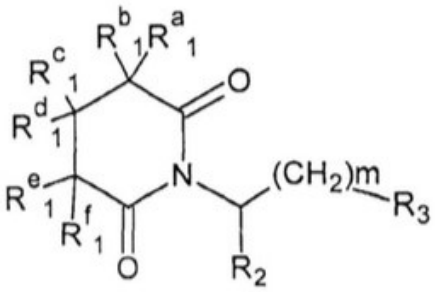
CLAIMS

1. A compound of general formula I:



wherein m is an integer from ~~1~~ 0 to 2;

R^{a}_{1}, R^{b}_{1}, R^{c}_{1}, R^{d}_{1}, R^{e}_{1}, and R^{f}_{1}, each independently represents hydrogen, methyl~~C_1-C_6alkyl~~; $-NH_2$, ~~-NHC_1-C_6alkyl,~~ or hydroxyl~~, or C_1-C_6alkoxy~~;

R_2 is hydrogen, methyl~~C_1-C_6alkyl~~, -C(O)OH, -C(O)OC_1-~~C_6alkyl~~C_2alkyl;

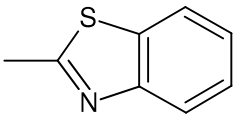
R_3 is:

1) a 5-membered saturated or unsaturated heterocyclic group comprising from 1 to 4 heteroatoms selected from N, O and S, optionally substituted with 1 to 3 substituents selected from Cl, C_1-C_4alkyl, methoxy, -C(O)OH, -NHC(O)CH_3, phenyl, or pyridinyl, wherein said 5-membered saturated or unsaturated heterocyclic group is selected from the group consisting of imidazol-1-yl, imidazol-2-yl, imidazol-4-yl, imidazol-5-yl, isothiazol-3-yl, isothiazol-4-yl, isothiazol-5-yl, oxazol-2-yl, oxazol-4-yl, oxazol-5-yl, 1,2,5-thiadiazol-3-yl, 1,2,5-oxadiazol-3-yl, and 1,2,4-oxadiazol-5-yl~~halogen, C1-C6alkyl, C1-C6alkoxy, -C(O)OH, -C(O)OC1-C6alkyl, -NHC(O)C1-C6alkyl, phenyl, or pyridinyl~~;

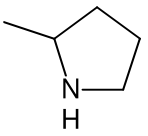
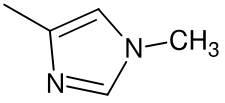
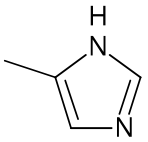
~~2) a 6-membered saturated or unsaturated heterocyclic group comprising from 1 to 2 heteroatoms selected from N and O, optionally substituted with a group selected from halogen and C_1-C_6alkyl;~~

3) a 5-membered unsaturated heterocyclic group comprising from 1 ~~to 3~~or 2 heteroatoms selected from N and S, ~~optionally substituted with 1 or 2 substituents selected from C_1-C_6alkyl,~~ condensed with a 6-membered unsaturated nitrogen-containing ~~cyclic or~~ heterocyclic group~~optionally substituted with 1 or 2 substituents selected from hydroxyl, halogen or C_1-C_6alkyl~~; or

3') a group:

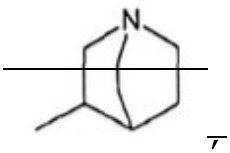


or a pharmaceutically acceptable salt thereof,

with the proviso that R_3 is not , , or .

~~4) a 6-membered unsaturated cyclic or heterocyclic group comprising from 1 to 2 nitrogen atoms, condensed with a 5- or 6-membered unsaturated heterocyclic group comprising from 1 to 3 heteroatoms selected from N and S; or~~

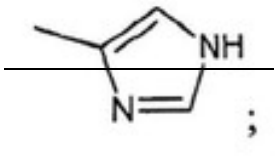
~~5) a group of the formula:~~



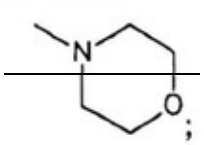
~~or a pharmaceutically acceptable salt thereof,~~

~~with a proviso that the compound is not a compound, wherein:~~

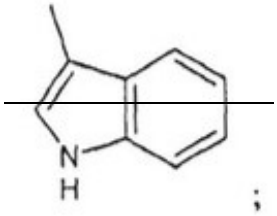
~~when m is 1, R^a_1, R^b_1, R^e_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is $-C(O)OCH_3$, R_3 is not:~~



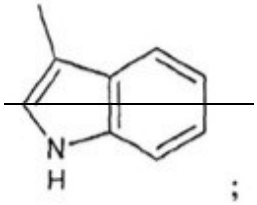
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



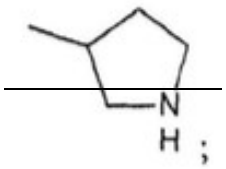
~~when m is 1, R^a_1 is an amino group and R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen, or R^c_1 is an amino group and R^a_1, R^b_1, R^c_1, R^d_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



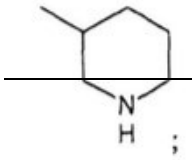
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



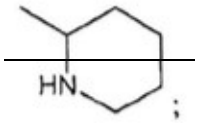
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



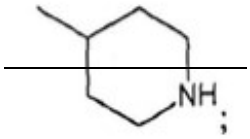
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



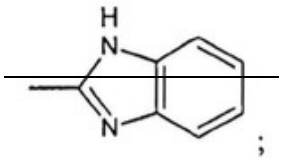
~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is hydrogen, R_3 is not:~~



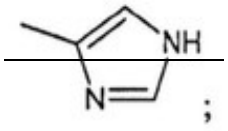
~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is hydrogen, R_3 is not:~~



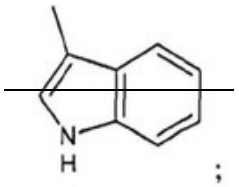
~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is hydrogen, R_3 is not:~~



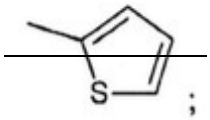
~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is $-C(O)OH$, R_3 is not:~~



~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is $-C(O)OH$, R_3 is not:~~



~~when m is 1, R^a, R^b, R^c, R^d, R^e, and R^f are hydrogen and R_2 is hydrogen, R_3 is not:~~



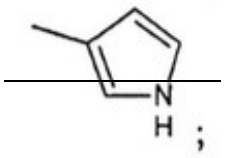
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



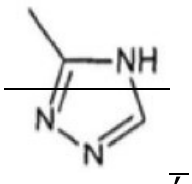
~~when m is 2, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~



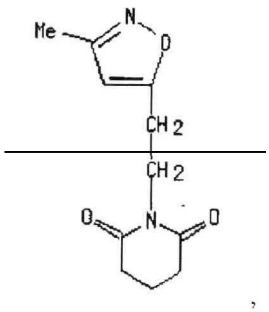
~~when m is 2, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~

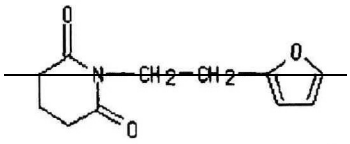


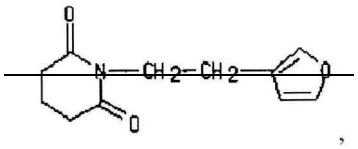
~~when m is 1, R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1 are hydrogen and R_2 is hydrogen, R_3 is not:~~

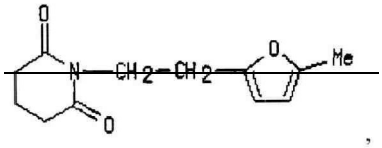


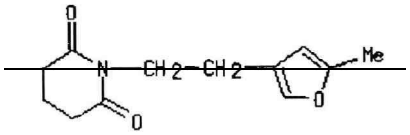
~~and with a proviso that the compound is not the following compound:~~

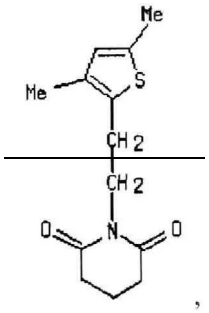


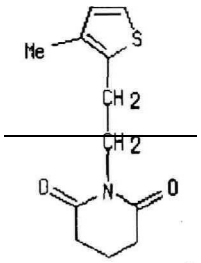

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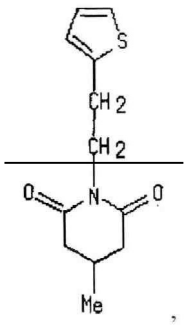

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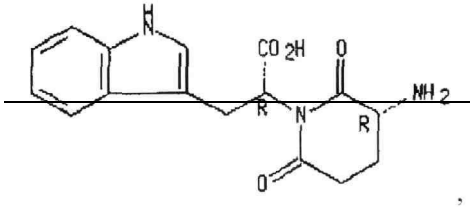

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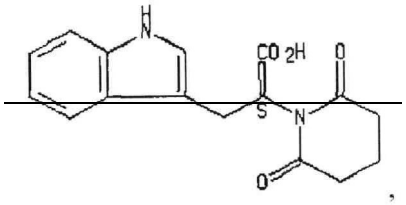

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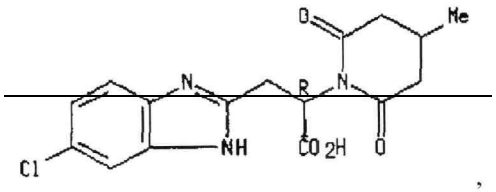

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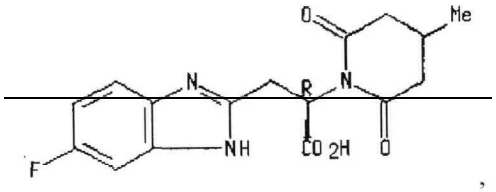

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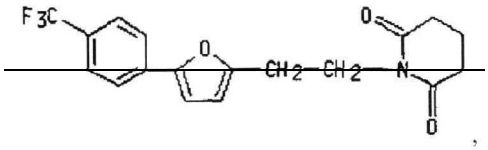

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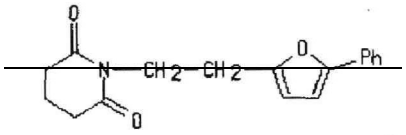

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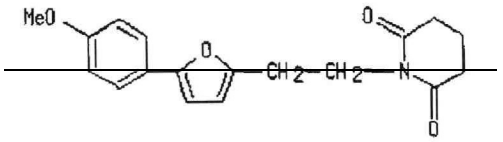

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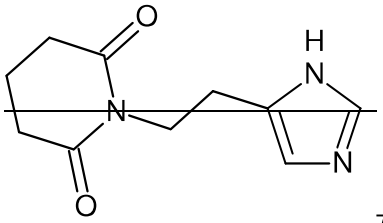

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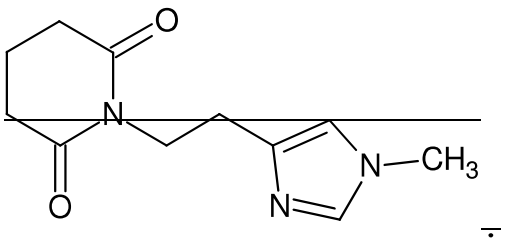

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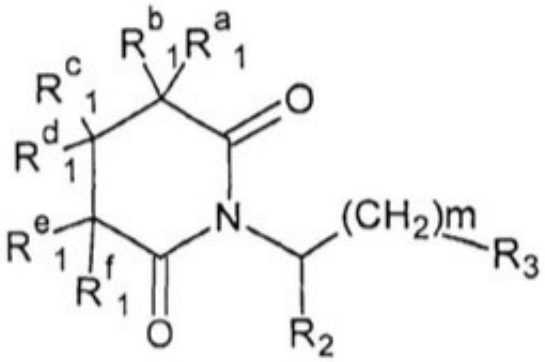

,


, and


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2. A compound of general formula I:



wherein m is an integer from 0 to 2;

~~The compound of claim 1, wherein~~

R^a_1 and R^b_1 are hydrogen, methyl, amino, or hydroxyl;

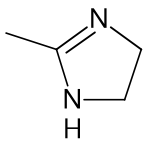
R^c_1 and R^d_1 are hydrogen, methyl, amino, or hydroxyl;

