

(**I**)

wherein

A and **B** rings are each independently a single or fused aromatic or heteroaromatic ring system, or a single or fused C_3-C_{10} cycloalkyl or a single or fused C_3-C_{10} heterocyclic ring;

$\mathbf{R_1}$ and $\mathbf{R_2}$ are each independently H, F, Cl, Br, I, OH, SH, R_8-OH, R_8-SH, -R_8-O-R_{10}, CF_3, CD_3, OCD_3, CN, NO_2, -CH_2CN, -R_8CN, NH_2, NHR, $N(R)_2$, R_8-$N(R_{10})(R_{11})$, R_9-R_8-$N(R_{10})(R_{11})$ $B(OH)_2$, -OC(O)CF_3, -OCH_2Ph, NHC(O)-R_{10} NHCO-$N(R_{10})(R_{11})$ COOH, -C(O)Ph, C(O)O-R_{10}, R_8-C(O)-R_{10}, C(O)H, C(O)-R_{10}, C_1-C_5 linear or branched C(O)-haloalkyl, -C(O)NH_2, C(O)NHR, $C(O)N(R_{10})(R_{11})$, SO_2R, $SO_2N(R_{10})(R_{11})$, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, C_1-C_5 linear, branched or cyclic alkoxy optionally wherein at least one methylene group (CH_2) in the alkoxy is replaced with an oxygen atom, C_1-C_5 linear or branched thioalkoxy, C_1-C_5 linear or branched haloalkoxy, C_1-C_5 linear or branched alkoxyalkyl, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring, substituted or unsubstituted aryl, $CH(CF_3)(NH\text{-}R_{10})$;

or $\mathbf{R_2}$ and $\mathbf{R_1}$ are joint together to form a 5 or 6 membered substituted or unsubstituted, aliphatic or aromatic, carbocyclic or heterocyclic ring;

$\mathbf{R_3}$ is C_2-C_5 linear or branched haloalkyl, CF_2CH_3, CH_2CF_3, $CF_2CH_2CH_3$, $CH_2CH_2CF_3$, $CF_2CH(CH_3)_2$, $CF(CH_3)$-$CH(CH_3)_2$, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring;

$\mathbf{R_4}$ is H, F, Cl, Br, I, OH, SH, R_8-OH, R_8-SH, -R_8-O-R_{10}, CF_3, CD_3, OCD_3, CN, NO_2, -CH_2CN, -R_8CN, NH_2, NHR, $N(R)_2$, R_8-$N(R_{10})(R_{11})$, R_9-R_8-$N(R_{10})(R_{11})$, $B(OH)_2$, -OC(O)CF_3, -OCH_2Ph, -NHCO-R_{10}, NHCO-$N(R_{10})(R_{11})$, COOH, -C(O)Ph, C(O)O-R_{10}, R_8-C(O)-R_{10}, C(O)H, C(O)-R_{10}, C_1-C_5 linear or branched C(O)-haloalkyl, -C(O)NH_2, C(O)NHR, $C(O)N(R_{10})(R_{11})$, SO_2R, $SO_2N(R_{10})(R_{11})$, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, C_1-C_5 linear, branched or cyclic alkoxy, C_1-C_5 linear or branched thioalkoxy, C_1-C_5 linear or branched haloalkoxy, C_1-C_5 linear or branched alkoxyalkyl, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring, substituted or unsubstituted aryl, $CH(CF_3)(NH\text{-}R_{10})$;

or $\mathbf{R_3}$ and $\mathbf{R_4}$ are joint together to form a 5 or 6 membered substituted or unsubstituted, aliphatic or aromatic, carbocyclic or heterocyclic ring;

$\mathbf{R_5}$ is H, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, R_8-aryl, substituted or unsubstituted heteroaryl;

$\mathbf{R_6}$ is H, C_1-C_5 linear or branched alkyl;

$\mathbf{R_8}$ is $[CH_2]_p$

wherein **p** is between 1 and 10;

$\mathbf{R_9}$ is $[CH]_q$, $[C]_q$

wherein **q** is 2, 4, 6 or 8;

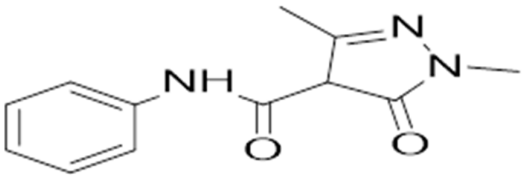
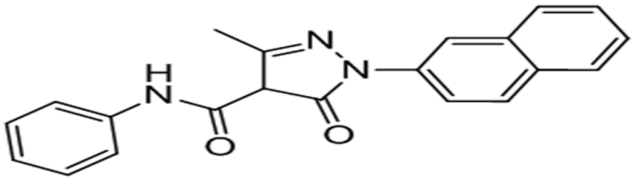
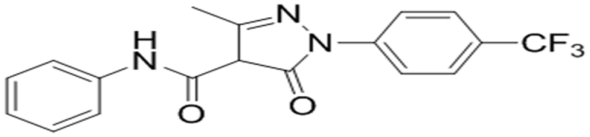
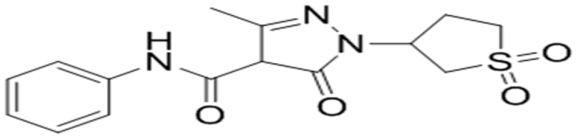
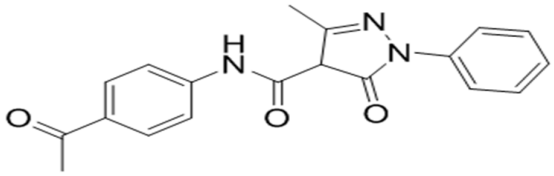
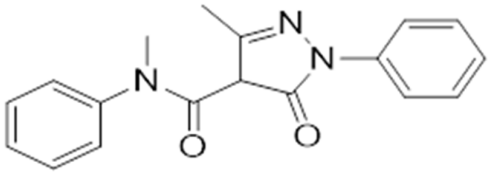
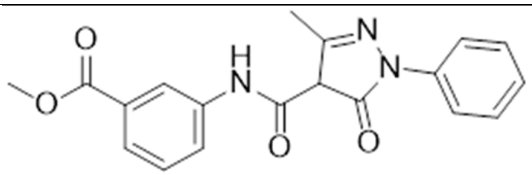
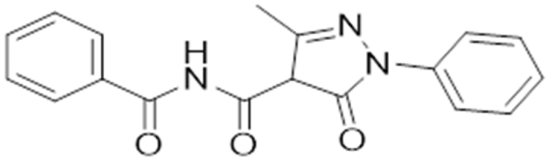
$\mathbf{R_{10}}$ and $\mathbf{R_{11}}$ are each independently H, C_1-C_5 linear or branched alkyl, C(O)R, or $S(O)_2$R;

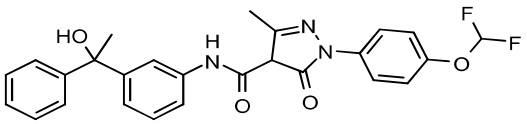
R is H, C_1-C_5 linear or branched alkyl, C_1-C_5 linear or branched alkoxy, phenyl, aryl or heteroaryl, or two gem R substituents are joint together to form a 5 or 6 membered heterocyclic ring;

m, **n** and **k** are each independently an integer between 0 and 4;

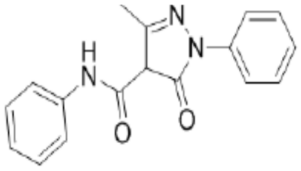
l is an integer between 1 and 4;

$\mathbf{Q_1}$ and $\mathbf{Q_2}$ are each independently S or O;

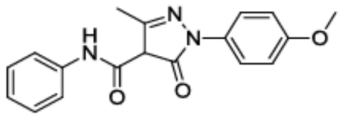
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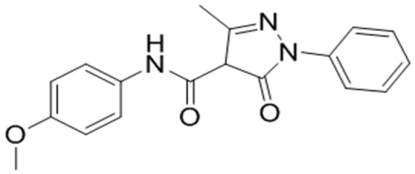
[0014c] In one aspect, the present disclosure refers to use of a compound represented by the following structures:



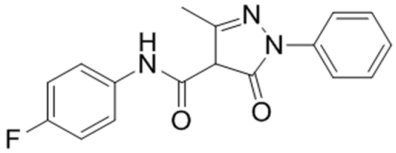
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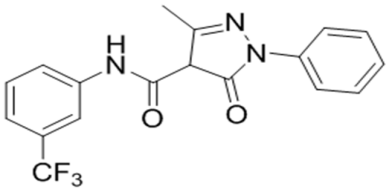
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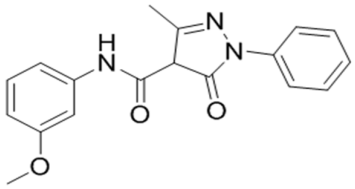
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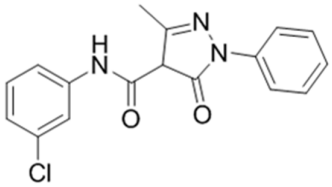
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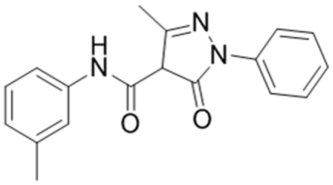
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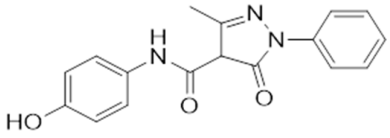
211



210 ;



212 ;



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in the manufacture of a medicament for:

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting cancer in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting human alcoholism in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a viral infection, such as human cytomegalovirus (HCMV) infection, in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting alcoholic steatohepatitis (ASH) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non alcoholic fatty liver disease (NAFLD) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non-alcoholic steatohepatitis (NASH) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a metabolic disorder such as obesity, hepatic steatosis and fatty liver disease in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a neuropsychiatric disease or disorder such as anxiety, depression, schizophrenia, autism and post-traumatic stress disorder in a subject; and/or

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting an autoimmune disease or disorder in a subject.

[0015] This disclosure further provides a pharmaceutical composition comprising a compound or its pharmaceutically acceptable salt, optical isomer, tautomer, hydrate, *N*-oxide, prodrug, isotopic variants (e.g., deuterated analog), PROTAC, pharmaceutical product or any combination thereof, represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, and a pharmaceutically acceptable carrier. In one aspect, the present disclosure refers to a pharmaceutical composition comprising a compound as defined herein and a pharmaceutically acceptable carrier.

[0015a] In one aspect, the present disclosure refers to a compound as defined herein for use as a medicament.

formula (I)-(V), and by the structures listed in Table 1, as defined herein below, with a cell, under conditions effective to suppress, reduce or inhibit acetyl-CoA synthesis from acetate in said cell. In various examples, the cell is a cancer cell. In various examples, the synthesis is mediated by ACSS2.

[0021] This disclosure further provides a method of suppressing, reducing or inhibiting acetate metabolism in a cancer cell, comprising contacting a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, with a cancer cell, under conditions effective to suppress, reduce or inhibit acetate metabolism in said cells. In various examples, the acetate metabolism is mediated by ACSS2. In various examples, the cancer cell is under hypoxic stress.

[0021a] In one aspect, the present disclosure refers to use of a compound as defined herein in the manufacture of a medicament for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting human alcoholism in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a viral infection, such as human cytomegalovirus (HCMV) infection, in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting alcoholic steatohepatitis (ASH) in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non alcoholic fatty liver disease (NAFLD) in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non-alcoholic steatohepatitis (NASH) in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a metabolic disorder such as obesity, hepatic steatosis and fatty liver disease in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a neuropsychiatric disease or disorder such as anxiety, depression, schizophrenia, autism and post-traumatic stress disorder in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting inflammatory condition in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting an autoimmune disease or disorder in a subject.

[0022] This disclosure further provides a method of treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting human alcoholism in a subject, comprising administering a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, to a subject suffering from alcoholism under conditions effective to treat, suppress, reduce the severity, reduce the risk of developing, or inhibit alcoholism in said subject.

[0023] This disclosure further provides a method of treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a viral infection in a subject, comprising administering a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, to a subject suffering from a viral infection under conditions effective to treat, suppress, reduce the severity, reduce the risk of developing, or inhibit the viral infection in said subject. In various examples, the viral infection is human cytomegalovirus (HCMV) infection.

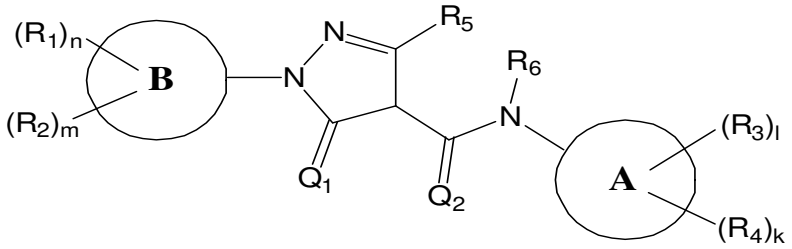
[0024] This disclosure further provides a method of treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a non-alcoholic steatohepatitis (NASH) in a subject, comprising administering a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, to a subject suffering from non-alcoholic steatohepatitis (NASH) under conditions effective to treat, suppress, reduce the severity, reduce the risk of developing, or inhibit the non-alcoholic steatohepatitis (NASH) in said subject.

[0025] This disclosure further provides a method of treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting an alcoholic steatohepatitis (ASH) in a subject, comprising administering a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, to a subject suffering from an alcoholic steatohepatitis (ASH) under conditions effective to treat, suppress, reduce the severity, reduce the risk of developing, or inhibit the alcoholic steatohepatitis (ASH) in said subject.

[0026] This disclosure further provides a method of treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a metabolic disorder in a subject, comprising administering a compound represented by the structure of formula (I)-(V), and by the structures listed in Table 1, as defined herein below, to a subject suffering from metabolic disorder under conditions effective to treat, suppress, reduce the severity, reduce the risk of developing, or inhibit metabolic disorder in said subject.

