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(54) **PIPERDINE DERIVATIVES AND  
 HYPOTENSIVES CONTAINING THE SAME**

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## Related U.S. Patent Documents

Reissue of:

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(63) Continuation of application No. 08/072,458, filed on Jun. 7, 1993, now abandoned, which is a continuation of application No. 07/655,775, filed on Feb. 15, 1991, now Pat. No. 5,250,681, which is a continuation of application No. 07/443,438, filed on Nov. 30, 1989, now abandoned, which is a continuation of application No. 07/354,880, filed on May 22, 1989, now Pat. No. 5,231,105, which is a continuation of application No. 07/201,911, filed on Jun. 2, 1988, now abandoned.

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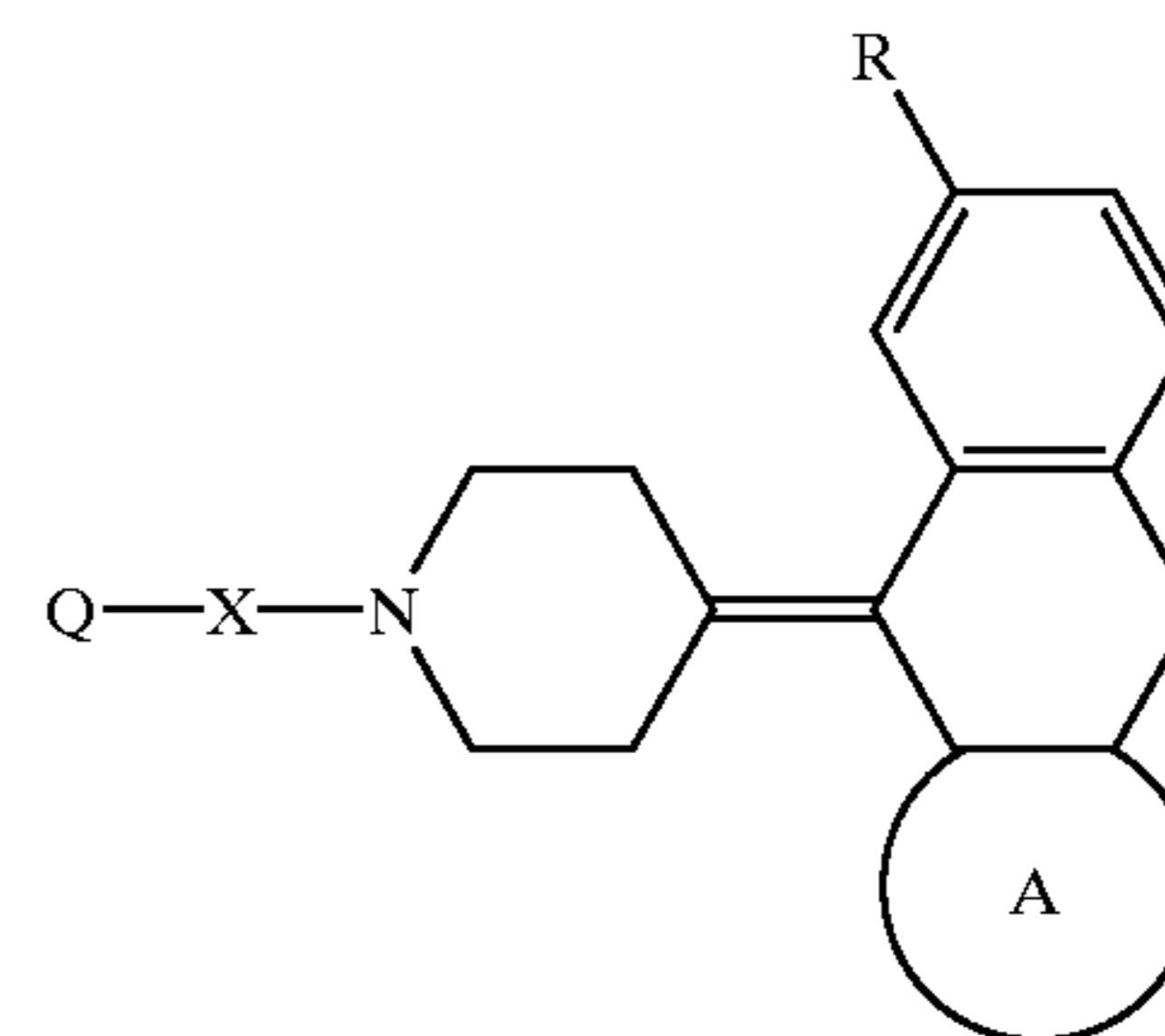
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## (57) ABSTRACT