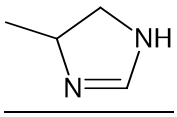
R^e_1 and R^f_1 are hydrogen or methyl;

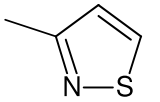
R_2~~2~~ is hydrogen, methyl, carboxyl, methoxycarbonyl, or ethoxycarbonyl;

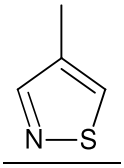
R_3~~3~~ is

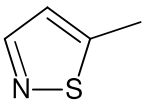
a group selected from:

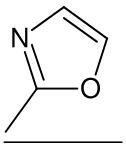


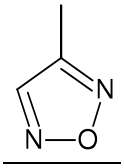
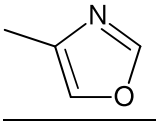
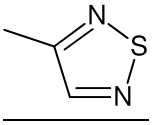
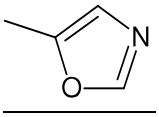
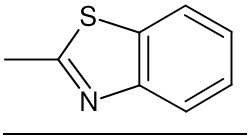
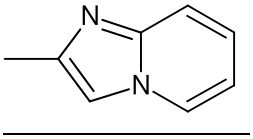
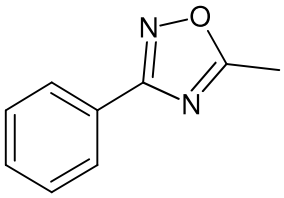
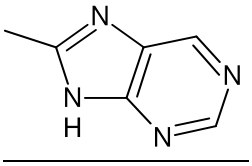
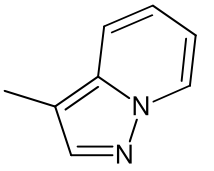
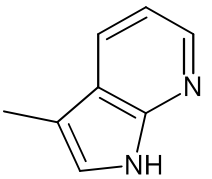
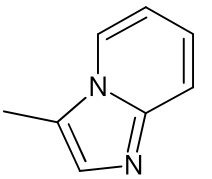
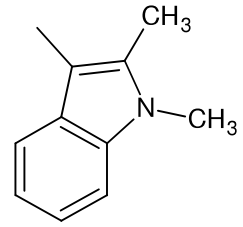




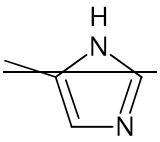
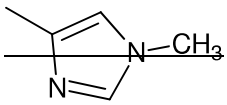
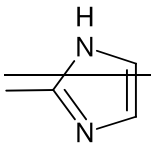
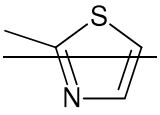
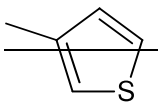
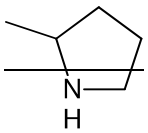
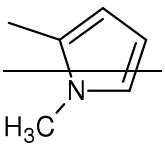
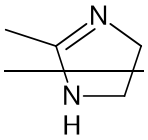
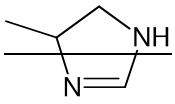
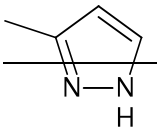
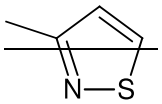
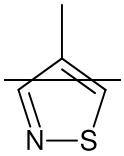
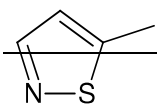
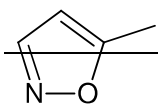
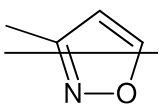


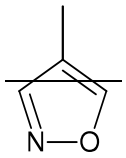
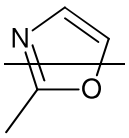
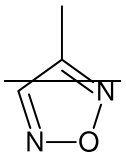
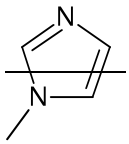
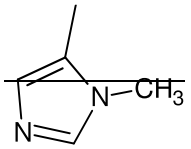
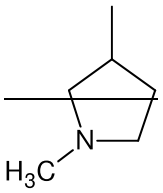
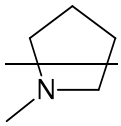
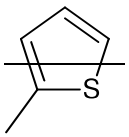
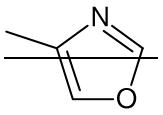
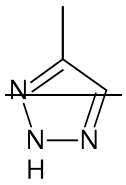
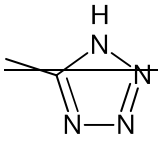
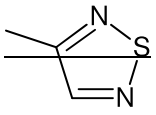
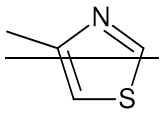
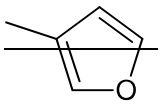
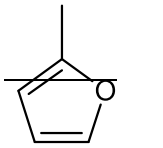
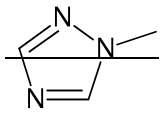
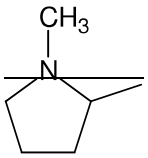
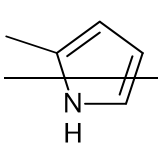
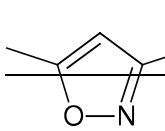


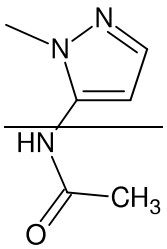
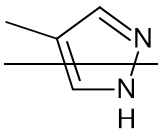
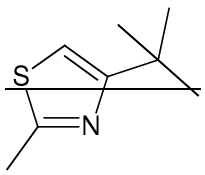
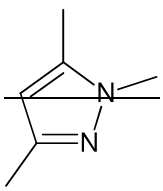


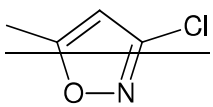
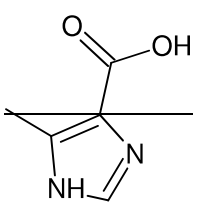
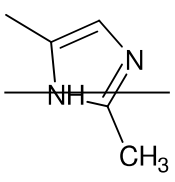













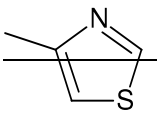
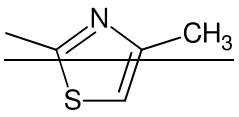
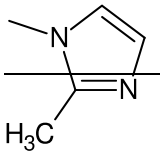
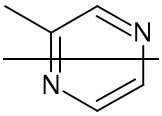
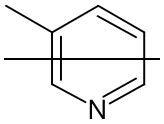
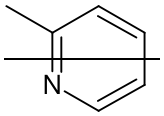
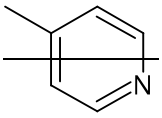
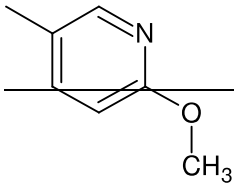
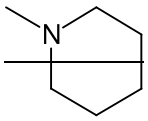
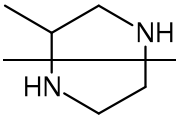
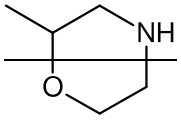
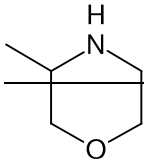
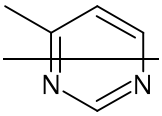
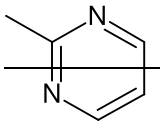
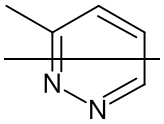
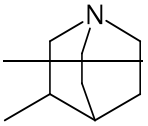
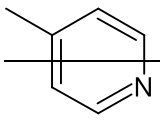
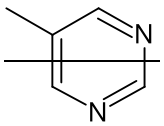
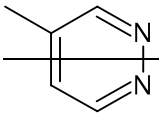
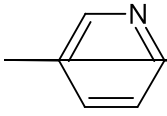
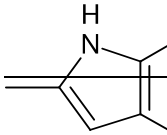
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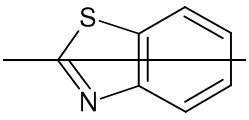
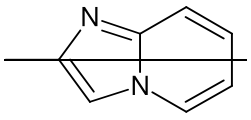
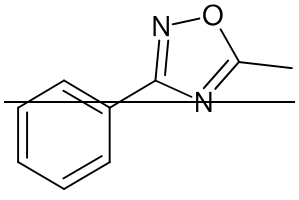
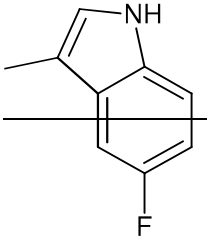
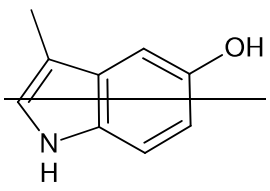
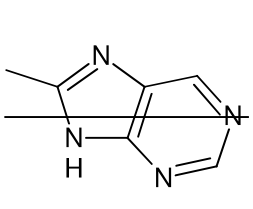
















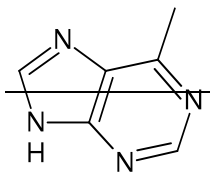
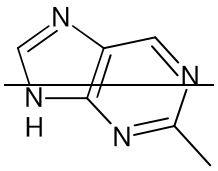
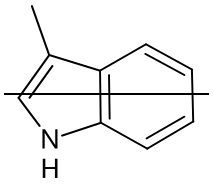
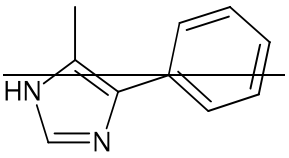
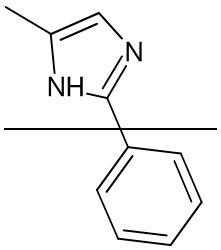
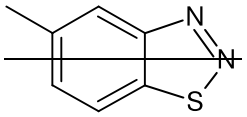
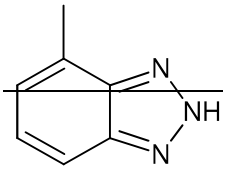
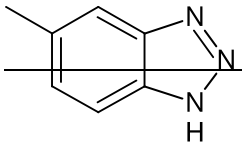
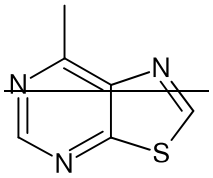
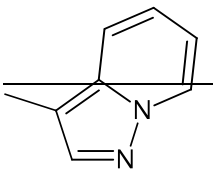
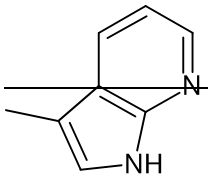
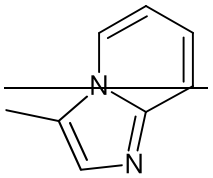
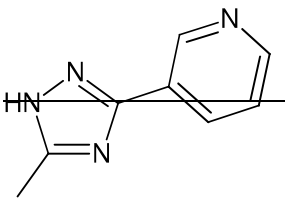
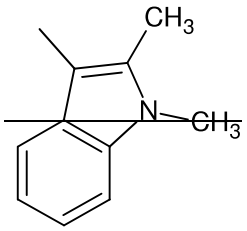
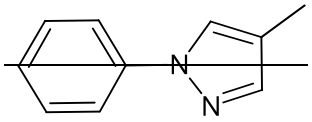
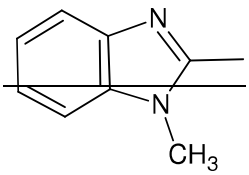
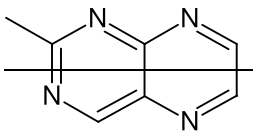
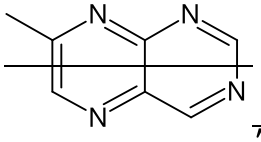
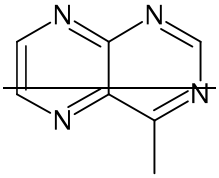




