WHAT IS CLAIMED:

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



(**I**)

wherein

A and **B** rings are each independently a single or fused aromatic or heteroaromatic ring system, or a single or fused C_3-C_{10} cycloalkyl or a single or fused C_3-C_{10} heterocyclic ring;

R_1 and **R_2** are each independently H, F, Cl, Br, I, OH, SH, R_8-OH, R_8-SH, -R_8-O-R_{10}, CF_3, CD_3, OCD_3, CN, NO_2, -CH_2CN, -R_8CN, NH_2, NHR, $N(R)_2$, R_8-$N(R_{10})(R_{11})$, R_9-R_8-$N(R_{10})(R_{11})$ $B(OH)_2$, -$OC(O)CF_3$, -OCH_2Ph, $NHC(O)$-R_{10} $NHCO$-$N(R_{10})(R_{11})$ COOH, -C(O)Ph, C(O)O-R_{10}, R_8-C(O)-R_{10}, C(O)H, C(O)-R_{10}, C_1-C_5 linear or branched C(O)-haloalkyl, -$C(O)NH_2$, C(O)NHR, $C(O)N(R_{10})(R_{11})$, SO_2R, $SO_2N(R_{10})(R_{11})$, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, C_1-C_5 linear, branched or cyclic alkoxy optionally wherein at least one methylene group (CH_2) in the alkoxy is replaced with an oxygen atom, C_1-C_5 linear or branched thioalkoxy, C_1-C_5 linear or branched haloalkoxy, C_1-C_5 linear or branched alkoxyalkyl, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring, substituted or unsubstituted aryl, $CH(CF_3)(NH$-$R_{10})$;

or **R_2** and **R_1** are joint together to form a 5 or 6 membered substituted or unsubstituted, aliphatic or aromatic, carbocyclic or heterocyclic ring;

R_3 is C_2-C_5 linear or branched haloalkyl, CF_2CH_3, CH_2CF_3, $CF_2CH_2CH_3$, $CH_2CH_2CF_3$, $CF_2CH(CH_3)_2$, $CF(CH_3)$-$CH(CH_3)_2$, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring;

R_4 is H, F, Cl, Br, I, OH, SH, R_8-OH, R_8-SH, -R_8-O-R_{10}, CF_3, CD_3, OCD_3, CN, NO_2, -CH_2CN, -R_8CN, NH_2, NHR, $N(R)_2$, R_8-$N(R_{10})(R_{11})$, R_9-R_8-$N(R_{10})(R_{11})$, $B(OH)_2$, -$OC(O)CF_3$, -OCH_2Ph, -$NHCO$-R_{10}, $NHCO$-$N(R_{10})(R_{11})$, COOH, -C(O)Ph, C(O)O-R_{10}, R_8-C(O)-R_{10}, C(O)H, C(O)-R_{10}, C_1-C_5 linear or branched C(O)-haloalkyl, -$C(O)NH_2$, C(O)NHR, $C(O)N(R_{10})(R_{11})$, SO_2R, $SO_2N(R_{10})(R_{11})$, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, C_1-C_5 linear, branched or cyclic alkoxy, C_1-C_5 linear or branched thioalkoxy, C_1-C_5 linear or branched haloalkoxy, C_1-C_5 linear or branched alkoxyalkyl, substituted or unsubstituted C_3-C_8 cycloalkyl, substituted or unsubstituted C_3-C_8 heterocyclic ring, substituted or unsubstituted aryl, $CH(CF_3)(NH$-$R_{10})$;

or **R_3** and **R_4** are joint together to form a 5 or 6 membered substituted or unsubstituted, aliphatic or aromatic, carbocyclic or heterocyclic ring;

R_5 is H, C_1-C_5 linear or branched, substituted or unsubstituted alkyl, C_1-C_5 linear or branched haloalkyl, R_8-aryl, substituted or unsubstituted heteroaryl;

R_6 is H, C_1-C_5 linear or branched alkyl;

R_8 is $[CH_2]_p$

wherein **p** is between 1 and 10;

R_9 is $[CH]_q$, $[C]_q$

wherein **q** is 2, 4, 6 or 8;

R_{10} and **R_{11}** are each independently H, C_1-C_5 linear or branched alkyl, C(O)R, or $S(O)_2R$;

R is H, C_1-C_5 linear or branched alkyl, C_1-C_5 linear or branched alkoxy, phenyl, aryl or heteroaryl, or two gem R substituents are joint together to form a 5 or 6 membered heterocyclic ring;

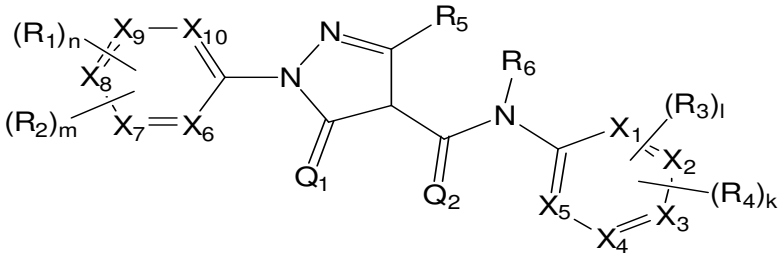
m, **n** and **k** are each independently an integer between 0 and 4;

l is an integer between 1 and 4;

Q_1 and **Q_2** are each independently S or O;

or its pharmaceutically acceptable salt, optical isomer, tautomer, hydrate, *N*-oxide, isotopic variant, pharmaceutical product or any combination thereof.

2. The compound of claim 1, represented by the structure of formula (II):



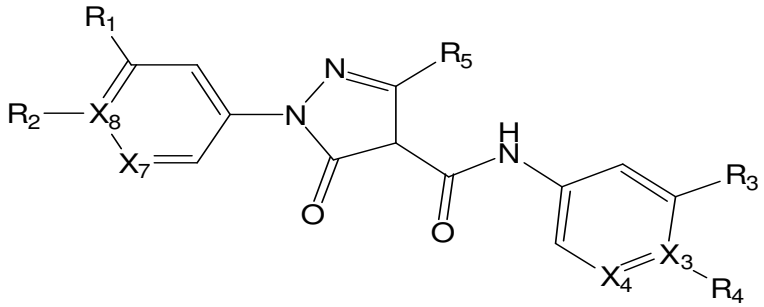
(II)

wherein

R_1, R_2, R_3, R_4, **R_5**, **R_6, R_8, R_{10}**, **R_{11}, R, m**, **n, l, k, Q_1** and **Q_2** are as defined in claim 1; and

X_1, **X_2**, **X_3**, **X_4**, **X_5**, **X_6**, **X_7**, **X_8**, **X_9** or **X_{10}** are each independently C or N;

or represented by the structure of formula (IV):



(IV)

wherein

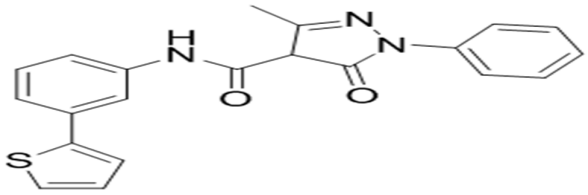
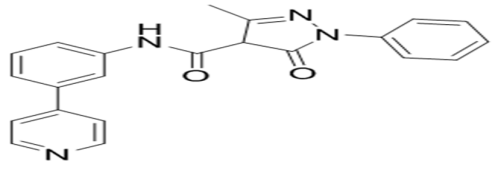
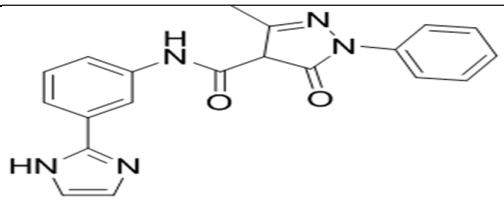
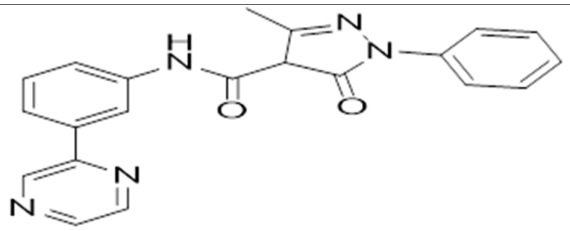
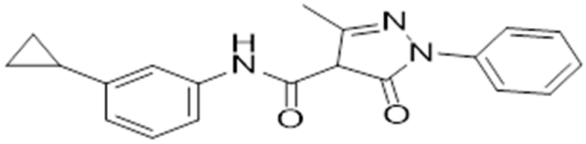
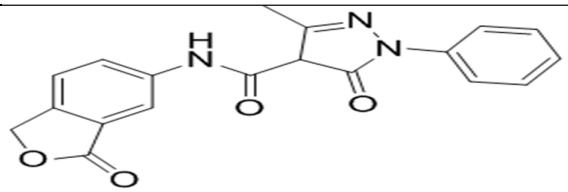
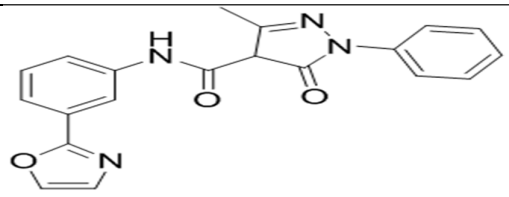
R_1, R_2, R_3, R_4, and **R_5** are as defined in claim 1; and

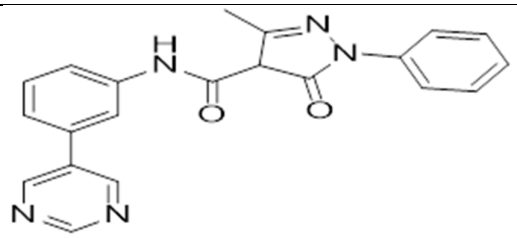
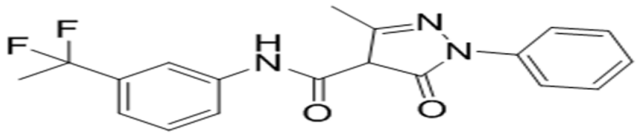
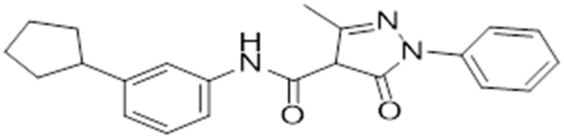
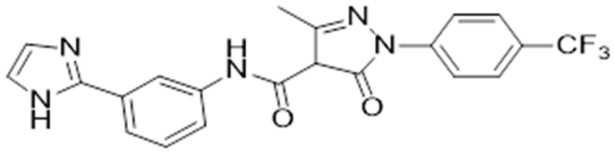
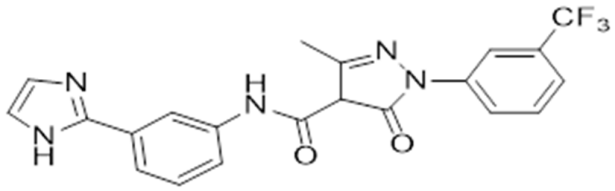
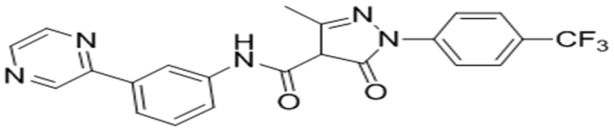
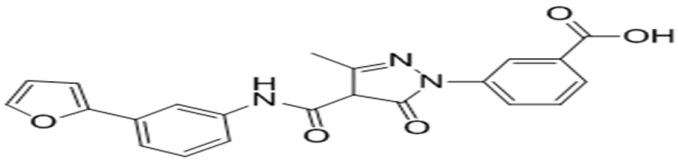
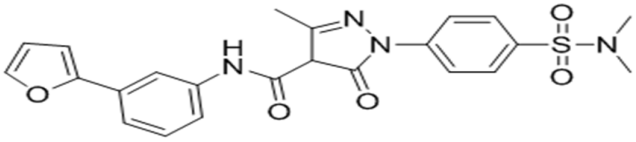
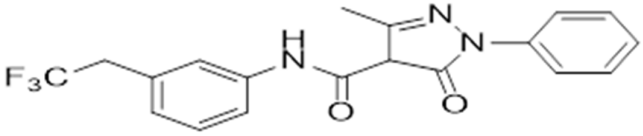
X_3, **X_4**, **X_7**, and **X_8** are each independently C or N;

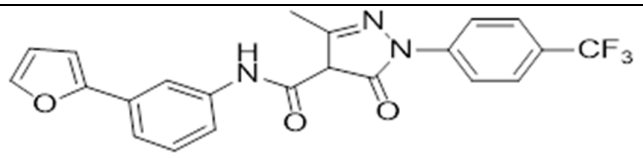
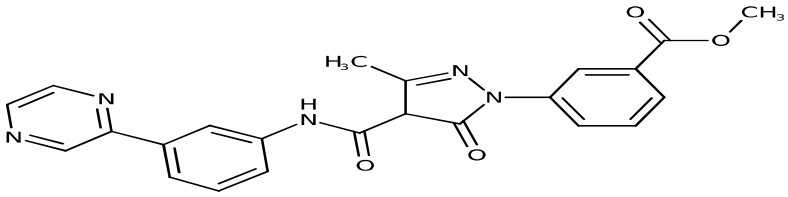
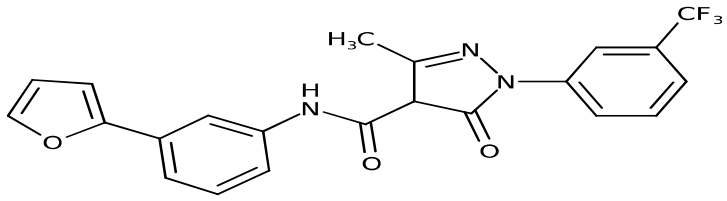
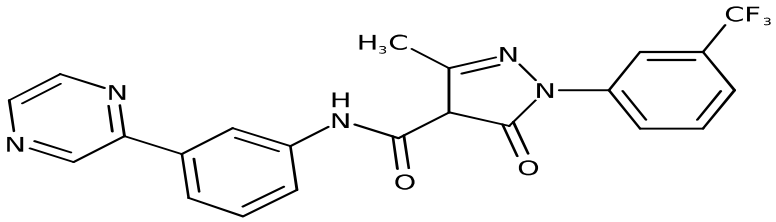
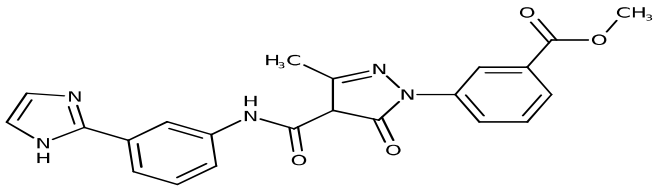
wherein if X_3 is N, then R_4 is absent; and

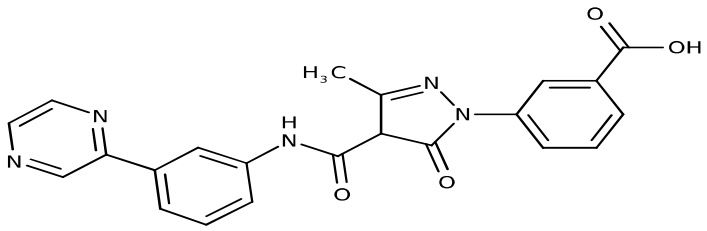
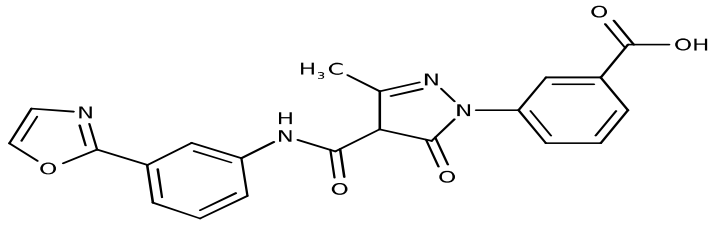
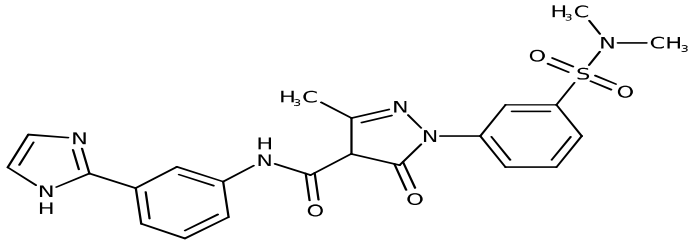
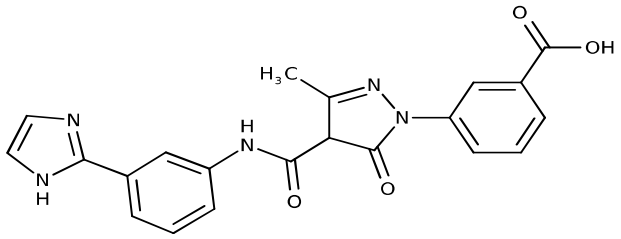
wherein if X_8 is N, then R_2 is absent.

