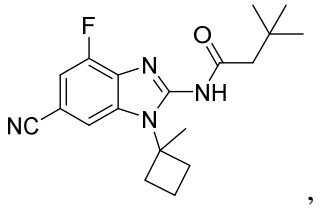
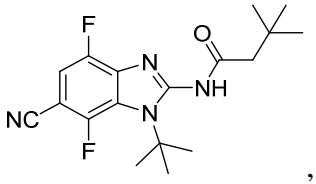
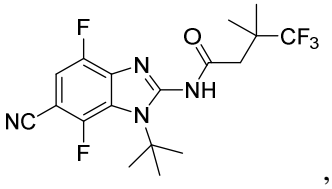


, 

, 

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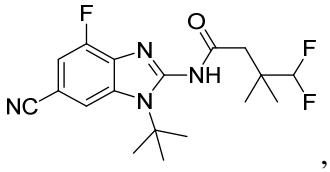
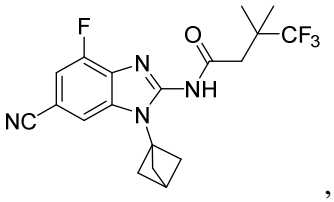
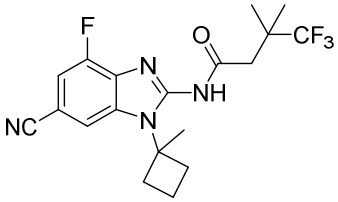
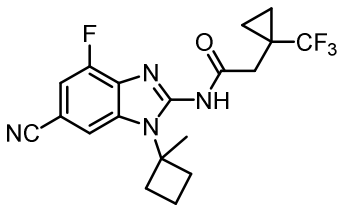


, 

, 

, and



, or a pharmaceutically acceptable salt thereof.

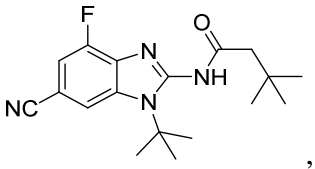
5. A pharmaceutical composition comprising a compound of Claim 1.

6. A pharmaceutical composition comprising a compound of Claim 2.

7. A pharmaceutical composition comprising a compound of Claim 3.

8. A pharmaceutical composition comprising a compound of Claim 4.

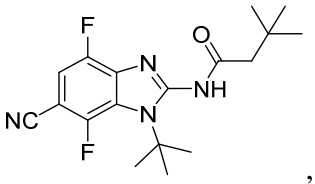
9. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition comprising a compound of Claim 9.

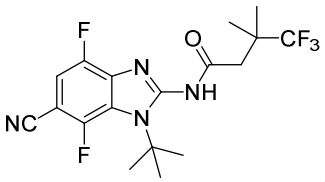
11. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

12. A pharmaceutical composition comprising a compound of Claim 11.

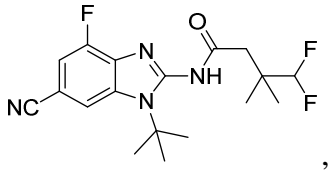
13. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

14. A pharmaceutical composition comprising a compound of Claim 13.

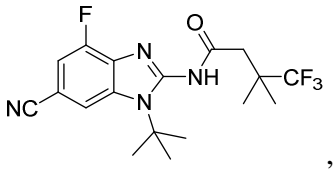
15. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

16. A pharmaceutical composition comprising a compound of Claim 15.

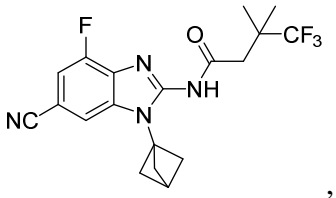
17. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

18. A pharmaceutical composition comprising a compound of Claim 17.

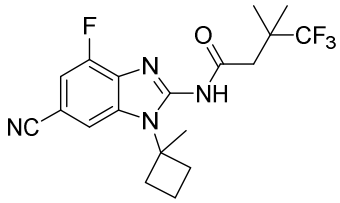
19. The compound of Claim 1, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition comprising a compound of Claim 19.

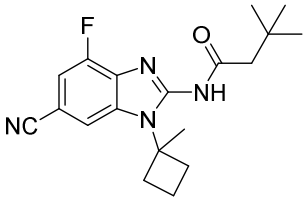
21. The compound of Claim 2, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

22. A pharmaceutical composition comprising a compound of Claim 21.

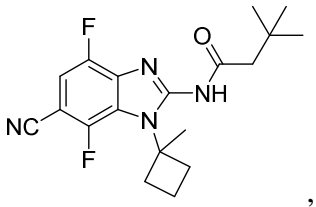
23. The compound of Claim 2, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

24. A pharmaceutical composition comprising a compound of Claim 23.

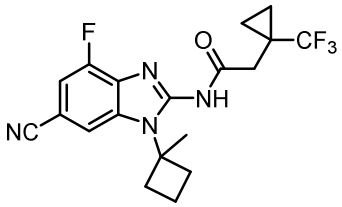
25. The compound of Claim 2, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

26. A pharmaceutical composition comprising a compound of Claim 25.

27. The compound of Claim 3, wherein the compound is:



, or a pharmaceutically acceptable salt thereof.

28. A pharmaceutical composition comprising a compound of Claim 27.