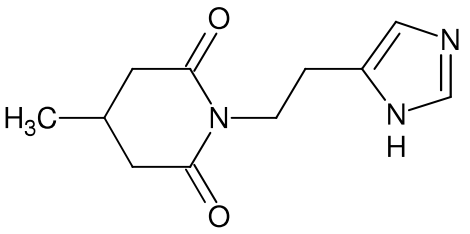






















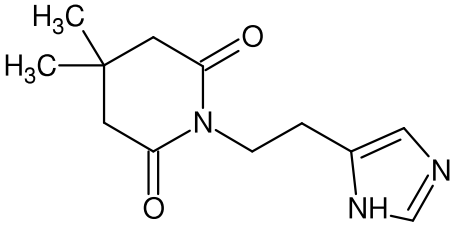







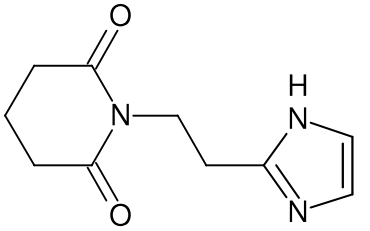


















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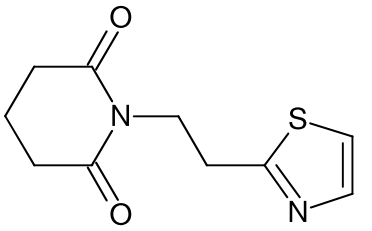
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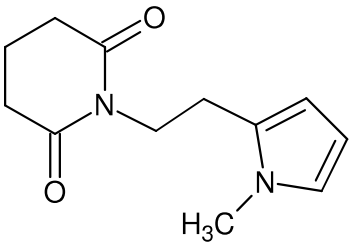
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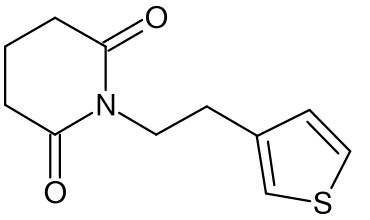