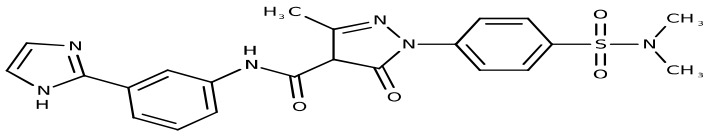
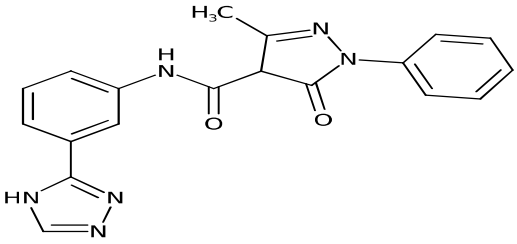
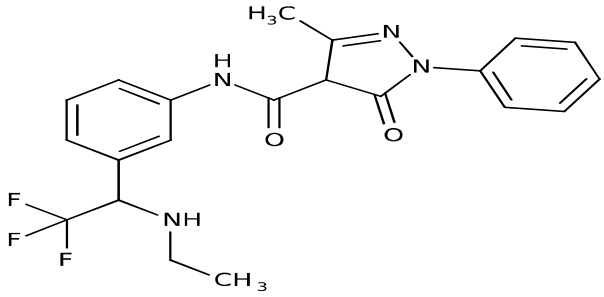
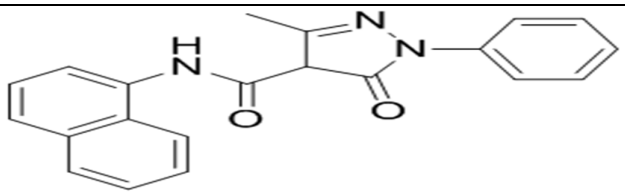
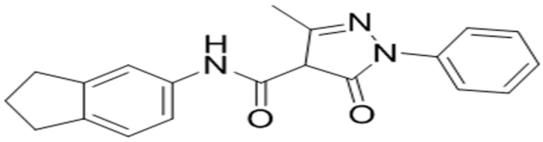
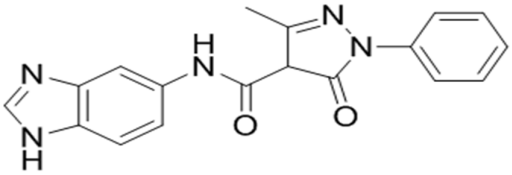
3. The compound of claim 1, selected from the following:

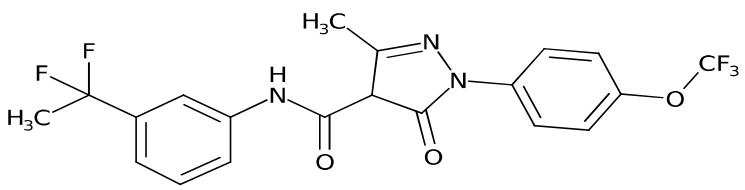
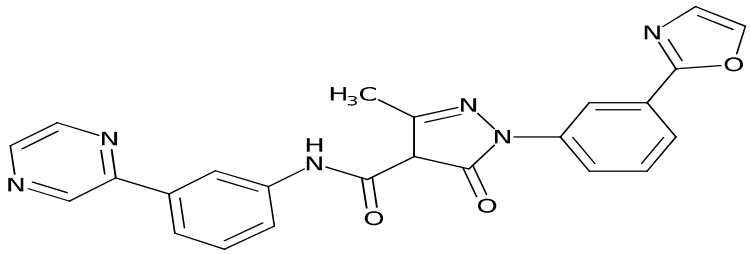
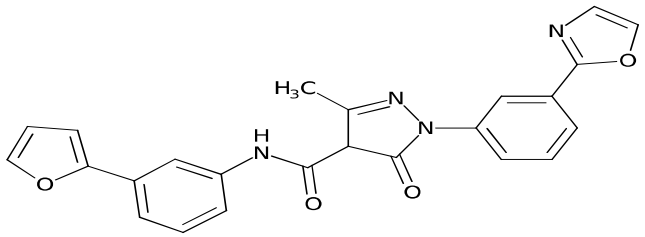
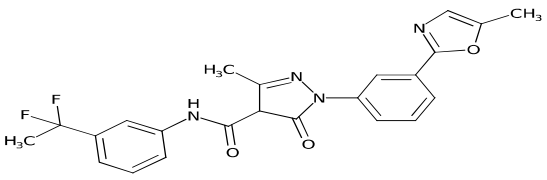
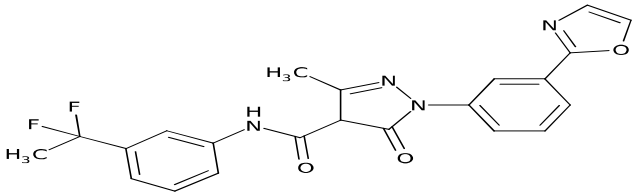
Compound name	Structure
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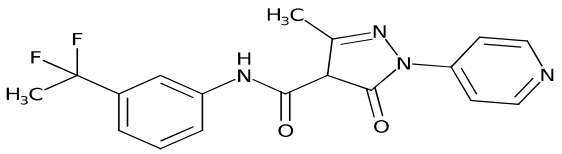
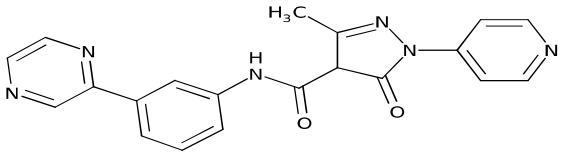
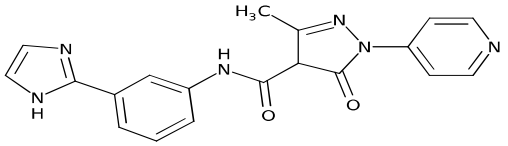
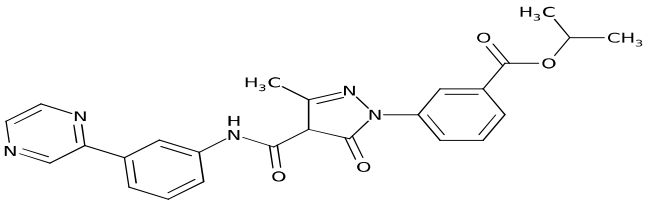
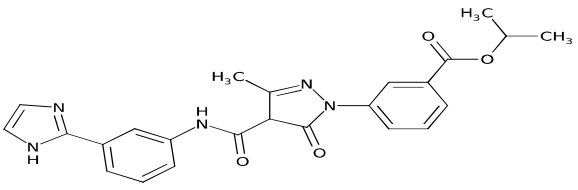
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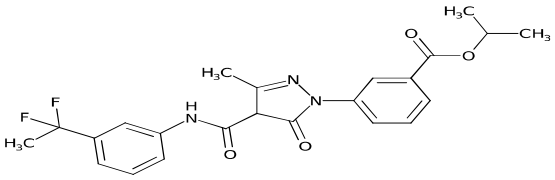
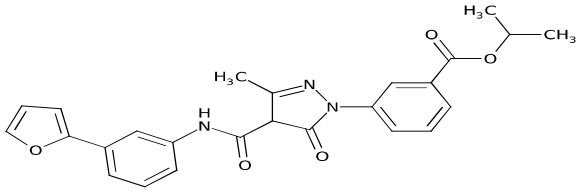
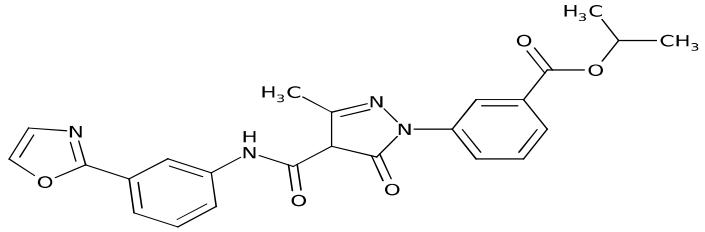
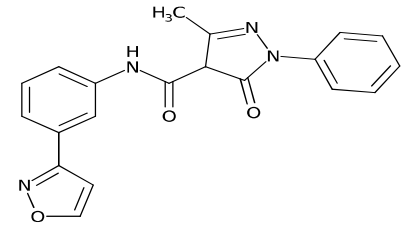
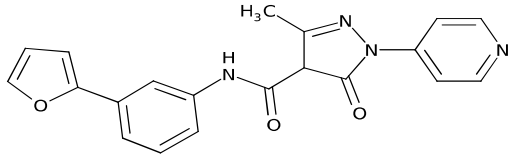
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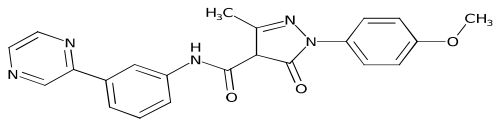
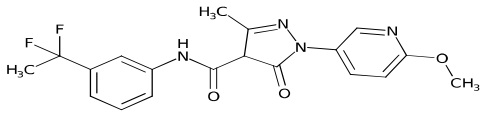
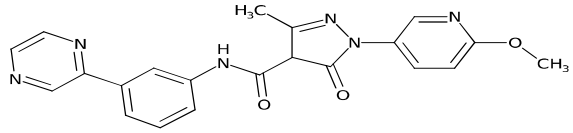
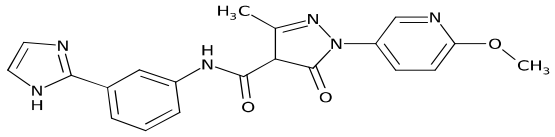
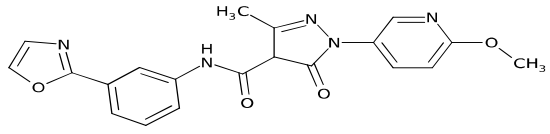
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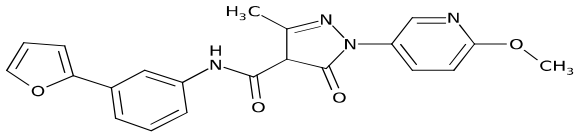
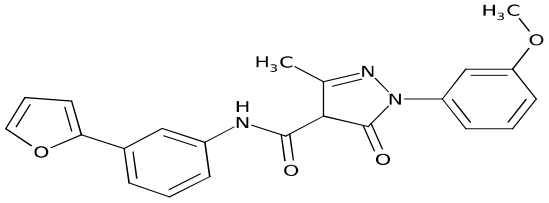
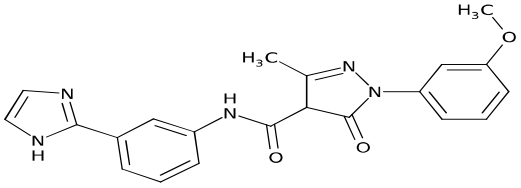
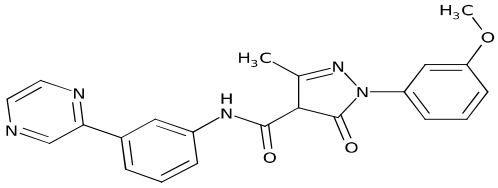
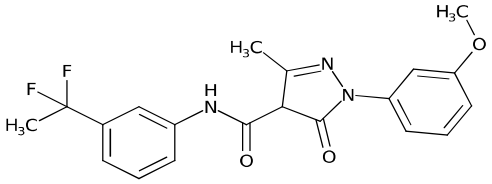
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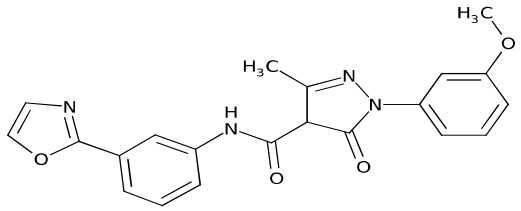
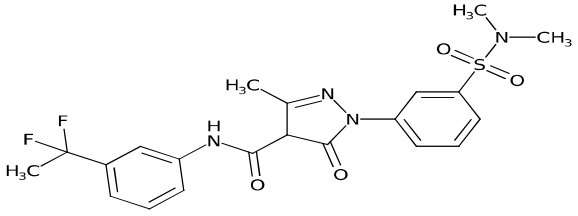
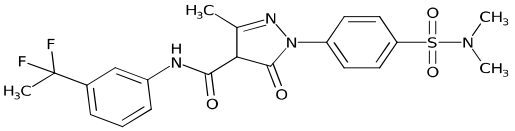
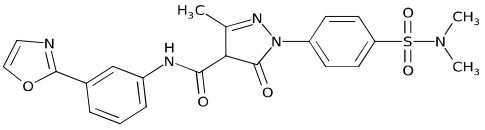
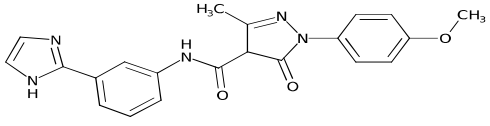
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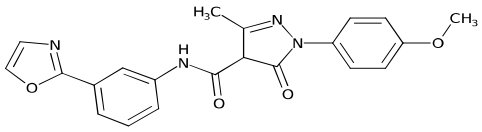
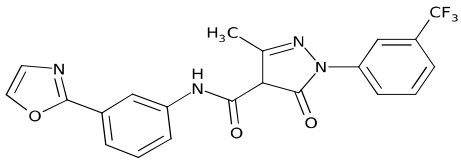
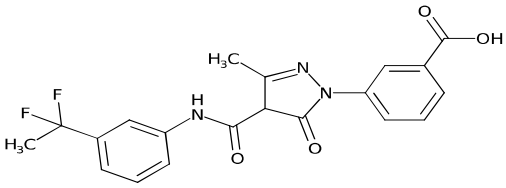
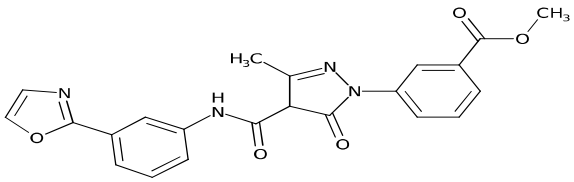
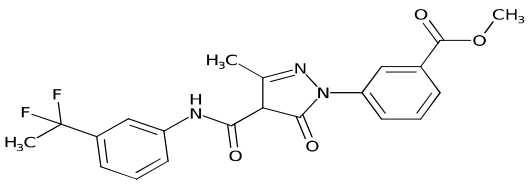
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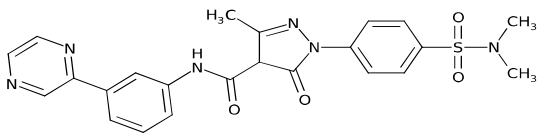
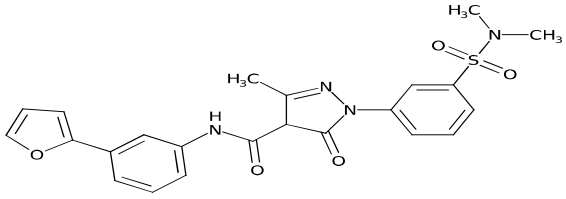
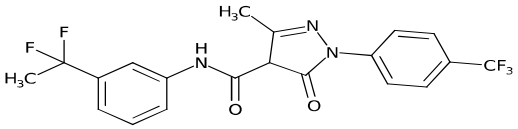
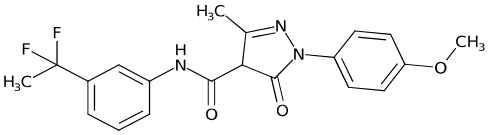
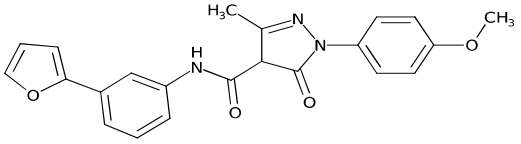
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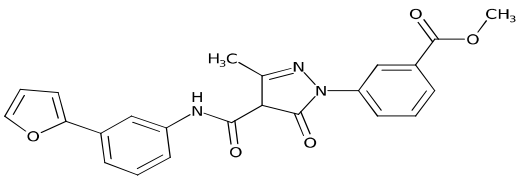
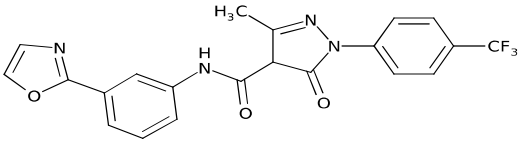
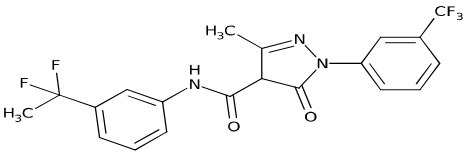
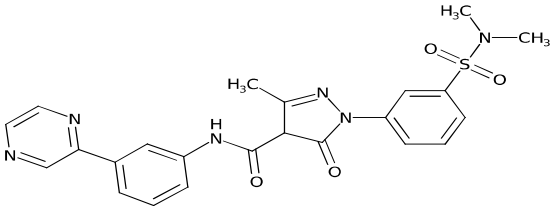
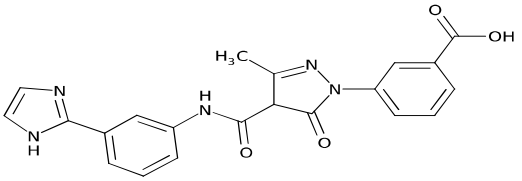
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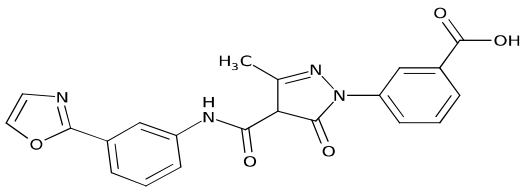
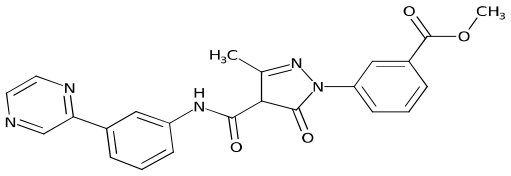
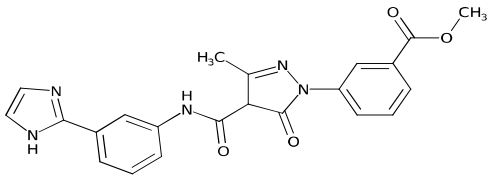
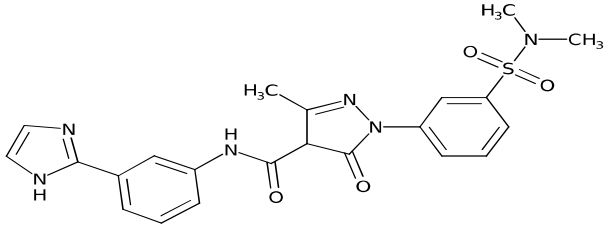
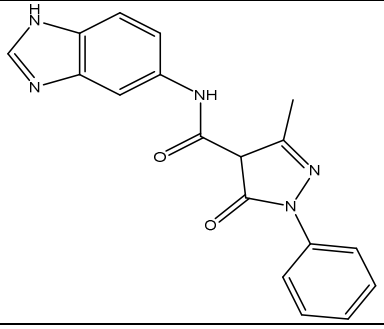