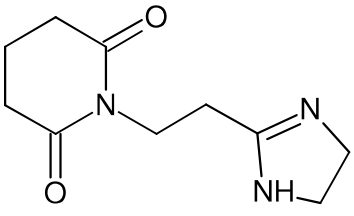


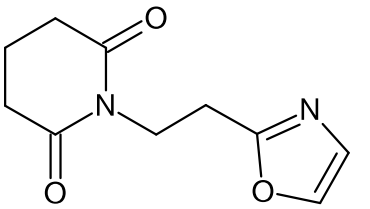


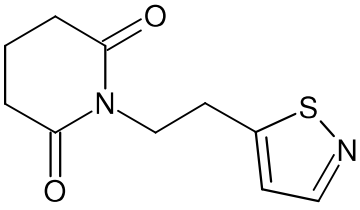


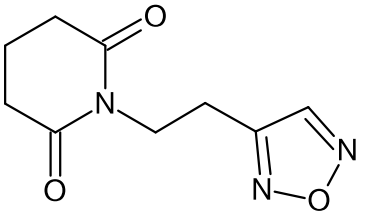


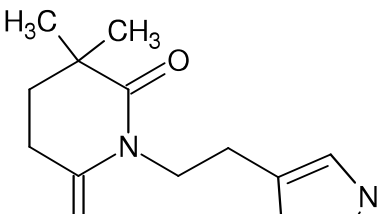


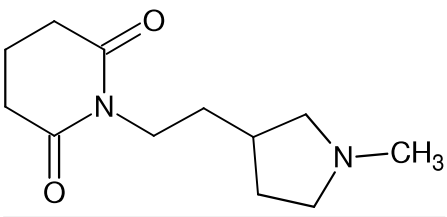


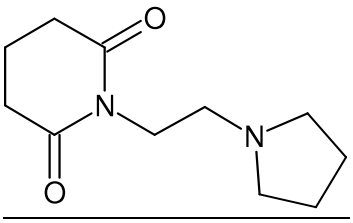


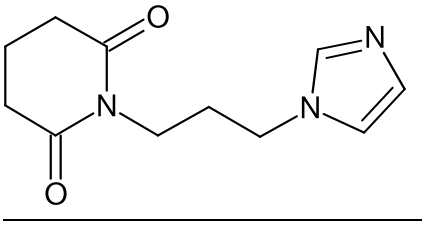


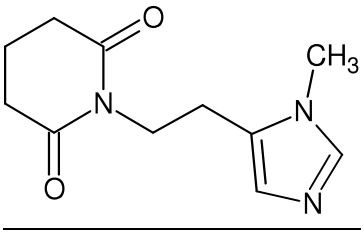


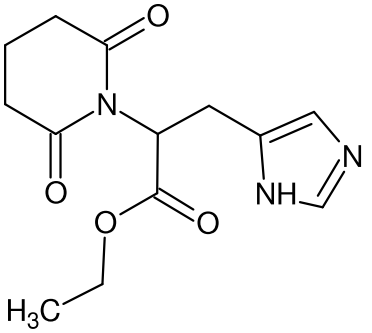


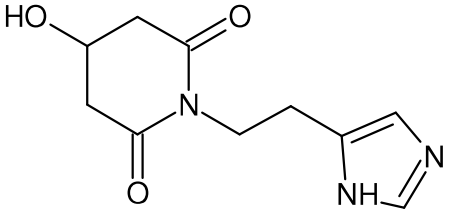


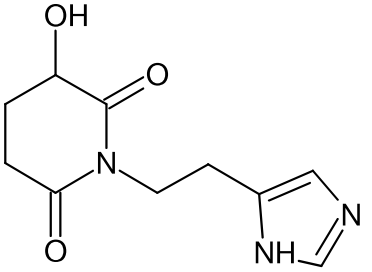


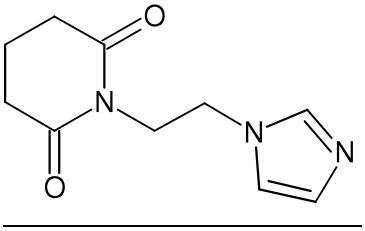


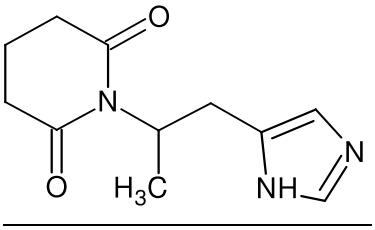


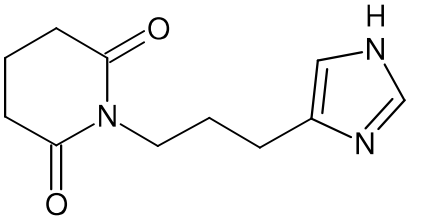


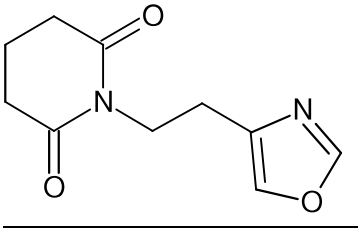


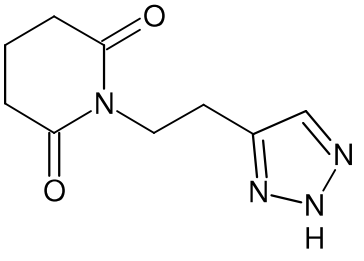


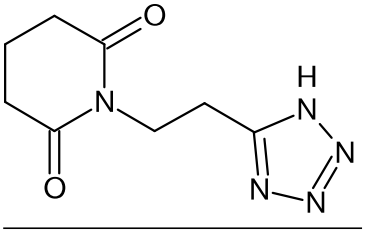


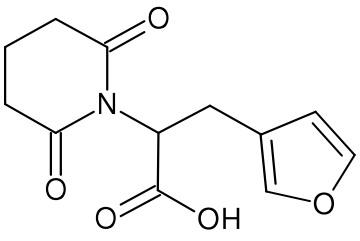


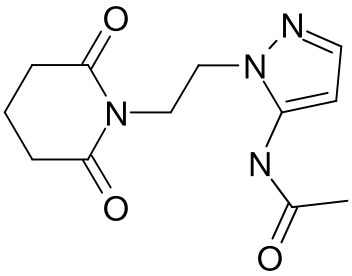


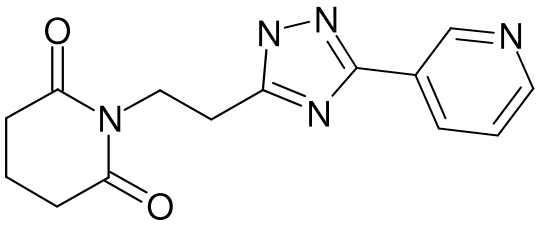


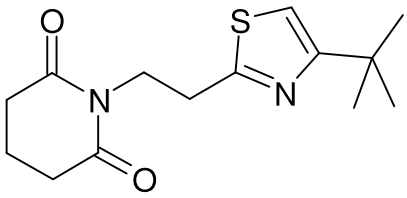


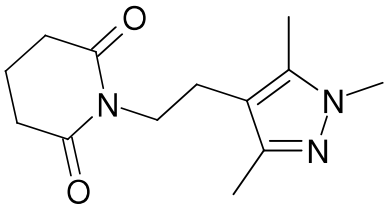


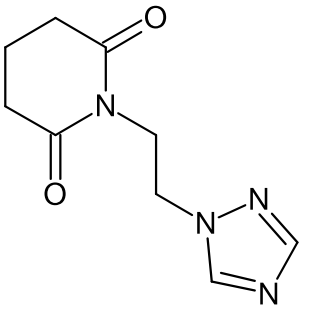


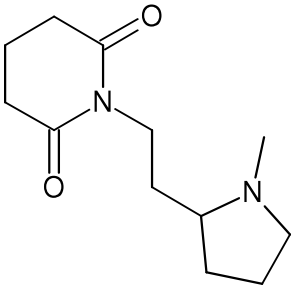


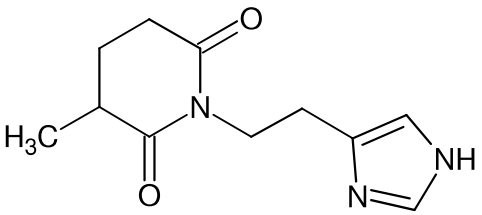


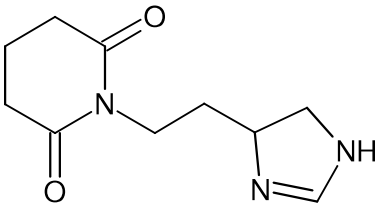


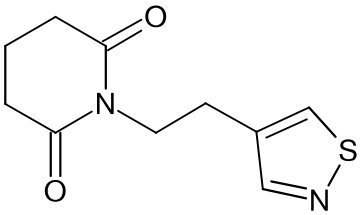


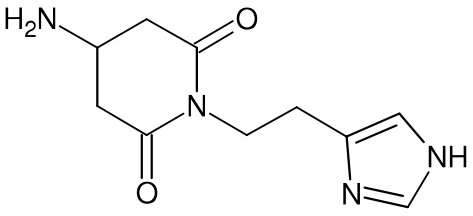


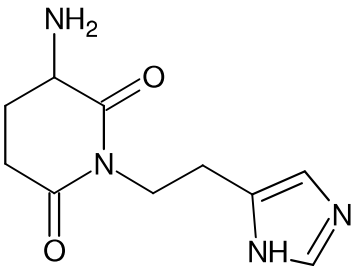


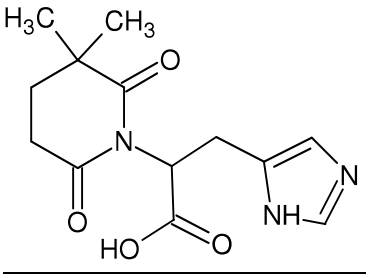


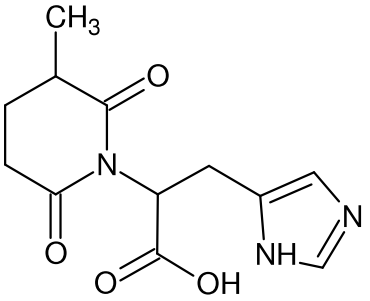


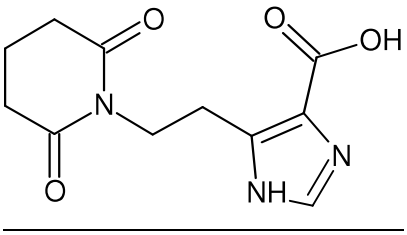


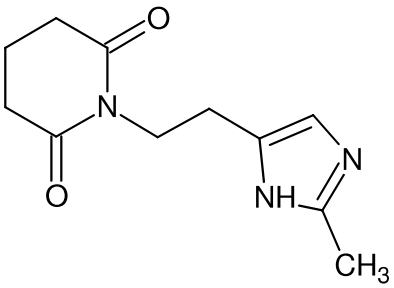


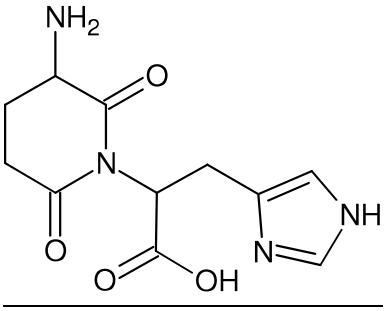


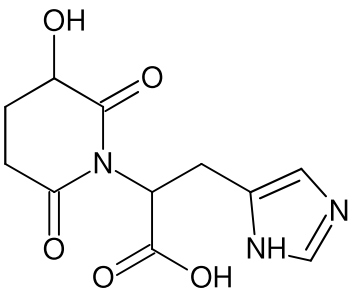


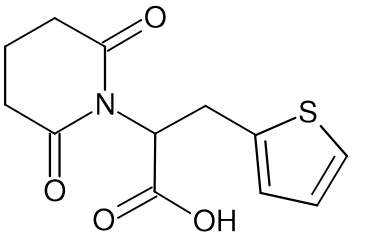


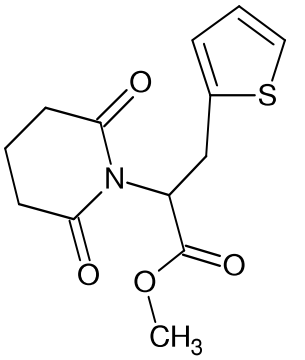


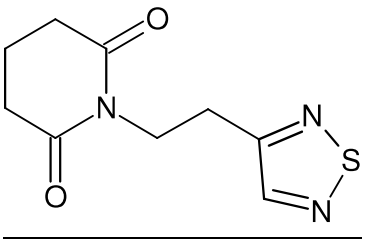


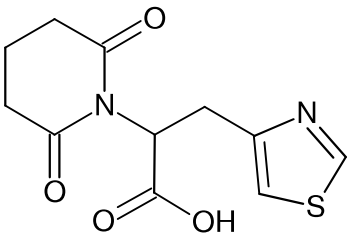


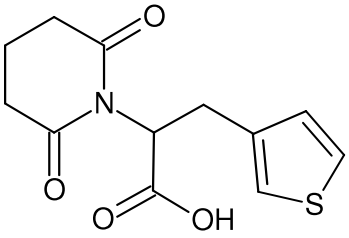


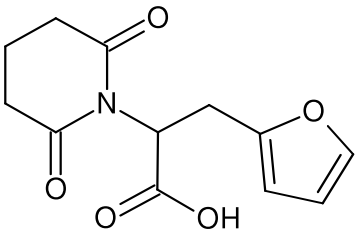


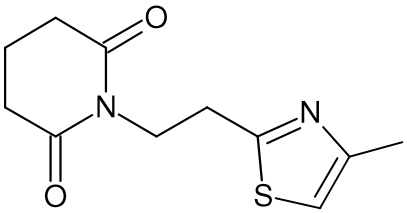


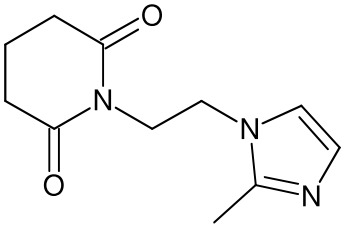


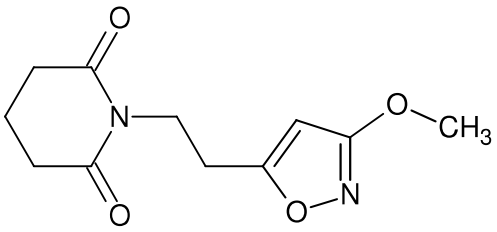


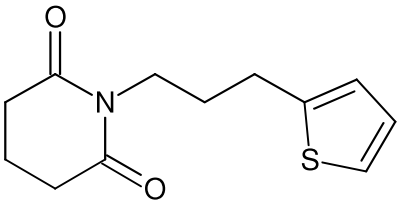


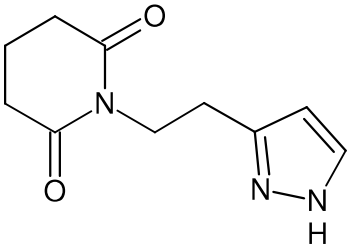


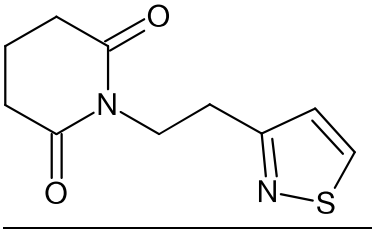


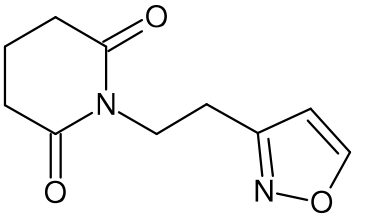


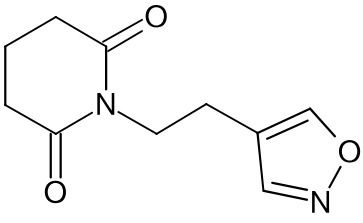


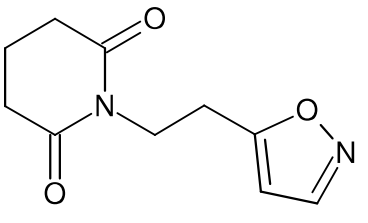


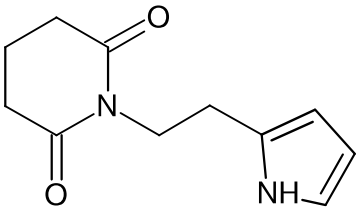


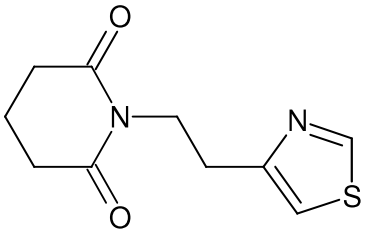


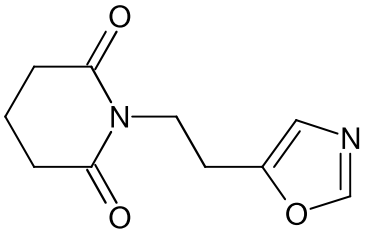


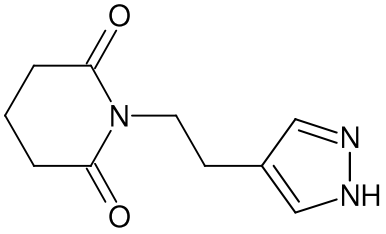


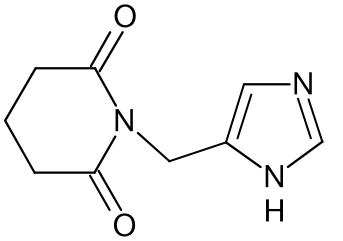


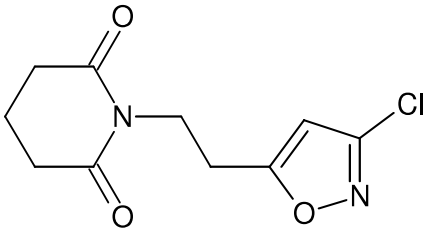


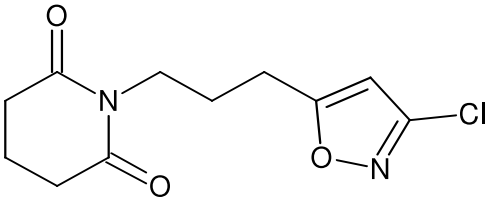


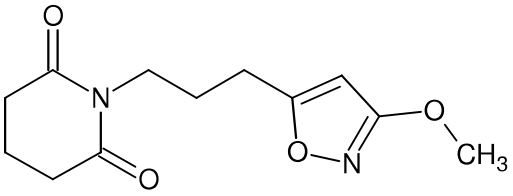


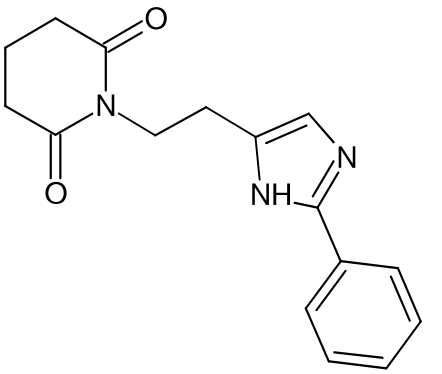


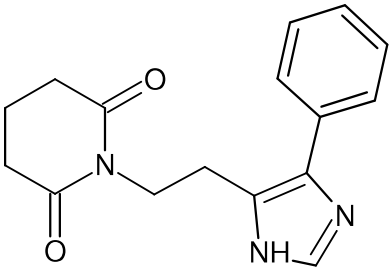


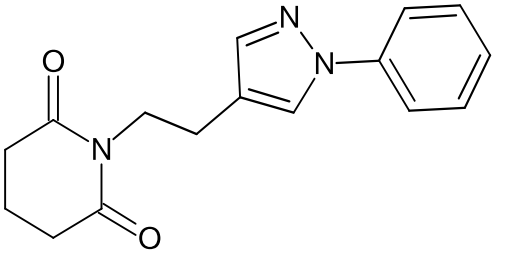


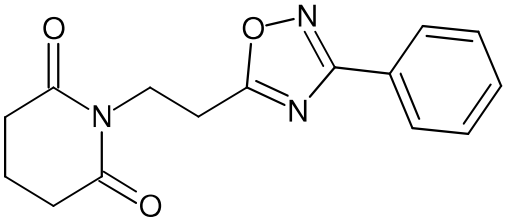


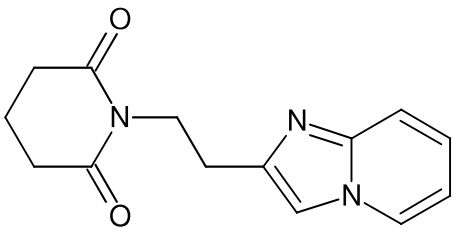


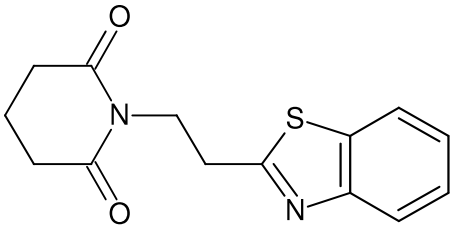


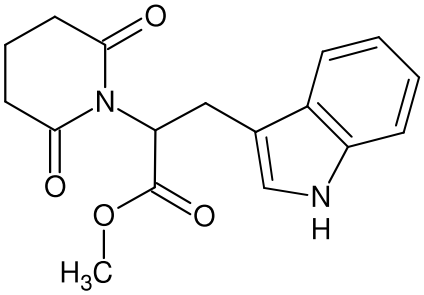


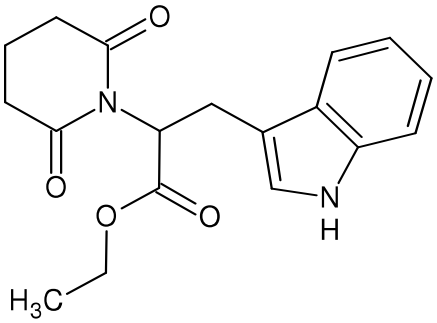


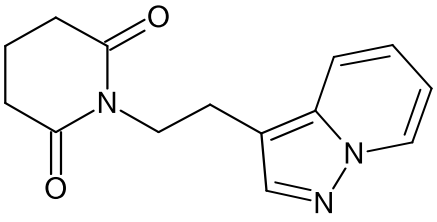


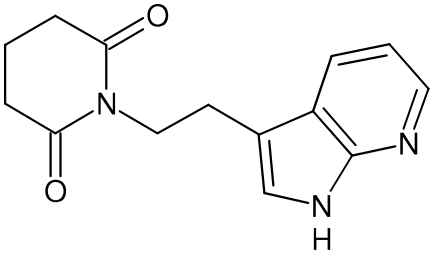


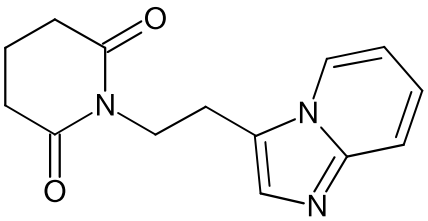


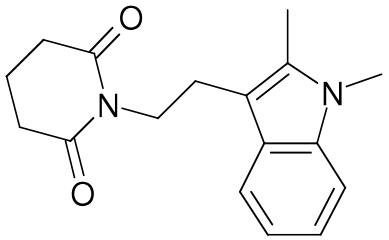


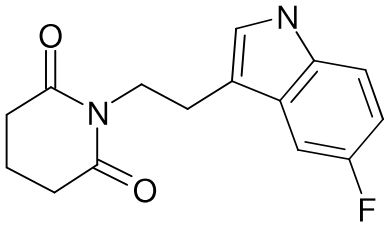


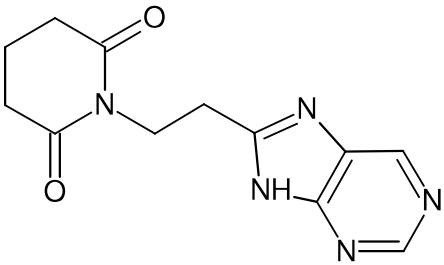