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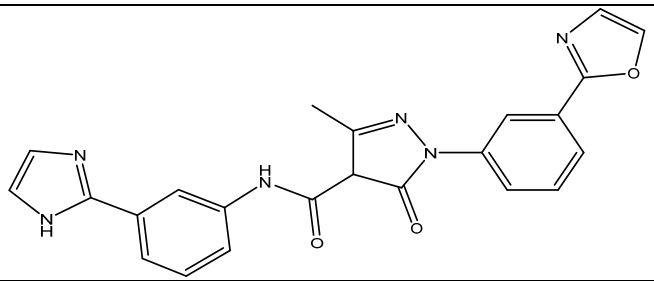
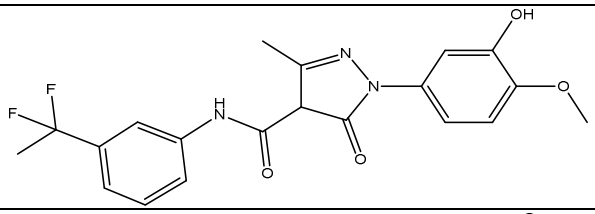
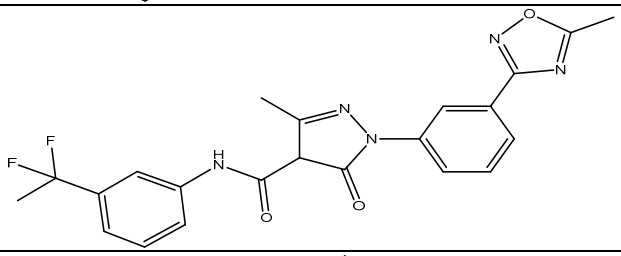
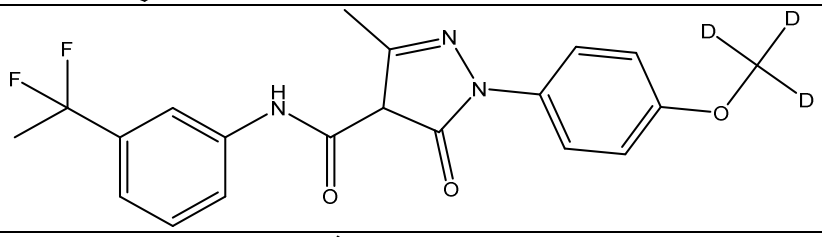
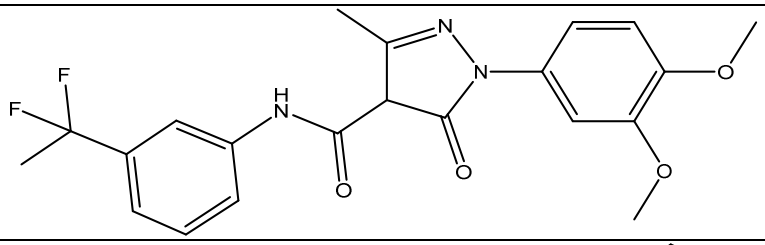
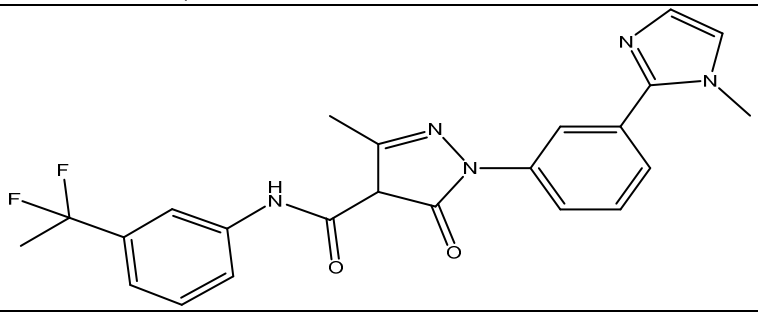
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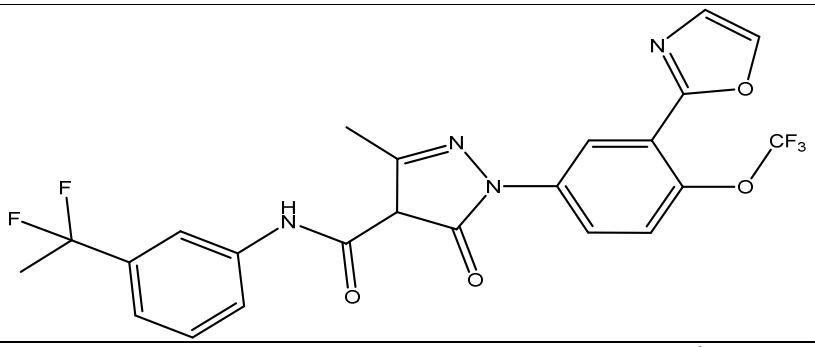
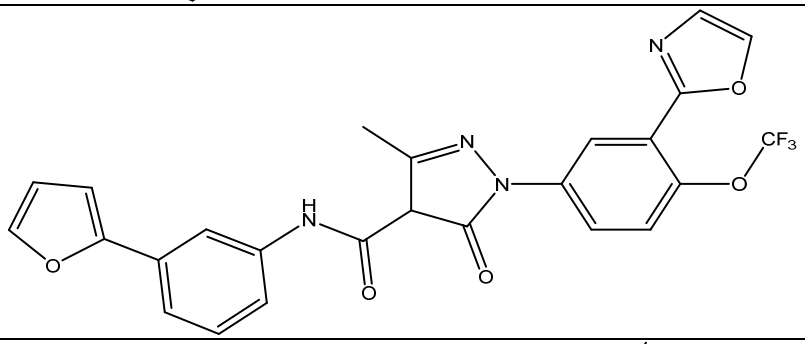
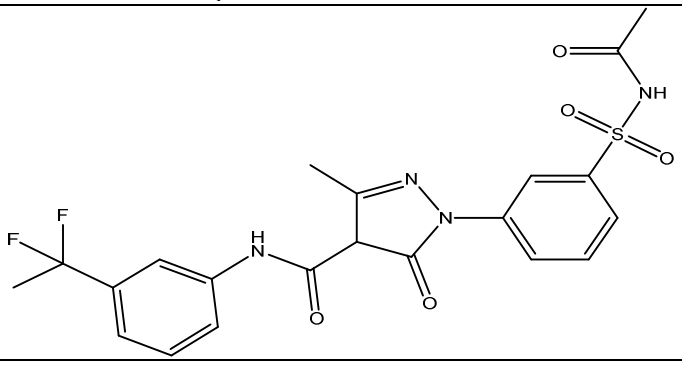
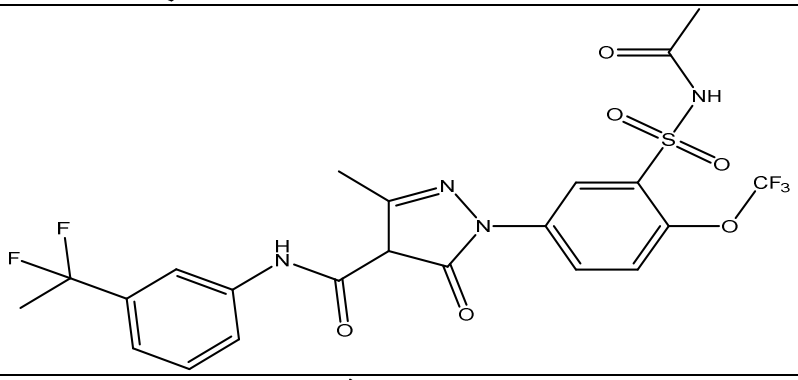
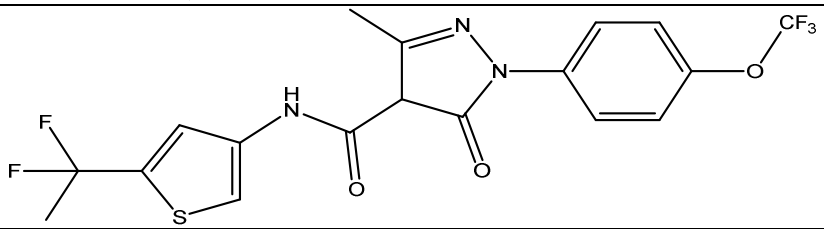
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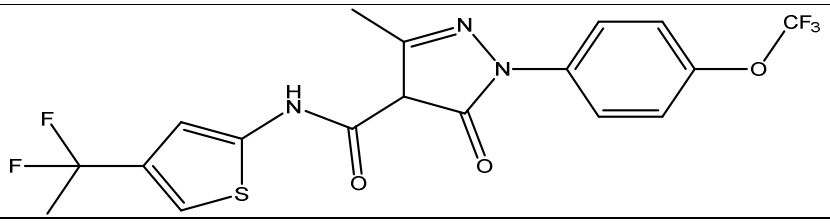
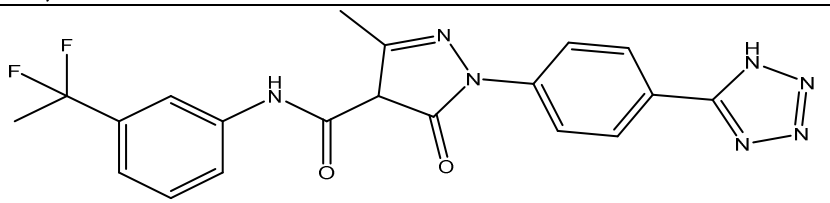
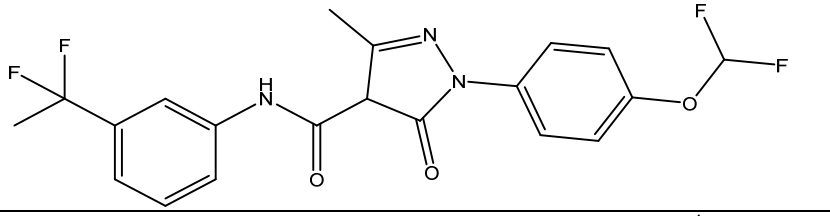
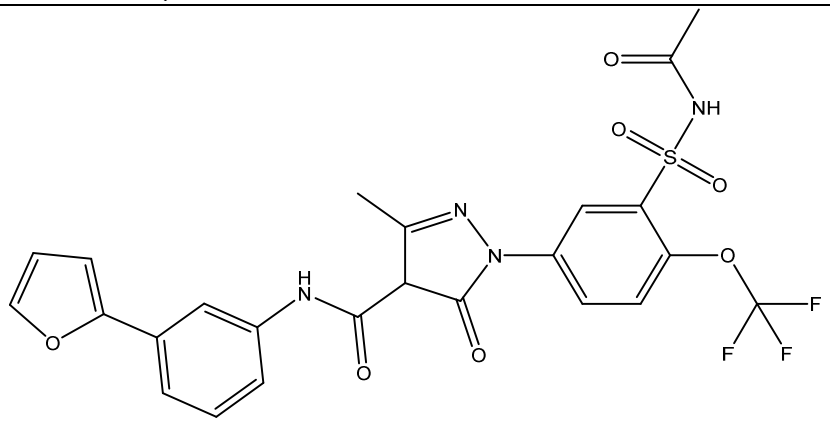
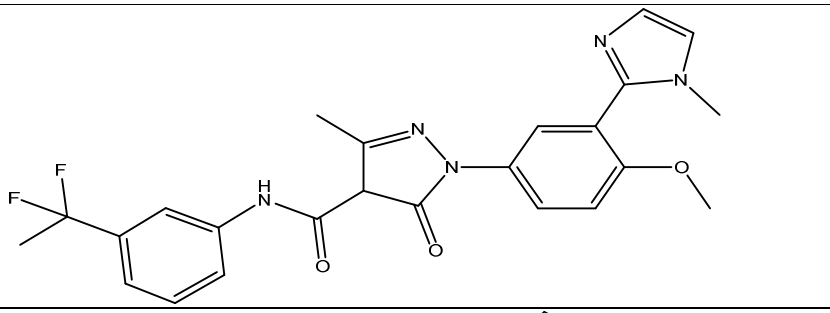
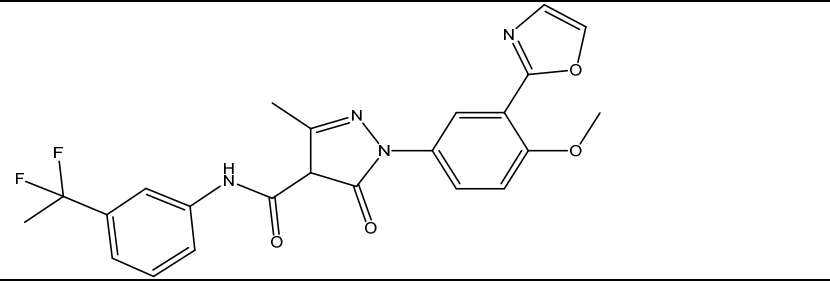
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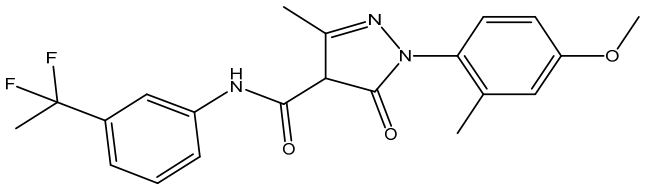
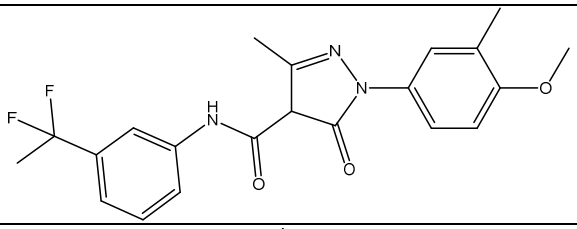
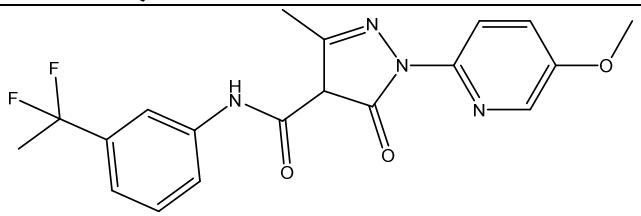
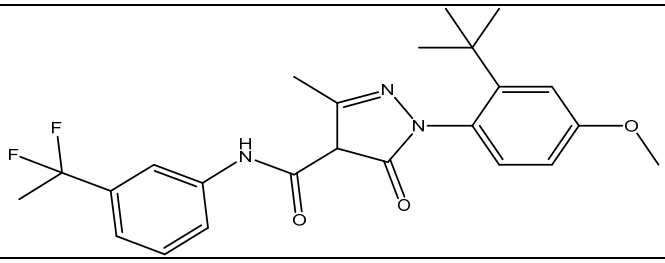
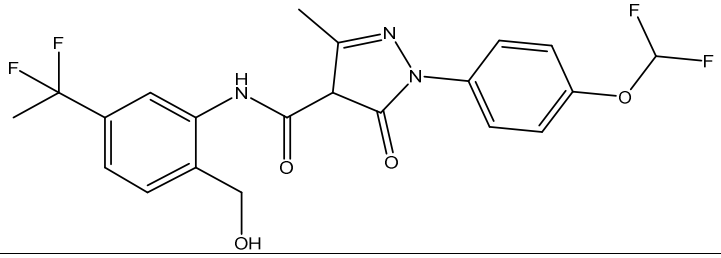
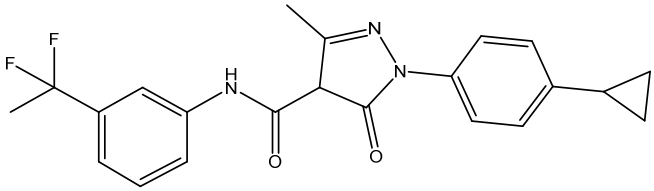
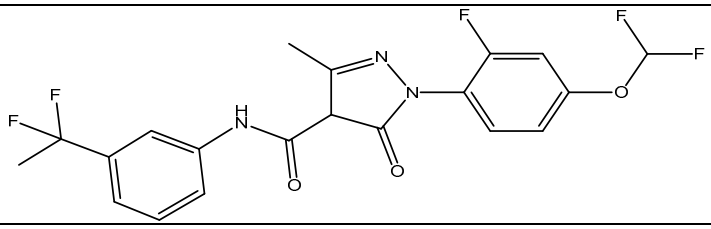
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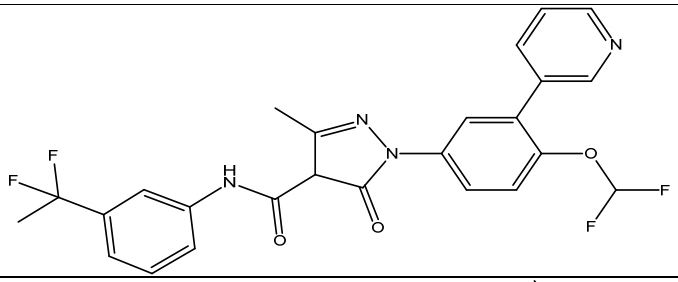
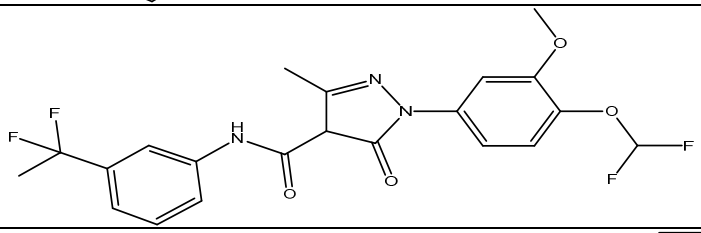
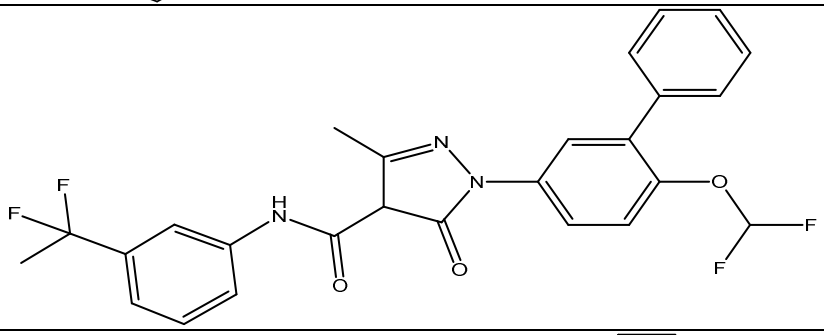
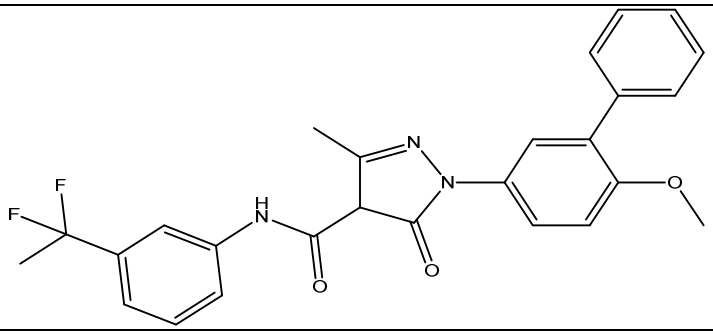
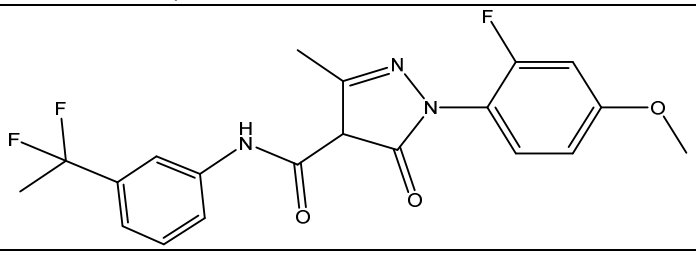
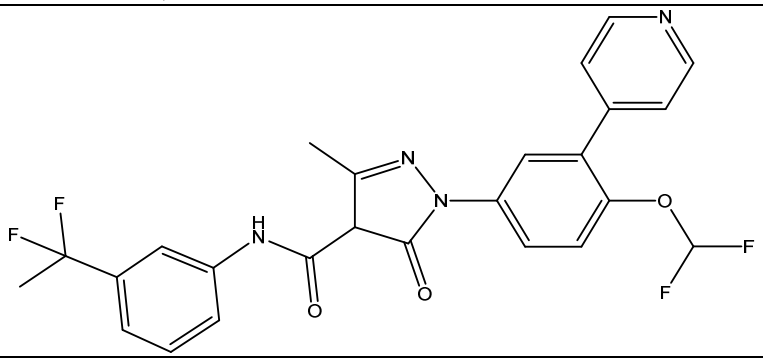
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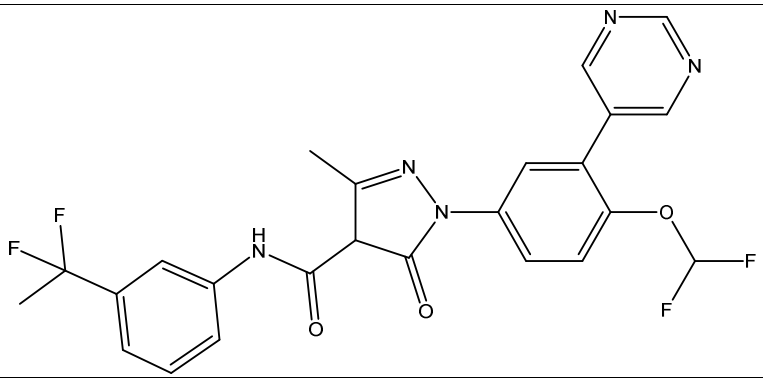
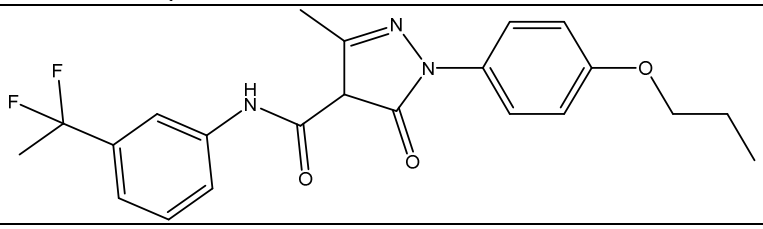
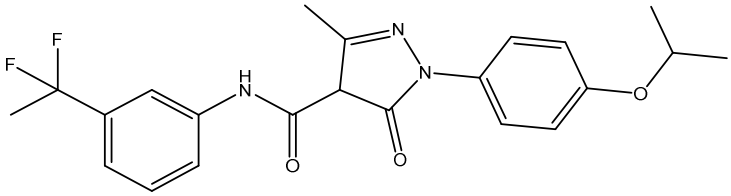
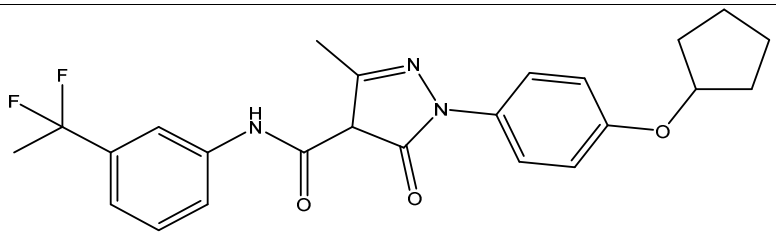
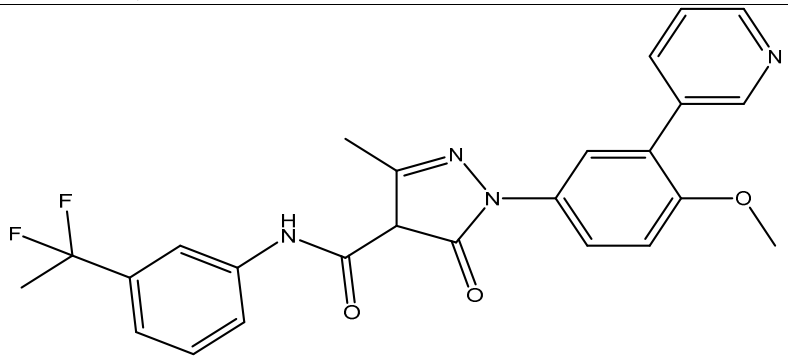
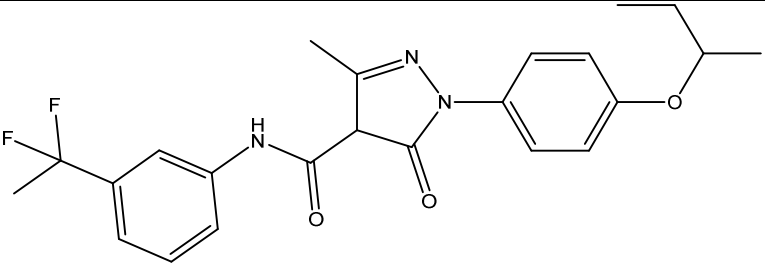
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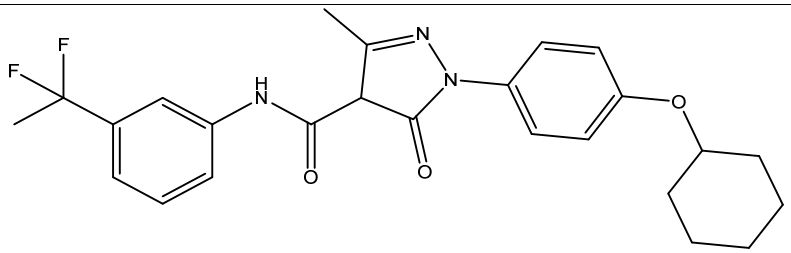
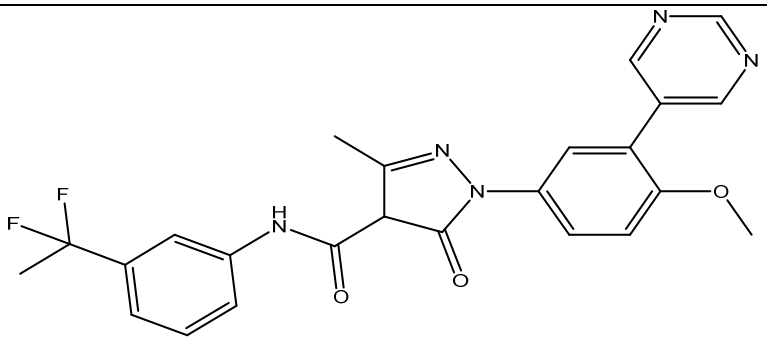
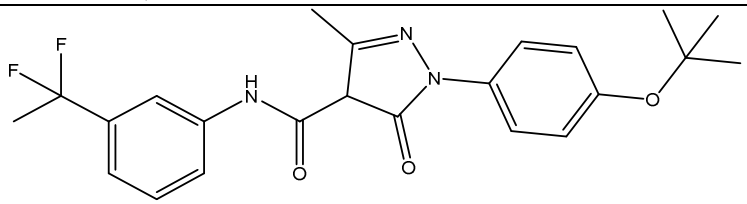
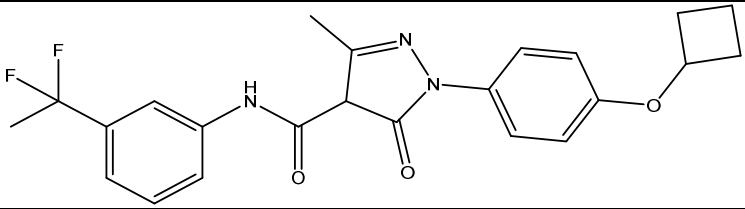
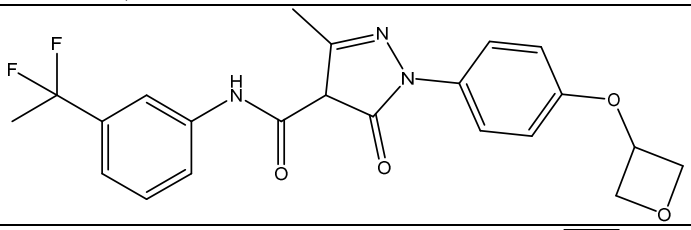
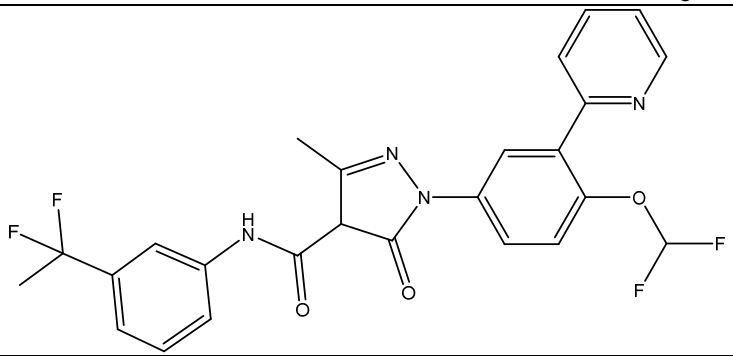
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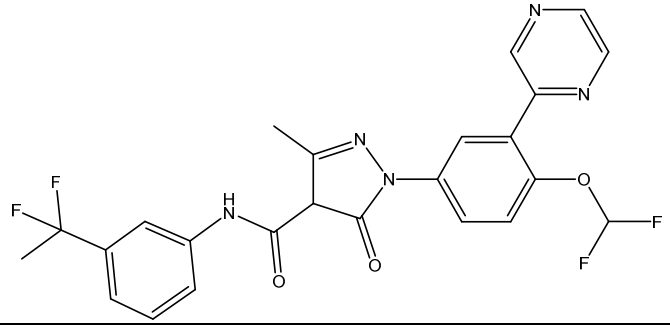
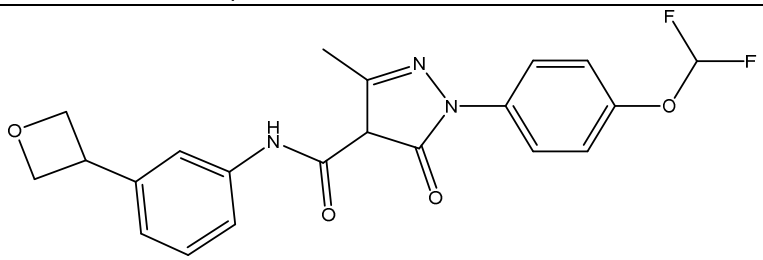
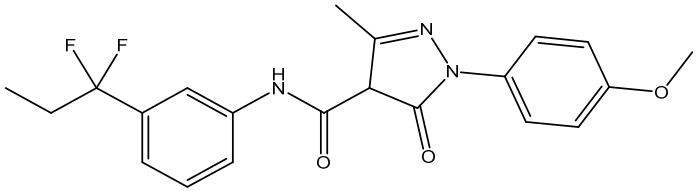
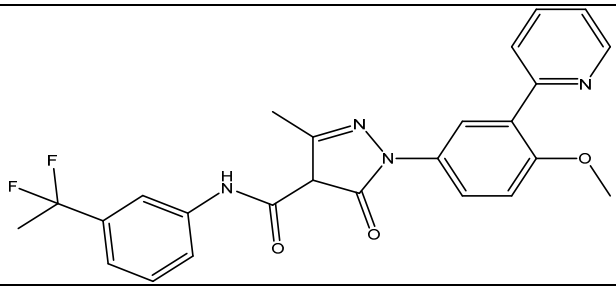
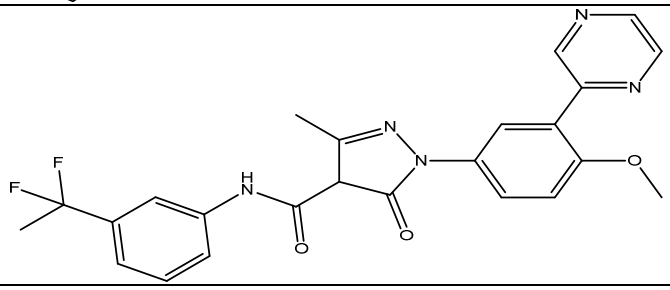
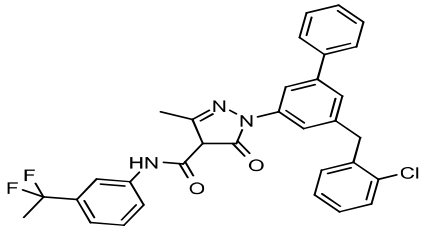
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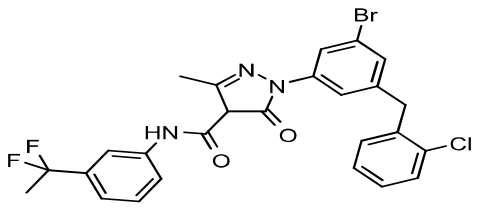
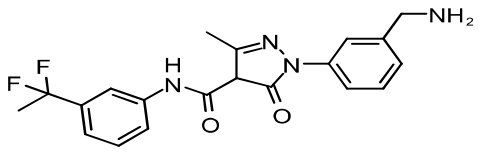
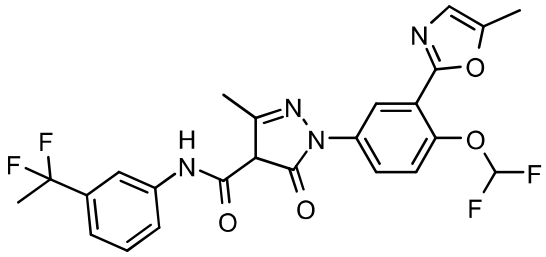
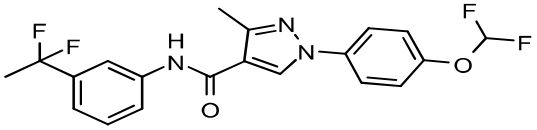