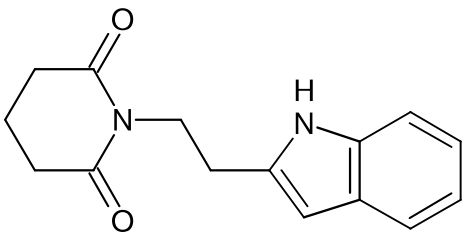


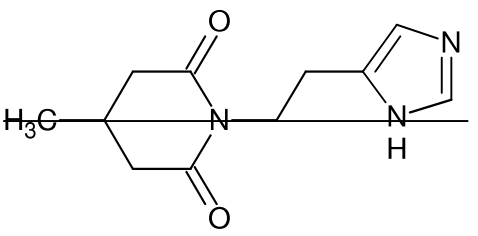


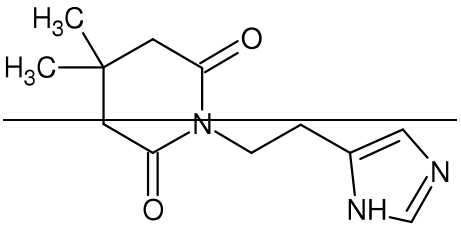


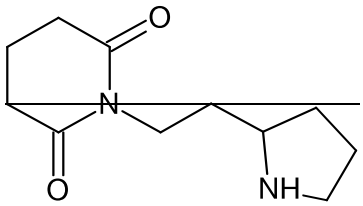


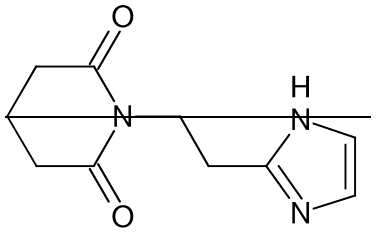


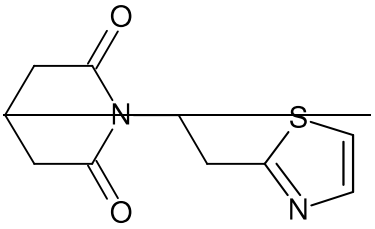


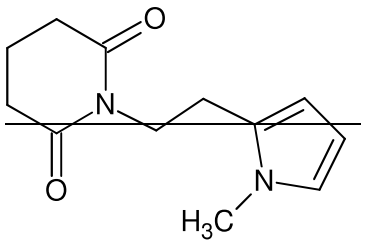


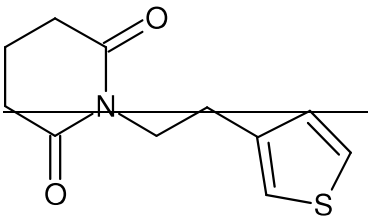


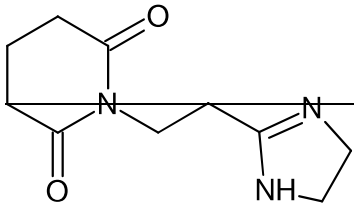


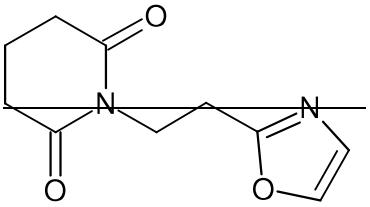


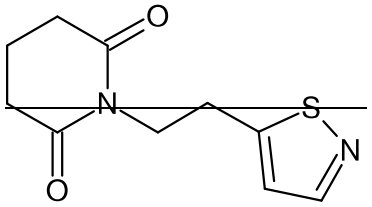


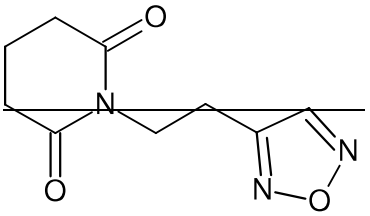


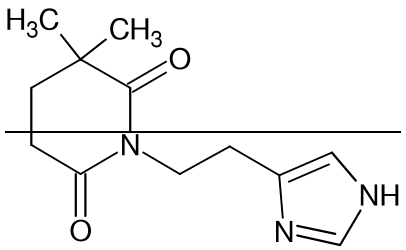


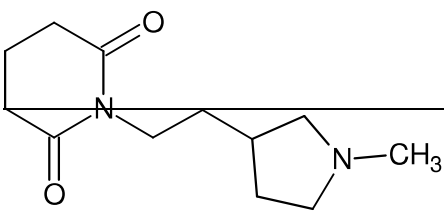


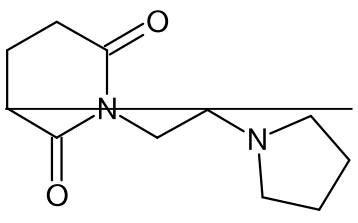


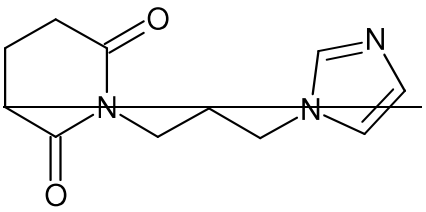


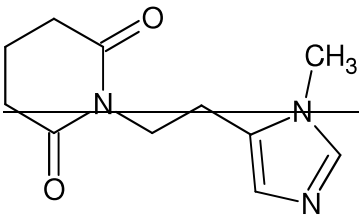


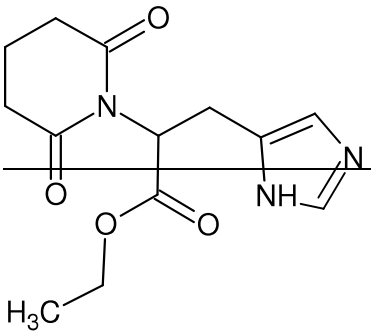


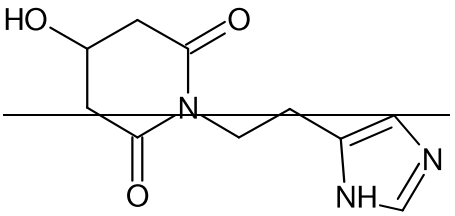


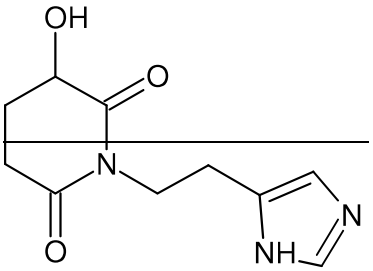


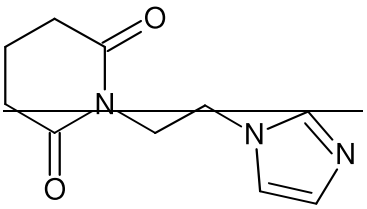


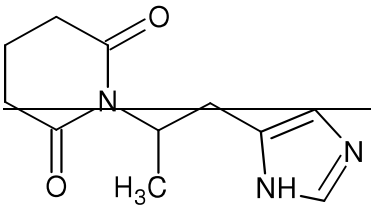


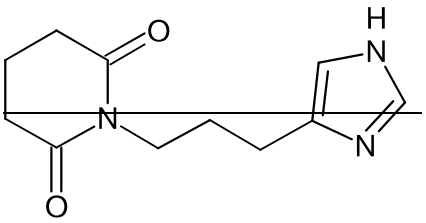


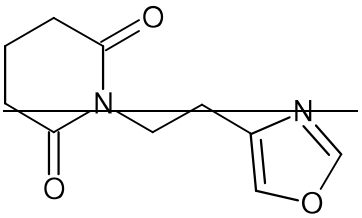


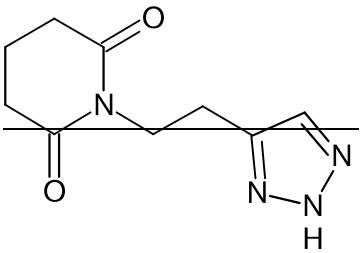


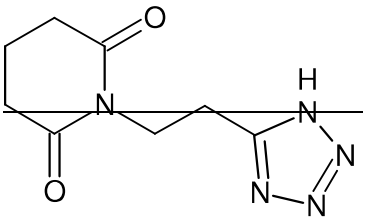


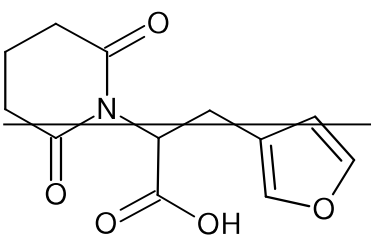


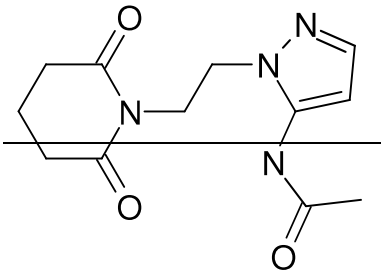


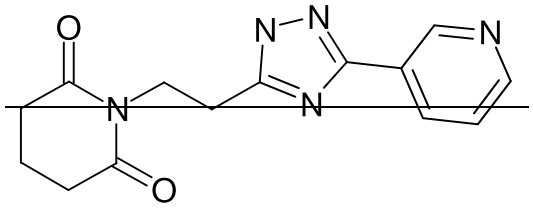


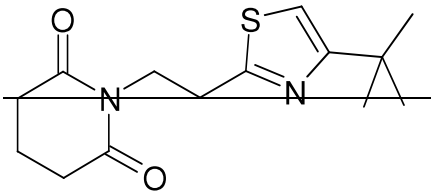


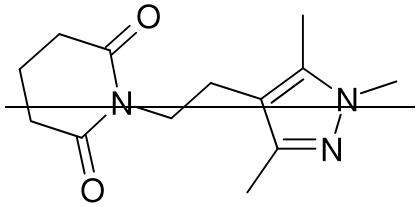


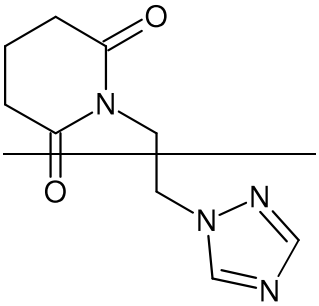


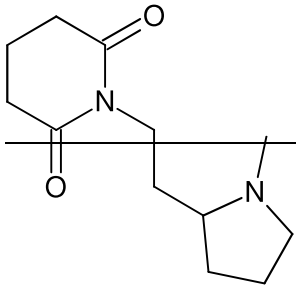


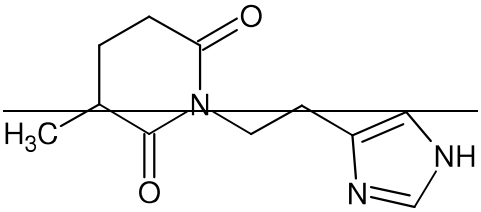


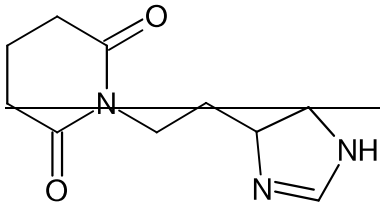


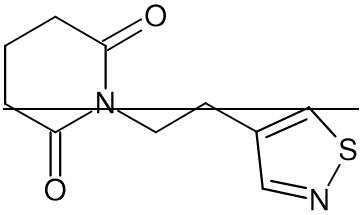


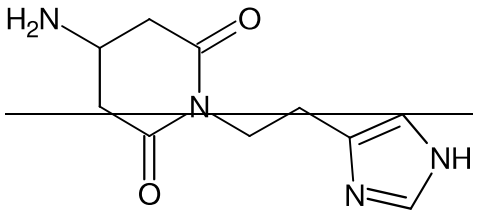