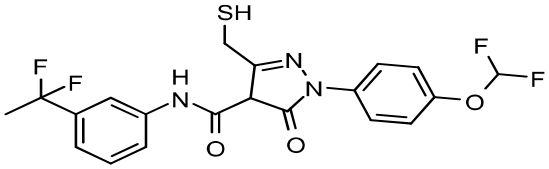
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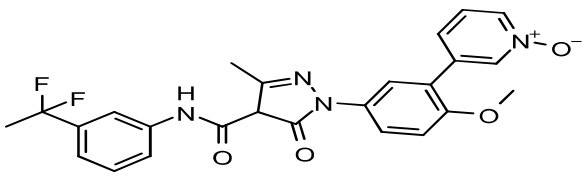
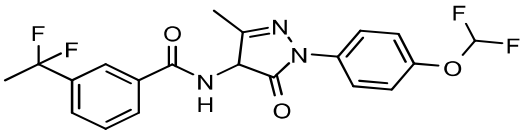
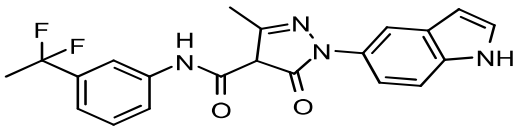
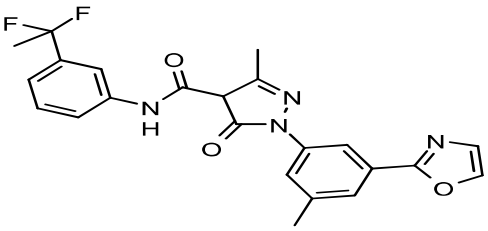
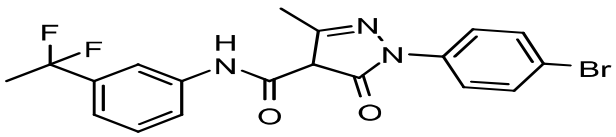
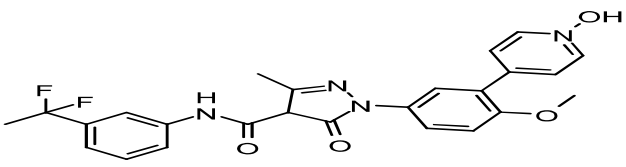
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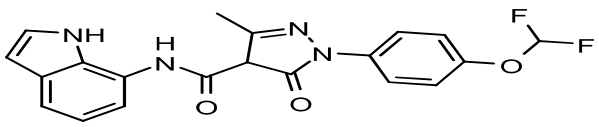
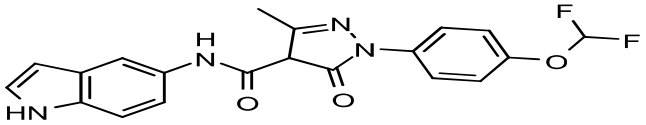
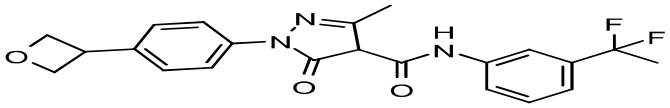
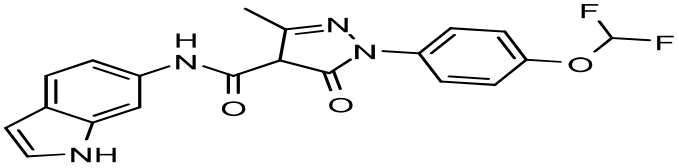
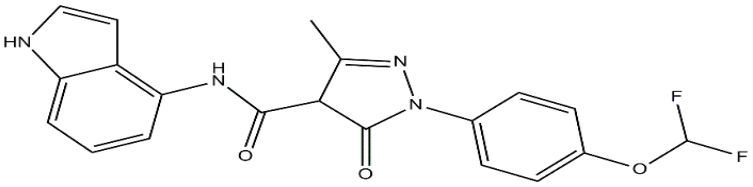
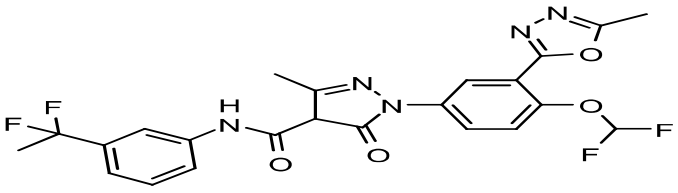
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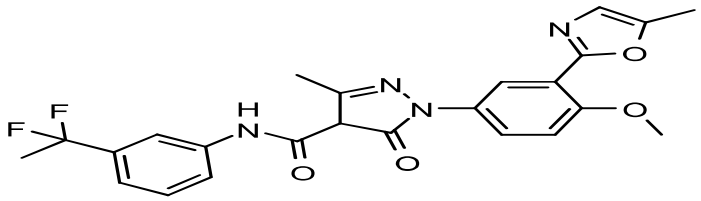
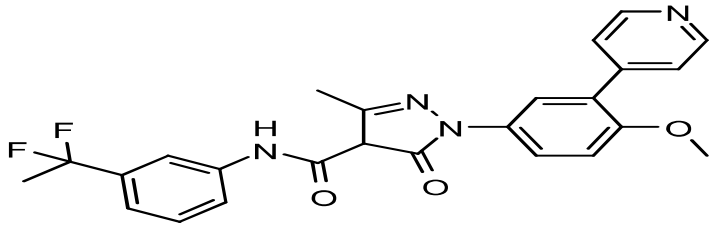
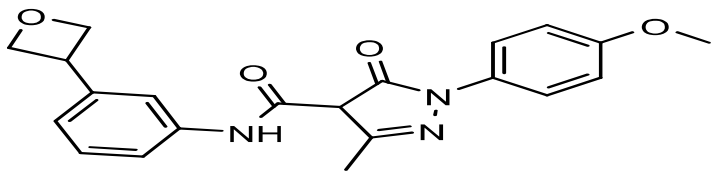
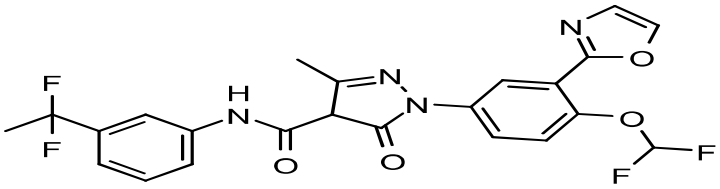
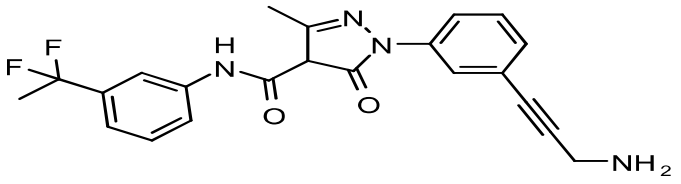
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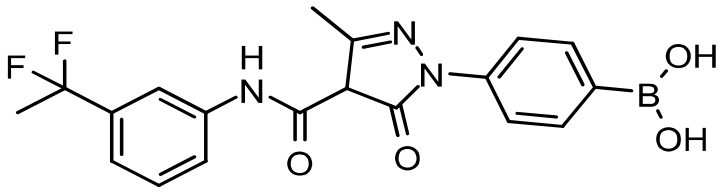
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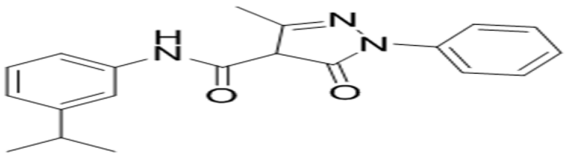
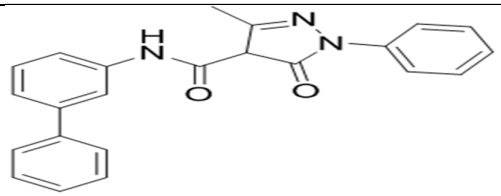
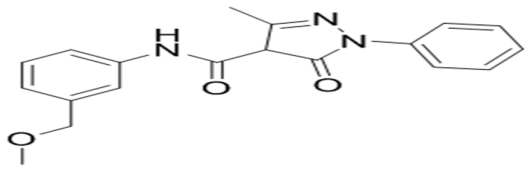
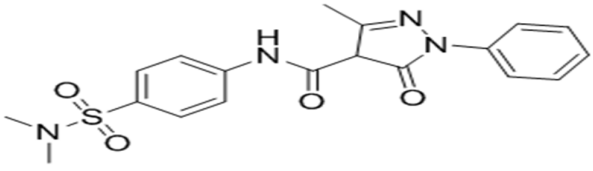
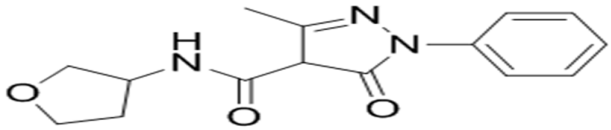
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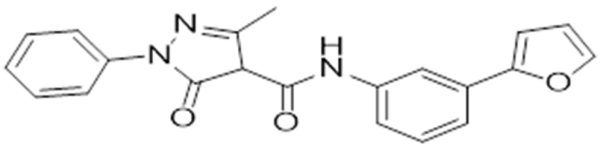
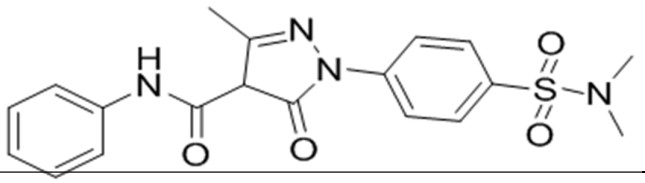
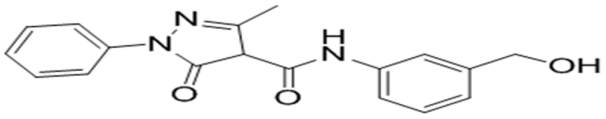
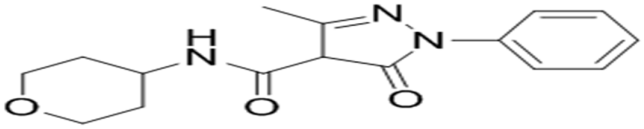
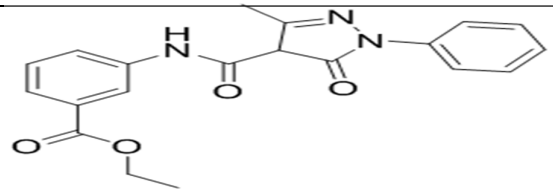
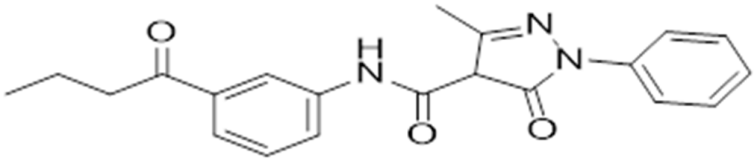
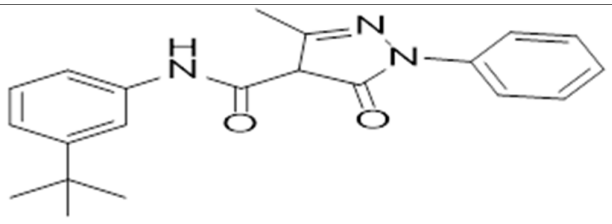
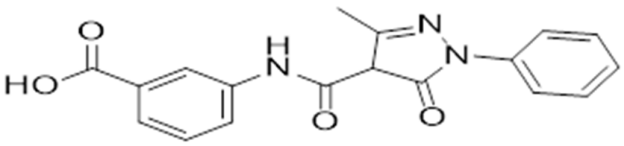
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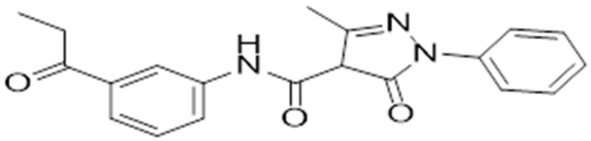
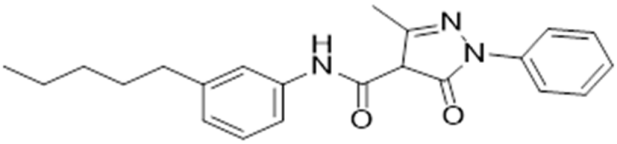
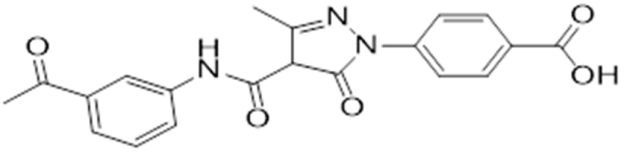
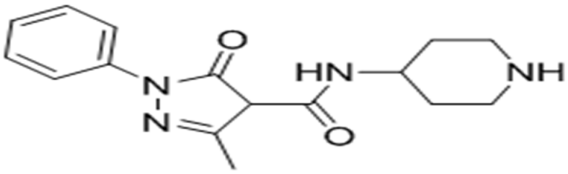
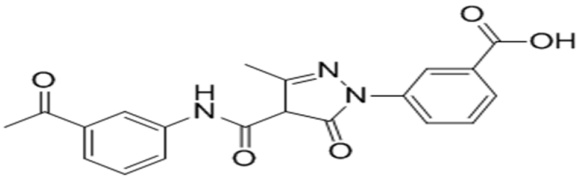
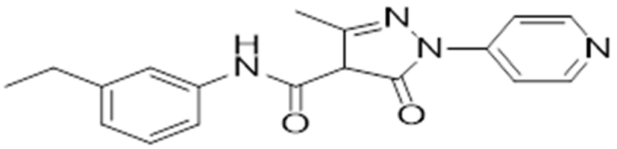
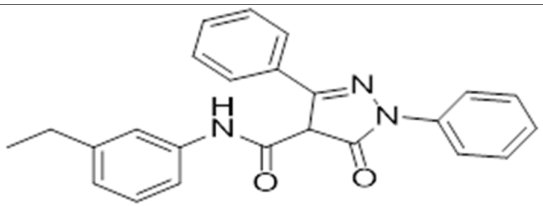
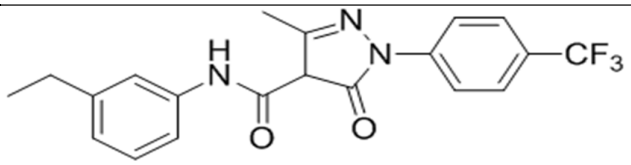
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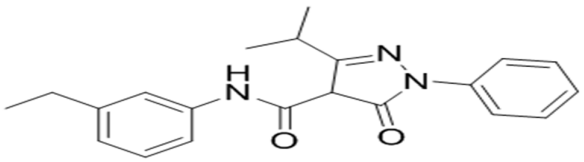
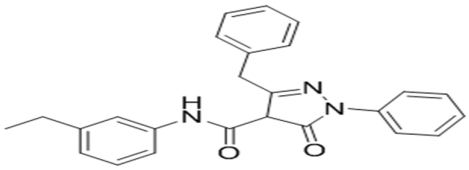
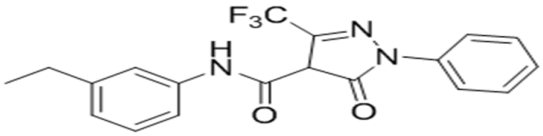
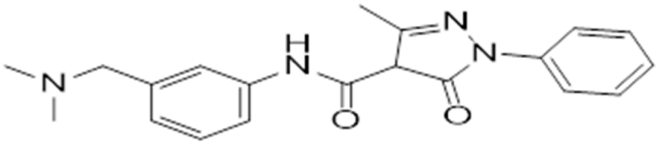
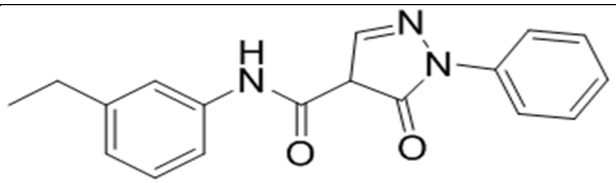
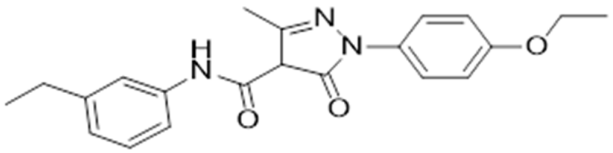
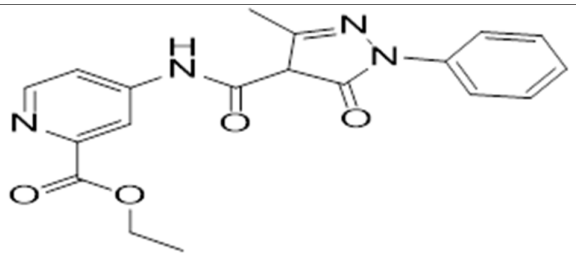
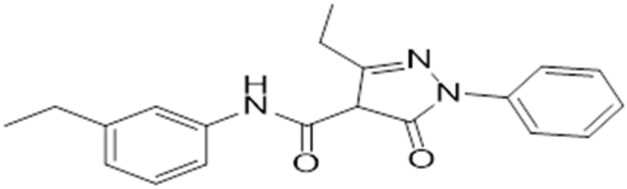
or its pharmaceutically acceptable salt, optical isomer, tautomer, hydrate, *N*-oxide, isotopic variants (e.g., deuterated analog), pharmaceutical product or any combination thereof.

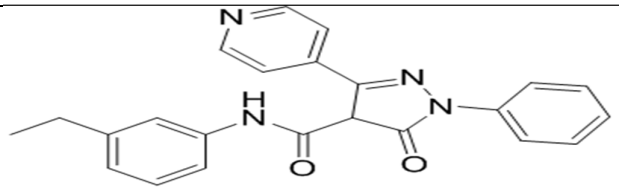
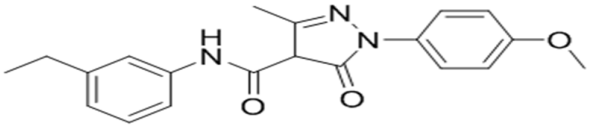
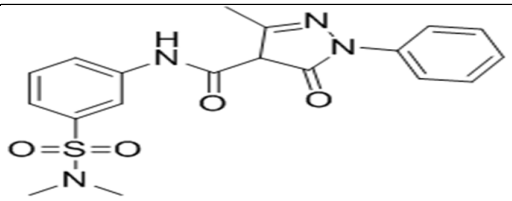
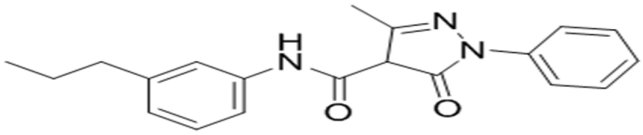
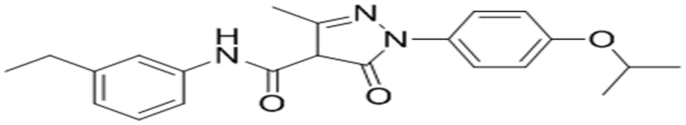
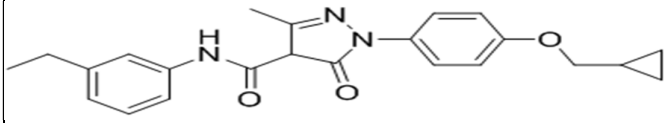
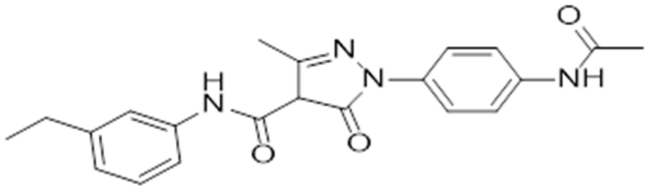
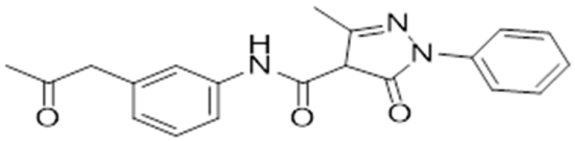
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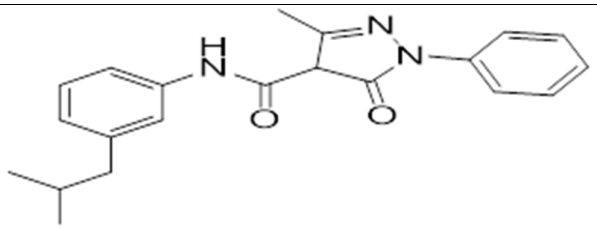
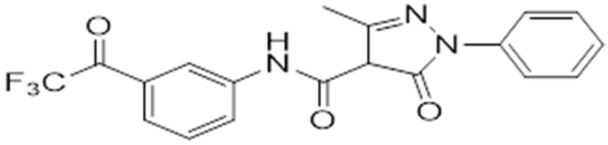
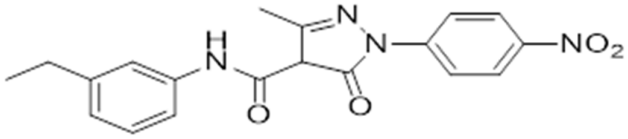
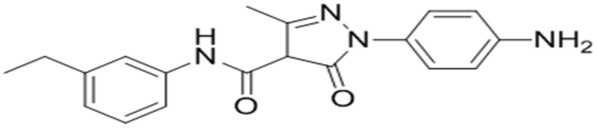
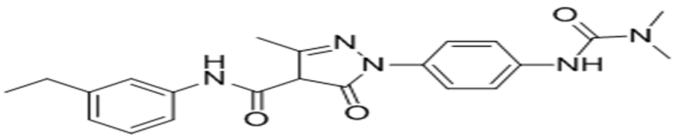
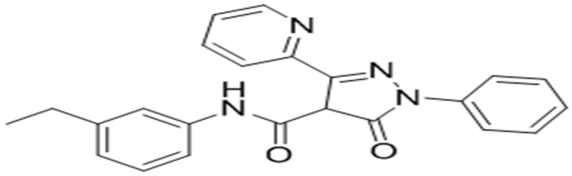
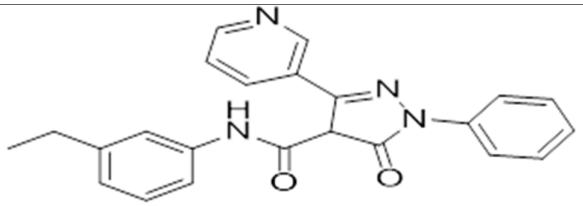
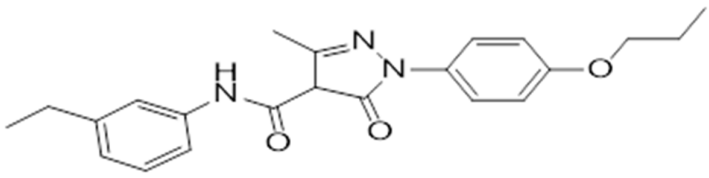
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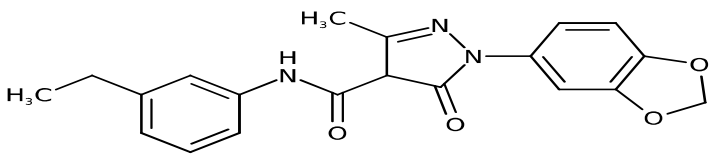
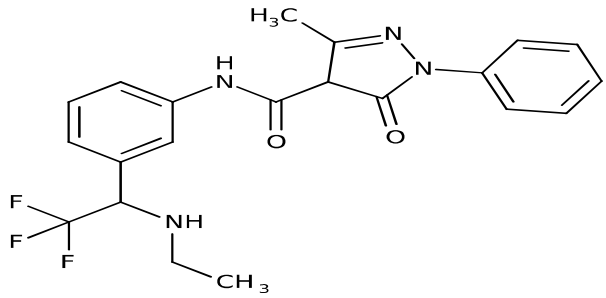
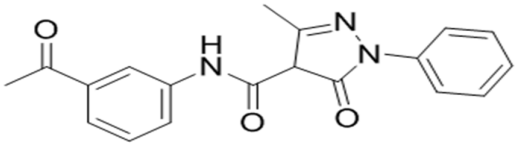
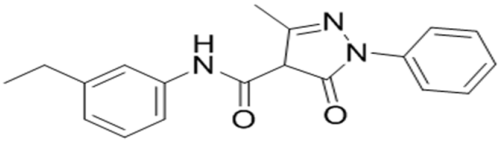
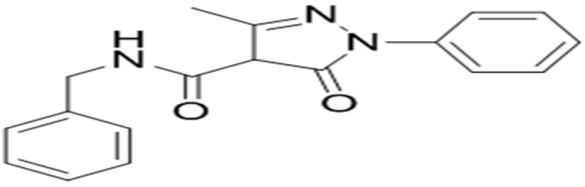
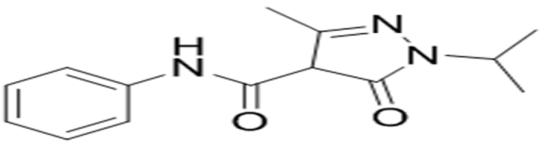
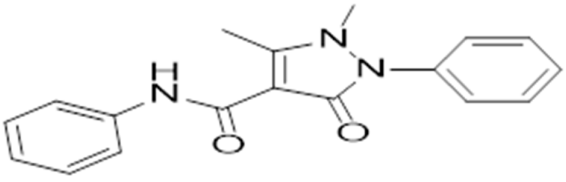
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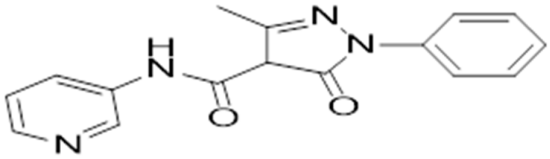
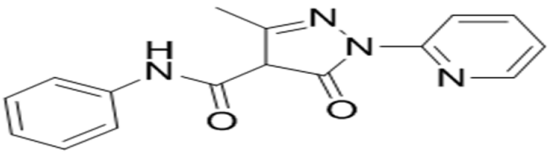
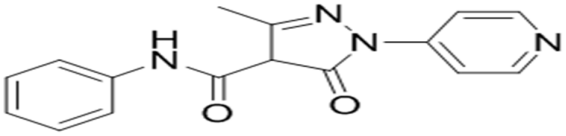
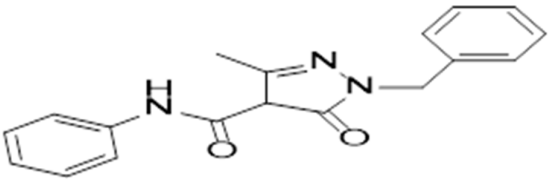
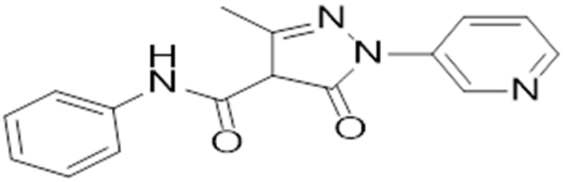
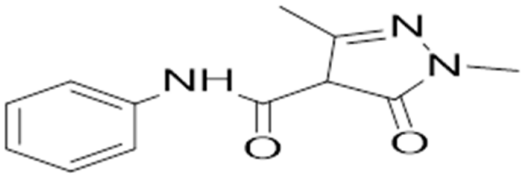
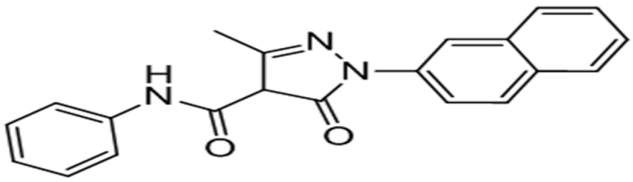
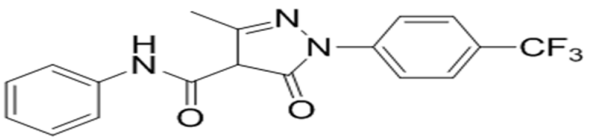
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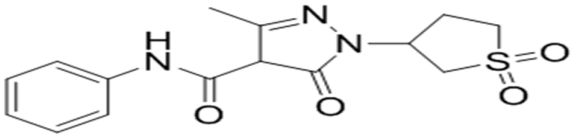
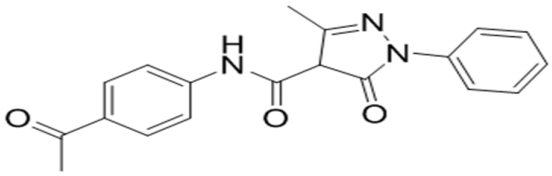
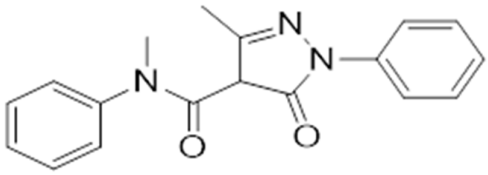
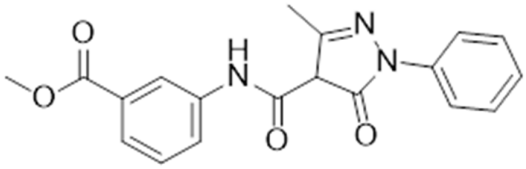
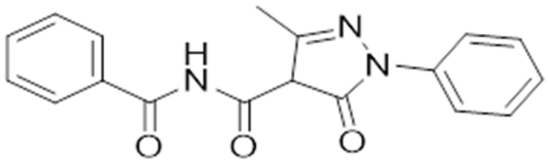
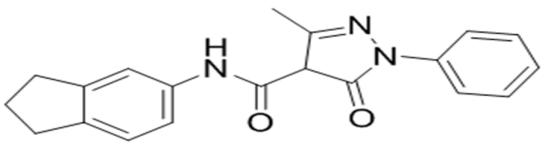
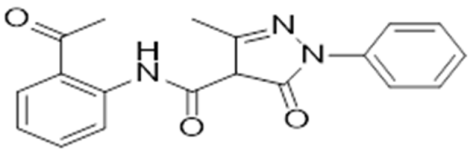
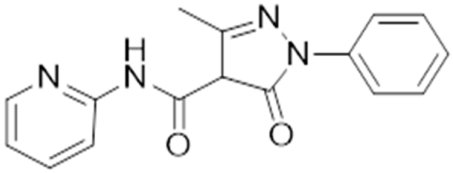
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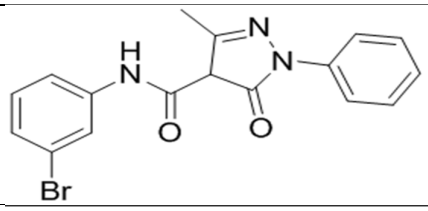
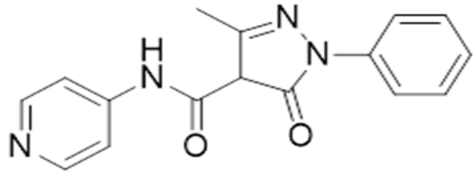
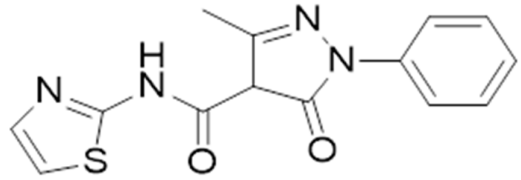
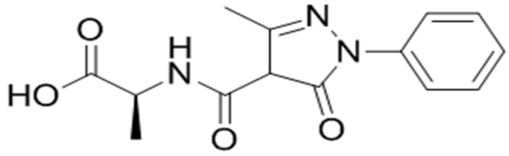
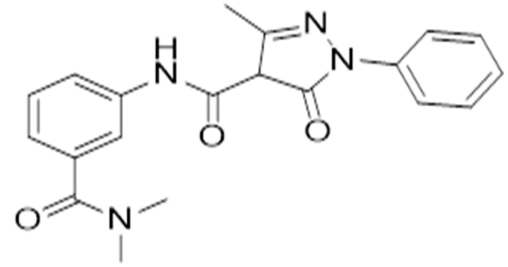
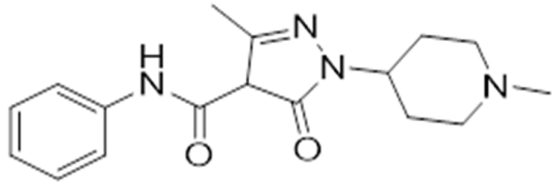
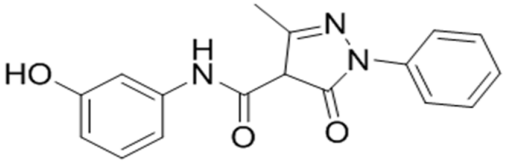
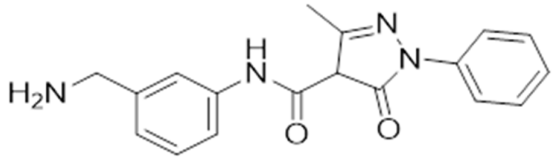
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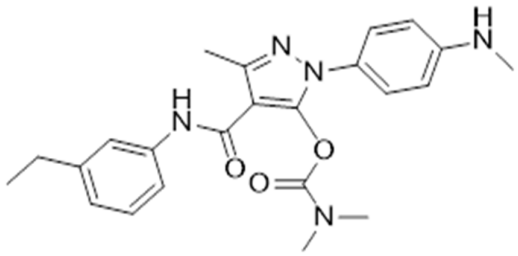
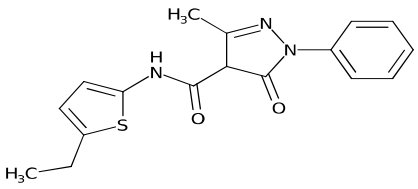
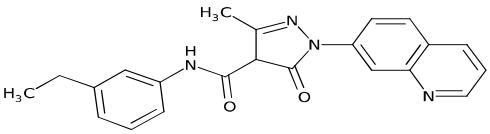
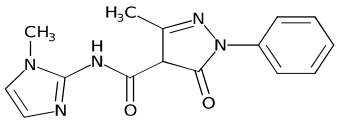
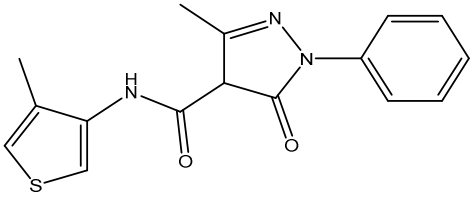
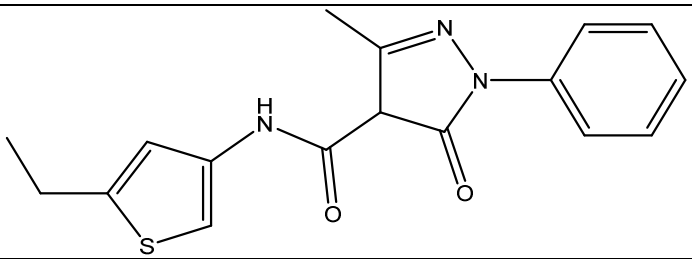
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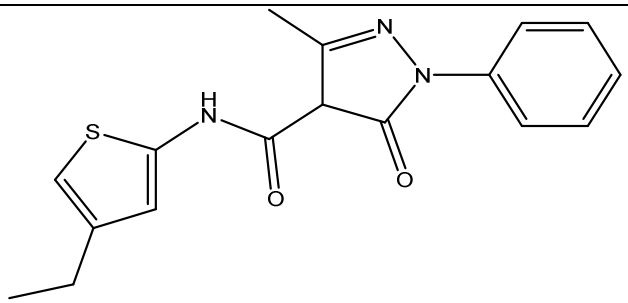
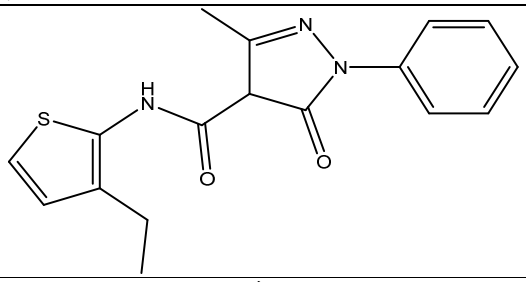
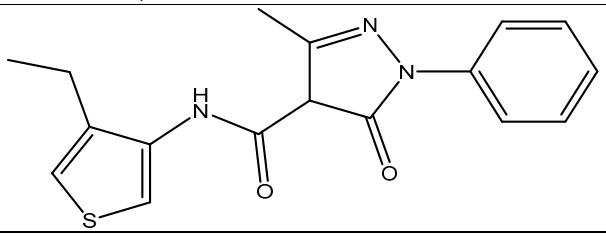
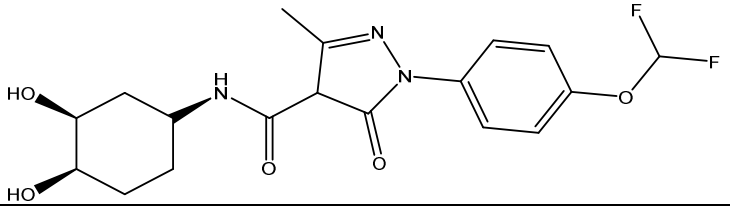
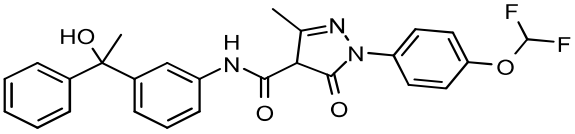
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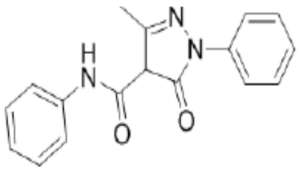
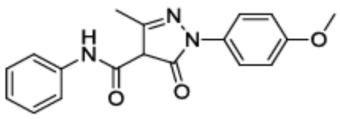
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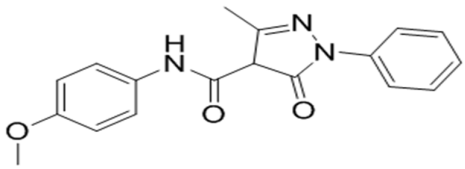
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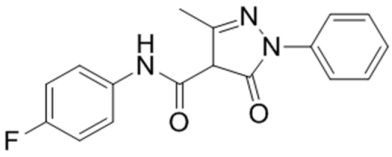
5. The compound of any one of the preceding claims, wherein the compound is an Acyl-CoA Synthetase Short-Chain Family Member 2 (ACSS2) inhibitor.