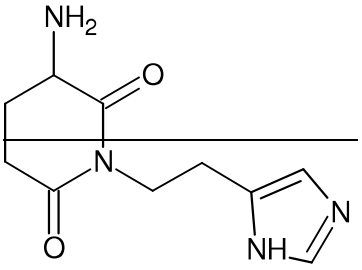


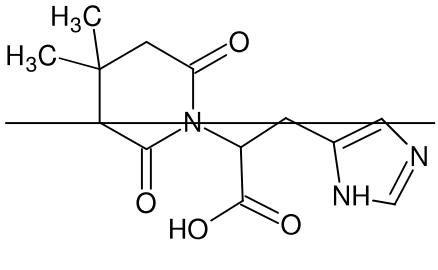


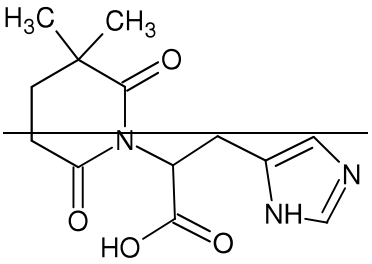


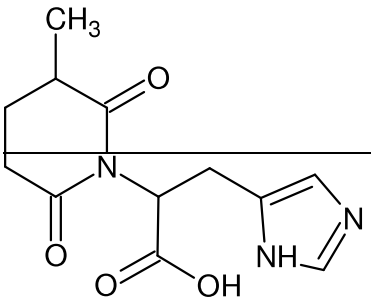


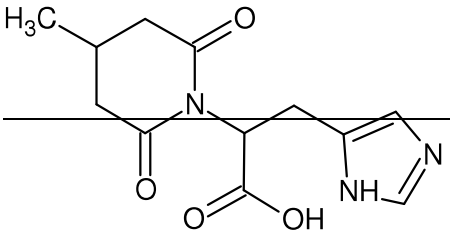


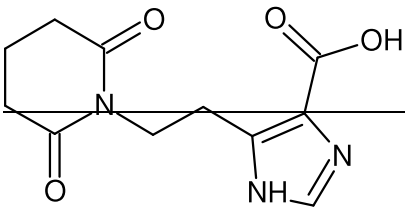


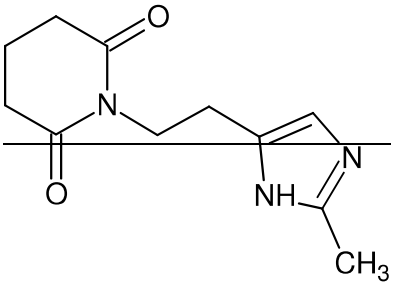


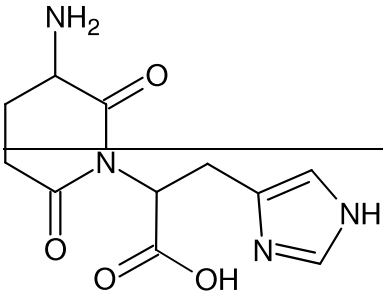


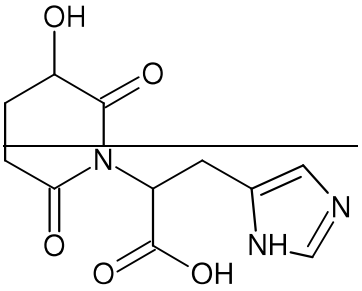


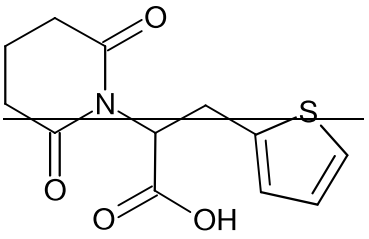


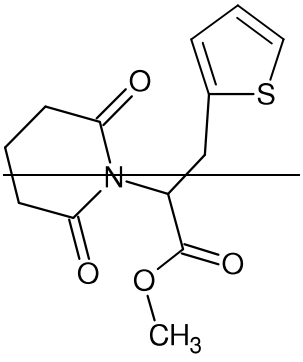


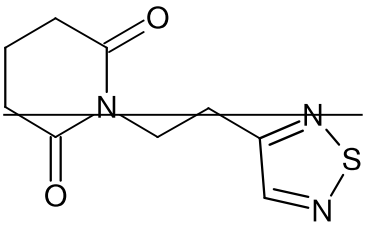


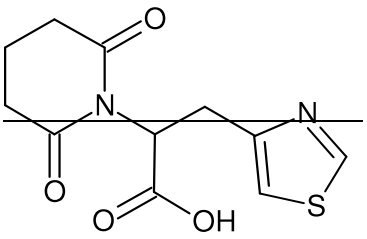
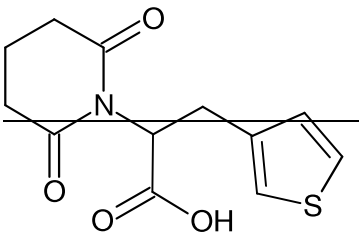
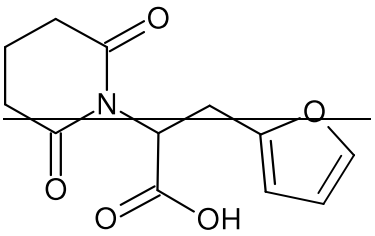
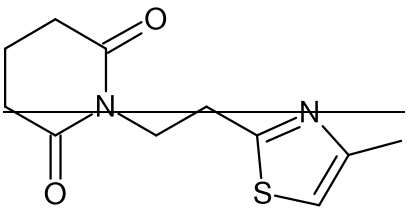
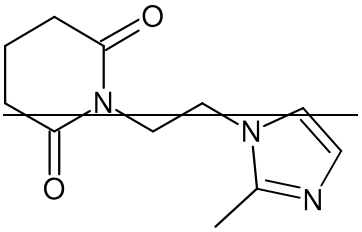
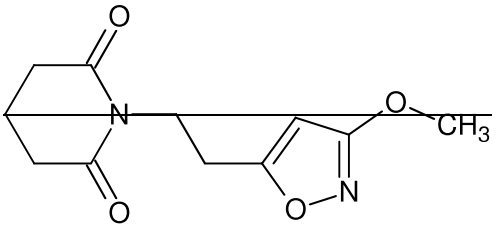
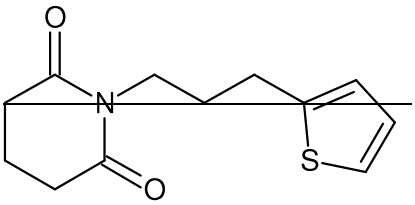
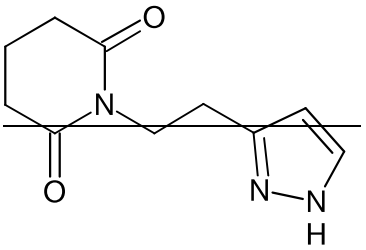
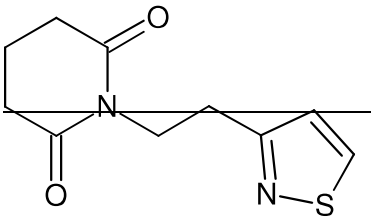
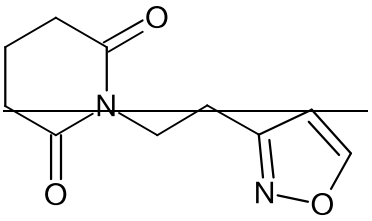
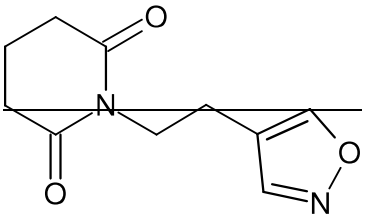
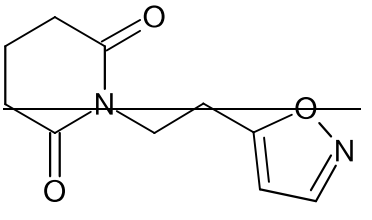
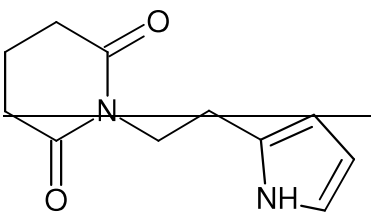
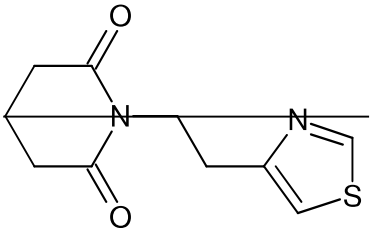


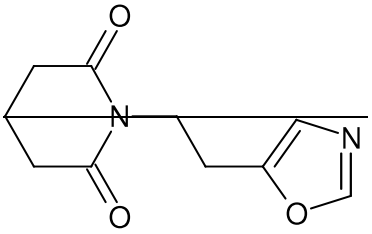
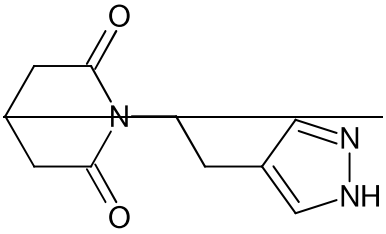
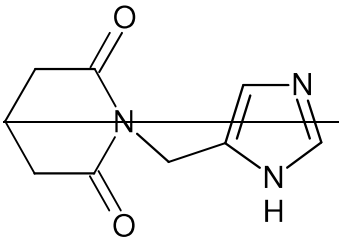
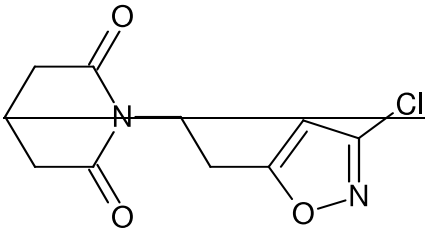
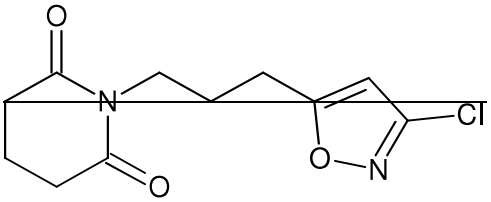
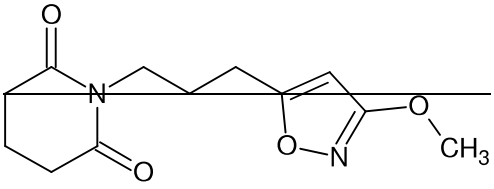
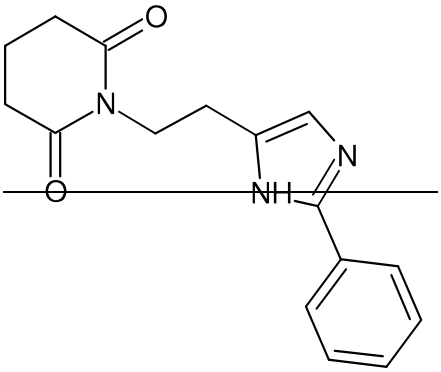
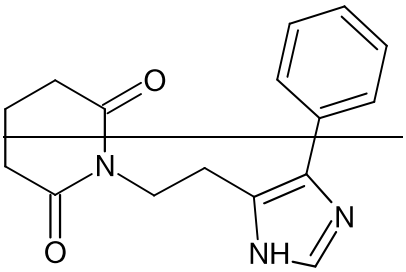
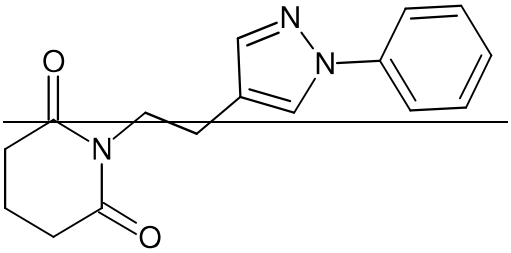
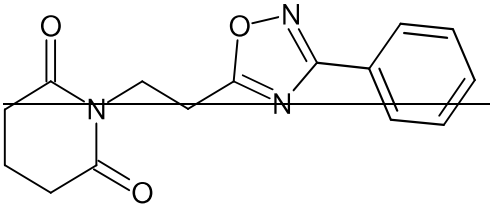
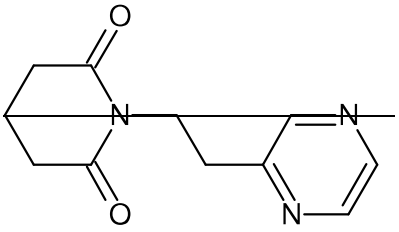
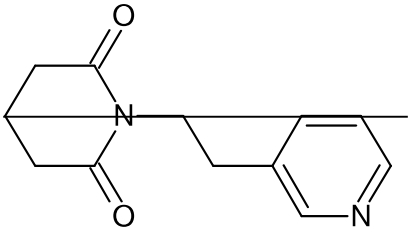