6. Use of a compound represented by the following structures:

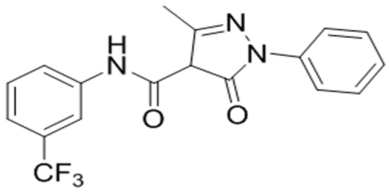
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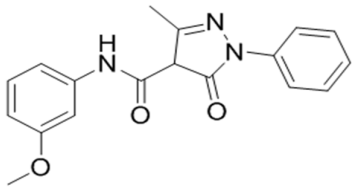
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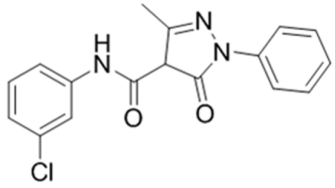
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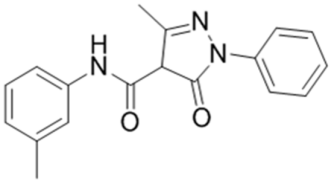
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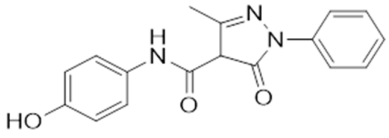
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in the manufacture of a medicament for:

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting cancer in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting human alcoholism in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a viral infection, such as human cytomegalovirus (HCMV) infection, in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting alcoholic steatohepatitis (ASH) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non alcoholic fatty liver disease (NAFLD) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non-alcoholic steatohepatitis (NASH) in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a metabolic disorder such as obesity, hepatic steatosis and fatty liver disease in a subject;

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a neuropsychiatric disease or disorder such as anxiety, depression, schizophrenia, autism and post-traumatic stress disorder in a subject; and/or

treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting an autoimmune disease or disorder in a subject.

7. A pharmaceutical composition comprising a compound according to any one of claims 1 to 5 and a pharmaceutically acceptable carrier.
8. A compound according to any of claims 1-5 for use as a medicament.
9. Use of a compound according to any of claims 1-5 in the manufacture of a medicament for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting cancer in a subject.
10. The use according to claim 9, wherein the cancer is selected from hepatocellular carcinoma, melanoma (e.g., BRAF mutant melanoma), glioblastoma, breast cancer (e.g., invasive ductal carcinomas of the breast, triple-negative breast cancer), prostate cancer, liver cancer, brain cancer, ovarian cancer, lung cancer, Lewis lung carcinoma (LLC), colon carcinoma, pancreatic cancer, renal cell carcinoma and mammary carcinoma, and/or

    wherein the cancer is early cancer, advanced cancer, invasive cancer, metastatic cancer, drug resistant cancer or any combination thereof, and/or

    wherein the subject has been previously treated with chemotherapy, immunotherapy, radiotherapy, biological therapy, surgical intervention, or any combination thereof, and/or

    wherein the compound is to be administered in combination with an anti-cancer therapy, such as chemotherapy, immunotherapy, radiotherapy, biological therapy, surgical intervention, or any combination thereof.

11. Use of a compound according to any of claims 1-5 in the manufacture of a medicament for suppressing, reducing or inhibiting tumour growth in a subject.
12. The use according to claim 11, wherein the tumor growth is enhanced by increased acetate uptake by cancer cells of said cancer, for example:

    wherein the increased acetate uptake is mediated by ACSS2, and/or

    wherein the tumour cells are under hypoxic stress, or

    wherein the tumor growth is suppressed due to suppression of lipid (e.g., fatty acid) synthesis and/or regulating histones acetylation and function induced by ACSS2 mediated acetate metabolism to acetyl-CoA.
13. An *in vitro* method of suppressing, reducing or inhibiting lipid synthesis and/or regulating histones acetylation and function in a cell such as a cancer cell; or

    of suppressing, reducing or inhibiting acetyl-CoA synthesis, such as ACSS2-mediated acetyl-CoA synthesis, from acetate in a cell such as a cancer cell; or

    of suppressing, reducing or inhibiting acetate metabolism, such as ACSS2-mediated acetate metabolism, in a cancer cell, optionally wherein the cancer cell is under hypoxic stress,

    the method comprising contacting the cell with a compound according to any one of claims 1 to 5.
14. An *in vitro* method of binding an ACSS2 inhibitor compound to an ACSS2 enzyme, comprising the step of contacting an ACSS2 enzyme with an ACSS2 inhibitor compound according to any one of claims 1 to 5, in an amount effective to bind the ACSS2 inhibitor compound to the ACSS2 enzyme.
15. Use of a compound according to any one of claims 1 to 5 in the manufacture of a medicament for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting human alcoholism in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a viral infection, such as human cytomegalovirus (HCMV) infection, in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting alcoholic steatohepatitis (ASH) in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non alcoholic fatty liver disease (NAFLD) in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting non-alcoholic steatohepatitis (NASH) in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a metabolic disorder such as obesity, hepatic steatosis and fatty liver disease in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting a neuropsychiatric disease or disorder such as anxiety, depression, schizophrenia, autism and post-traumatic stress disorder in a subject, or

    for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting inflammatory condition in a subject, or

for treating, suppressing, reducing the severity, reducing the risk of developing or inhibiting an autoimmune disease or disorder in a subject.