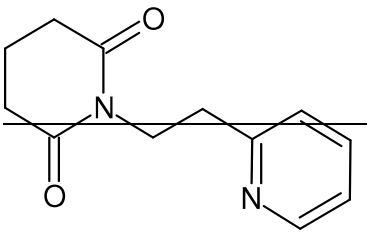


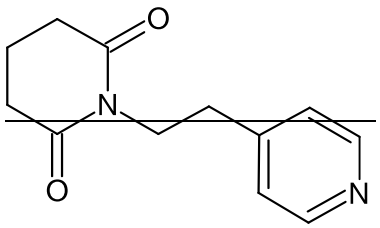


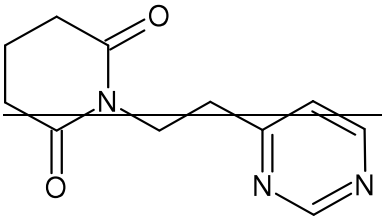


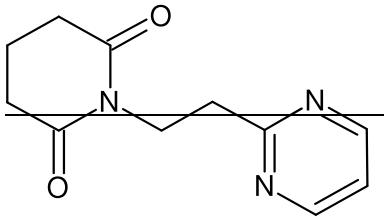















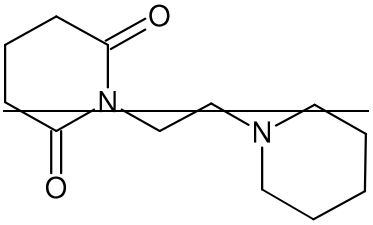













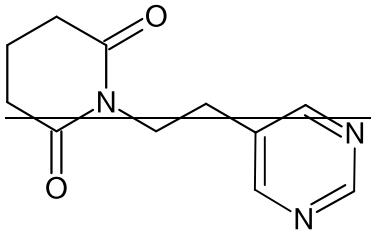


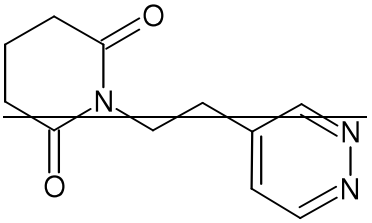


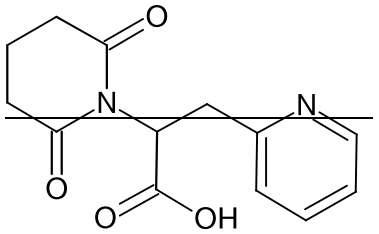


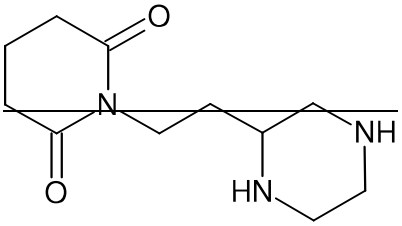


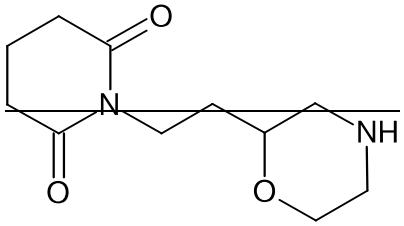


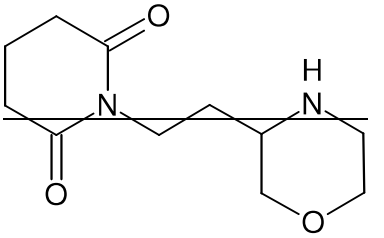


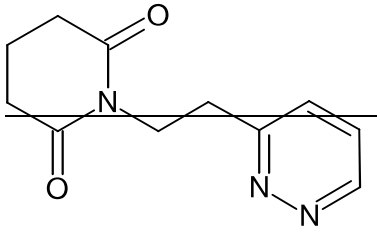


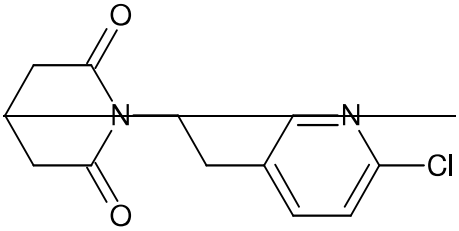


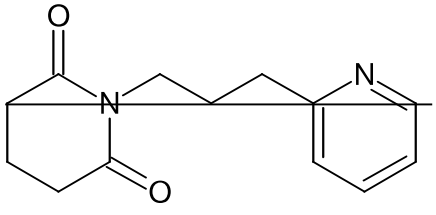


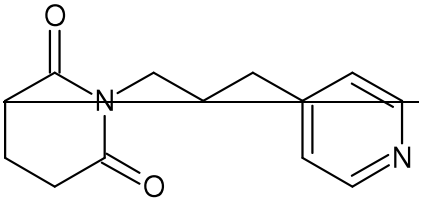


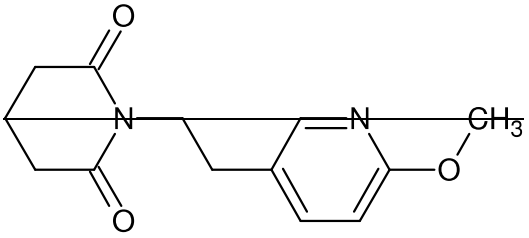


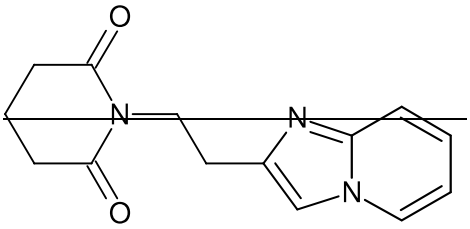


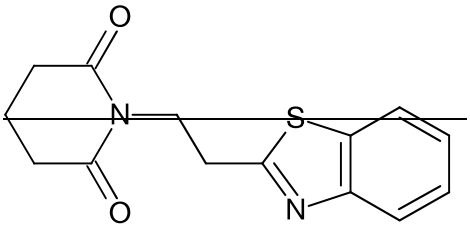


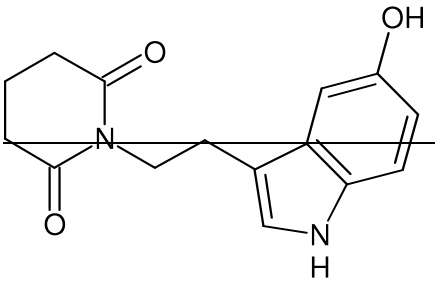


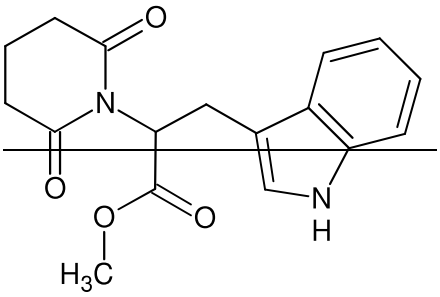


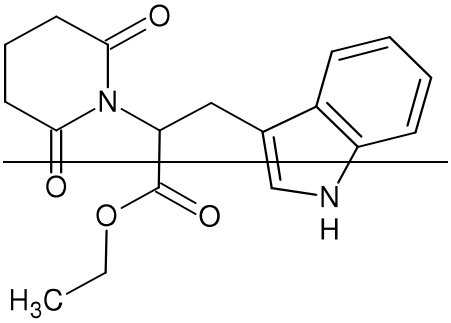


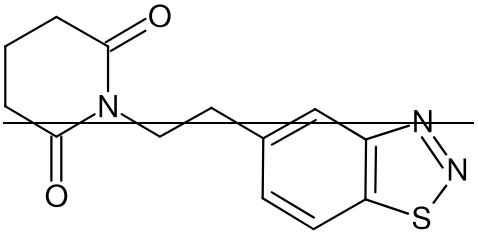


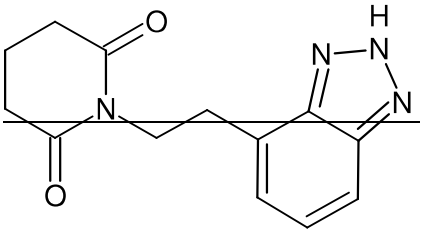


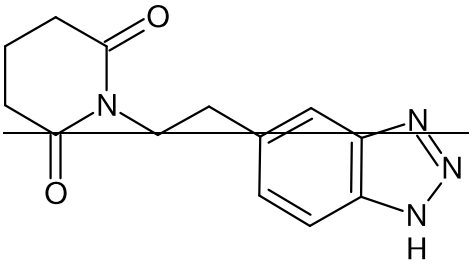


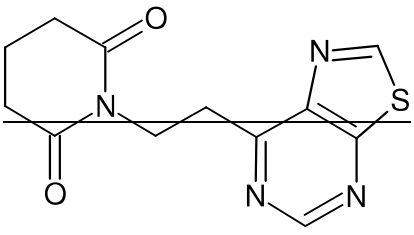


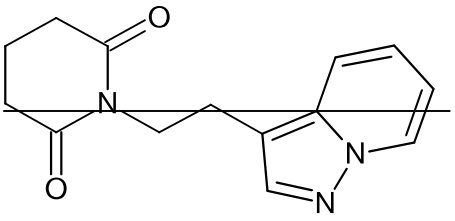


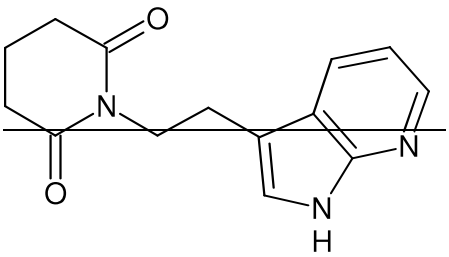


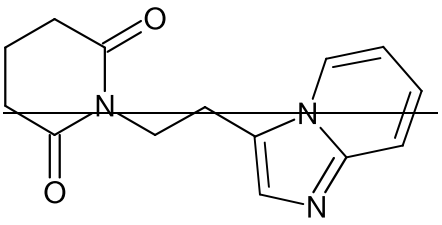


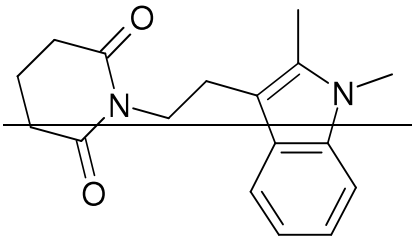


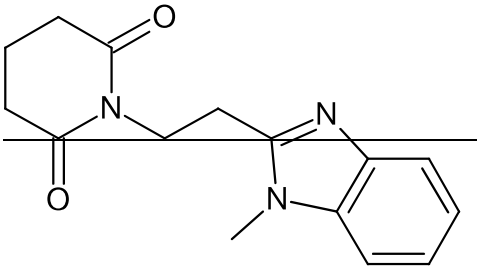


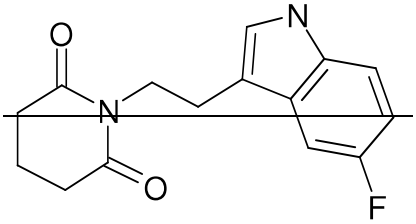


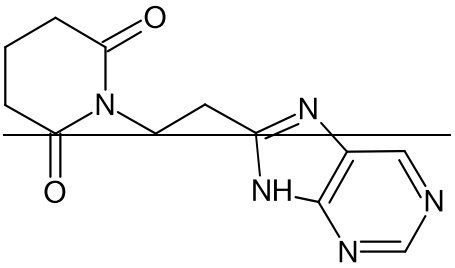


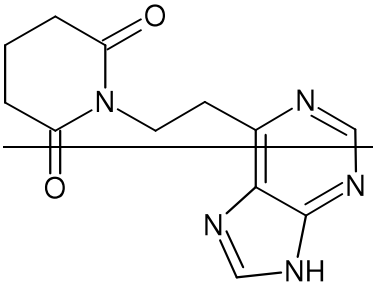


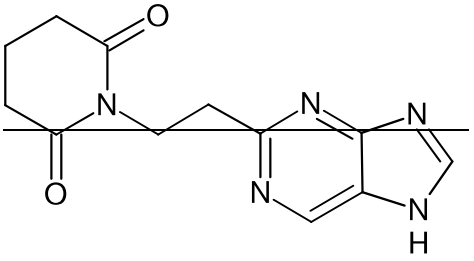


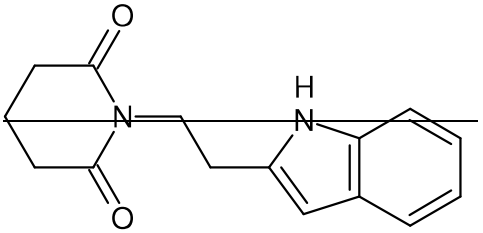


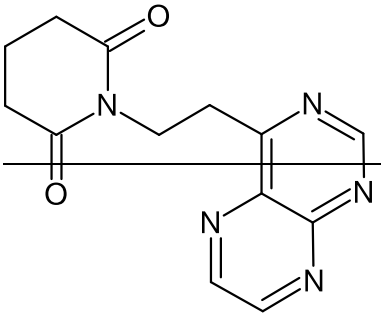


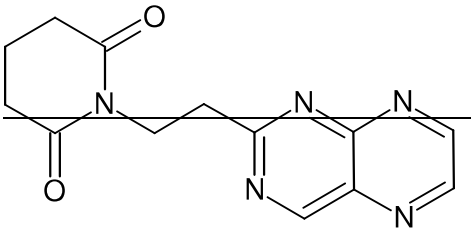


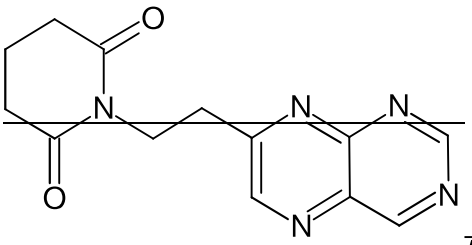




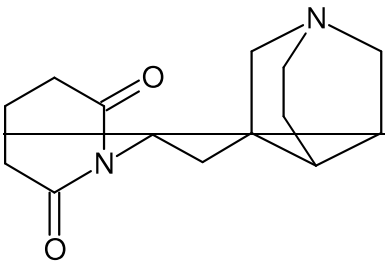








, or



4. A medicament for use in ~~Use of the compound according to any one of the preceding claims or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for~~ the treatment of a respiratory tract disease, wherein the medicament comprises a compound selected from the compounds as defined in any one of claims 1 to 3.

5. The medicament for use ~~according to~~of claim 4, wherein the respiratory tract disease is rhinosinusitis.

6. The medicament for use ~~according to~~of claim 4, wherein the respiratory tract disease is caused by an RNA-comprising virus.

7 The medicament for use ~~according to~~of claim 6, wherein the virus is selected from the group consisting of rhinovirus, Coxsackie virus, respiratory syncytial virus, and influenza virus.

8. The medicament for use ~~according to~~of claim 4, wherein the disease is exacerbations of asthma, chronic obstructive pulmonary disease, bronchitis and mucoviscidosis, which are caused by rhinovirus, influenza virus and/or respiratory syncytial virus.

9. A pharmaceutical composition for use in the treatment of a respiratory tract disease, comprising an effective amount of a compound ~~as claimed~~ selected from the compounds as defined in any one of claims 1 to 3 ~~or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier~~.

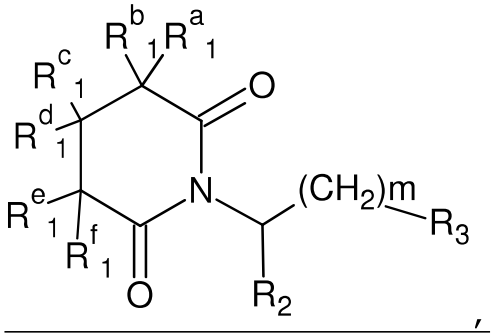
10. The pharmaceutical composition for use of claim 9, wherein the respiratory tract disease is rhinosinusitis.

11. The pharmaceutical composition for use of claim 9, wherein the respiratory tract disease is caused by an RNA-comprising virus.

12. The pharmaceutical composition for use of claim 11, wherein the virus is selected from the group consisting of rhinovirus, Coxsackie virus, respiratory syncytial virus, and influenza virus.

13. The pharmaceutical composition for use of claim 9, wherein the disease is exacerbations of asthma, chronic obstructive pulmonary disease, bronchitis and mucoviscidosis, which are caused by rhinovirus, influenza virus and/or respiratory syncytial virus.

14. Use of a compound of general formula I



,

wherein m is an integer from 0 to 2;

R^{a}_{1}, R^{b}_{1}, R^{c}_{1}, R^{d}_{1}, R^{e}_{1}, and R^{f}_{1}, each independently represents hydrogen, methyl; $-NH_2$, or hydroxyl;

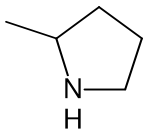
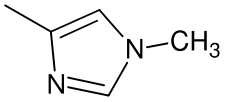
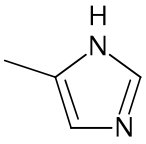
R_2 is hydrogen, methyl, $-C(O)OH$, $-C(O)OC_1$-C_2alkyl;

R_3 is:

1) a 5-membered saturated or unsaturated heterocyclic group comprising from 1 to 4 heteroatoms selected from N, O and S, optionally substituted with 1 to 3 substituents selected from Cl, C_1-C_4alkyl, methoxy, $-C(O)OH$, $-NHC(O)CH_3$, phenyl, or pyridinyl; or

3) a 5-membered unsaturated heterocyclic group comprising from 1 or 2 heteroatoms selected from N and S, condensed with a 6-membered unsaturated nitrogen-containing heterocyclic group; or

3') a group selected from the group consisting of benzothiazol-2-yl, indol-2-yl, and indol-3-yl, optionally substituted with 1 or 2 substituents selected from hydroxyl, F, or methyl,

with the proviso that R_3 is not , , or 

or a pharmaceutically acceptable salt thereof for the manufacture of a medicament for the treatment of a respiratory tract disease.

15. Use of a compound selected from the compounds as defined in any one of claims 1 to 3 in the manufacture of a medicament for the treatment of a respiratory tract disease.

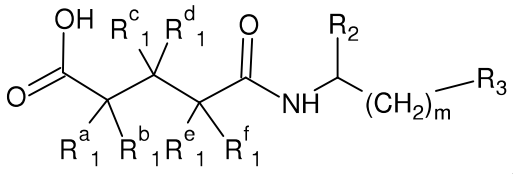
16. The use of claim 14 or 15, wherein the respiratory tract disease is rhinosinusitis.

17. The use of claim 14 or 15, wherein the respiratory tract disease is caused by an RNA-comprising virus.

18. The use of claim 17, wherein the virus is selected from the group consisting of rhinovirus, Coxsackie virus, respiratory syncytial virus, and influenza virus.

19. The use of claim 14 or 15, wherein the disease is exacerbations of asthma, chronic obstructive pulmonary disease, bronchitis and mucoviscidosis, which are caused by rhinovirus, influenza virus and/or respiratory syncytial virus.

~~14~~20. A method for preparing a compound of general formula I according to claim 1 or a pharmaceutically acceptable salt thereof, comprising heating of dicarboxylic acid monoamide of general formula II



,

wherein

m represents an integer of 0 to 2;

R^a_1, R^b_1, R^c_1, R^d_1, R^e_1, and R^f_1, each independently represents hydrogen, ~~C_1-C_6alkyl~~methyl; $-NH_2$, ~~$-NHC_1$-C_6alkyl,~~or hydroxyl~~, or C_1-C_6alkoxy~~;

R_2 is hydrogen, ~~C_1-C_6alkyl~~methyl, $-C(O)OH$, $-C(O)OC_1$-~~C_6alkyl~~C_2alkyl;

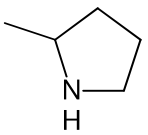
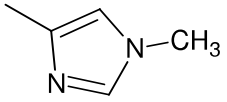
R_3 is:

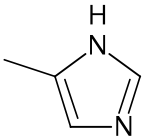
1) a 5-membered saturated or unsaturated heterocyclic group comprising from 1 to 4 heteroatoms selected from N, O and S, optionally substituted with 1 to 3 substituents selected from ~~halogen~~Cl, C_1-~~C_6alkyl~~C_4alkyl, methoxy~~C_1-C_6alkoxy~~, -C(O)OH, ~~-C(O)OC_1-C_6alkyl,~~ -NHC(O)CH_3~~C_1-C_6alkyl~~, phenyl, or pyridinyl;

~~2) a 6-membered saturated or unsaturated heterocyclic group comprising from 1 to 2 heteroatoms selected from N and O, optionally substituted with a group selected from halogen and C_1-C_6alkyl;~~

3) a 5-membered unsaturated heterocyclic group comprising from 1 ~~to 3~~or 2 heteroatoms selected from N and S, ~~optionally substituted with 1 or 2 substituents selected from C_1-C_6alkyl,~~ condensed with a 6-membered unsaturated nitrogen-containing ~~cyclic or~~ heterocyclic group ~~optionally substituted with 1 or 2 substituents selected from hydroxyl, halogen or C_1-C_6alkyl~~; or

3') a group selected from the group consisting of benzothiazol-2-yl, indol-2-yl, and indol-3-yl, optionally substituted with 1 or 2 substituents selected from hydroxyl, F, or methyl,

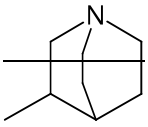
with the proviso that R_3 is not  , 

or  ;

with a dehydrating agent in an organic solvent.

~~4) a 6-membered unsaturated cyclic or heterocyclic group comprising from 1 to 2 nitrogen atoms, condensed with a 5- or 6-membered unsaturated heterocyclic group comprising from 1 to 3 heteroatoms selected from N and S; or~~

~~5) a group of the formula:~~



~~with a dehydrating agent in an organic solvent.~~

~~15~~21. The method of claim ~~14~~20, wherein the dehydrating agent is glutaric anhydride, and the method is performed under heating in an organic solvent~~, preferably in dimethylformamide~~.

~~16~~22. The method of claim ~~14~~20, wherein the dehydrating agent is propionic anhydride, and the method is performed under heating in an organic solvent~~, preferably in toluene~~.

~~17~~23. The method of claim ~~16~~22, wherein the method is performed with addition of sodium acetate.

~~18~~24. The method of claim ~~14~~20, wherein the dehydrating agent is acetic anhydride, and the method is performed under heating in an organic solvent~~, preferably in dioxane~~.

~~19~~25. The method of claim ~~18~~24, wherein the method is performed with addition of sodium acetate.

~~20~~26. The method of claim ~~14~~20, wherein the dehydrating agent is acetic acid ~~chloroanhydride~~chloride, and the method is performed under heating in an organic solvent~~, preferably in acetic acid~~.

~~21~~27. The method of claim ~~14~~20, wherein the dehydrating agent and the solvent are acetic acid anhydride, and the method is performed at 90-100°C.

~~22~~28. The method of claim ~~14~~20, wherein the dehydrating agent is carbonyldiimidazole.