A piperidine compound of the formula (I):



wherein A is a fused aromatic ring; R is hydrogen, chloro or methoxy; X is  $(\text{CH}_2)_n$ , which may be substituted, in which n is 0 or an integer of 1 to 10,  $-\text{CH}\equiv\text{CH}-$ ,  $-\text{C}\equiv\text{C}-$ ,  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{NH}-$ ,  $-\text{N}(\text{COCH}_3)-$ ,  $-\text{N}(\text{COOC}_2\text{H}_5)-$ ,  $-\text{N}(\text{CHO})-$ ,  $-\text{N}(\text{CH}_3)-$ ,  $-\text{CO}-$ ,  $-\text{SO}-$ , or  $-\text{SO}_2-$ ; Y is  $-\text{CH}\equiv\text{CH}-$ ,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CO}-$ ,  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{NH}-$ ,  $-\text{OCH}_2-$ ,  $-\text{SCH}_2-$ ,  $-\text{NHCH}_2-$ ,  $-\text{CH}(\text{OH})\text{CH}_2-$  or  $-\text{CH}(\text{OH})\text{CH}(\text{OH})-$ ; and Q is substituted or unsubstituted n-hexyl, carboxypropyl, ethoxycarbonylpropyl, cyanopropyl, cyclohexyl, phenyl, indanyl, naphthyl, tetrahydronaphthyl, benzocycloheptyl, piperidinyl, tetrahydroisoquinolinyl, indolyl, pyrrolyl, furyl, thienyl, thiazolyl, oxazolyl or N-methylpyrrolyl, wherein any one or more of the  $-(\text{CH}_2)-$  groups of the hexyl, carboxypropyl, ethoxycarbonylpropyl and cyanopropyl groups may be replaced by  $-\text{CH}\equiv\text{CH}-$ ,  $-\text{C}\equiv\text{C}-$ ,  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{NH}-$ ,  $-\text{N}(\text{COCH}_3)-$ ,  $-\text{N}(\text{COC}_2\text{H}_5)-$ ,  $-\text{N}(\text{CHO})-$ ,  $-\text{N}(\text{CH}_3)-$ ,  $-\text{CO}-$ ,  $-\text{SO}-$  or  $-\text{SO}_2-$ , and wherein one or more of the  $-(\text{CH}_2)-$  groups in X and Q may be substituted by  $-(\text{CH}_2)_4-$  or  $-(\text{CH}_2)_5-$  thereby forming a ring structure.

**13 Claims, No Drawings**



## PIPERDINE DERIVATIVES AND HYPOTENSIVES CONTAINING THE SAME

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This application is a *reissue application of application Ser. No. 08/269,628, filed Jul. 1, 1994, now U.S. Pat. No. 5,393,890 which in turn is a continuation of application Ser. No. 08/072,458, filed Jun. 7, 1993, now abandoned, which is a continuation of application Ser. No. 07/655,775, filed Feb. 15, 1991, now U.S. Pat. No. 5,250,681, which is a continuation of application Ser. No. 07/443,438, filed Nov. 30, 1989, now abandoned, which is a continuation of application Ser. No. 07/354,880, filed May 22, 1989, now U.S. Pat. No. 5,231,105, which is a continuation of application Ser. No. 07/201,911, filed Jun. 2, 1988, now abandoned.*

### BACKGROUND OF THE INVENTION

#### FIELD OF THE INVENTION

The present invention relates to a piperidine derivative and hypotensives containing the same.

#### DESCRIPTION OF THE BACKGROUND

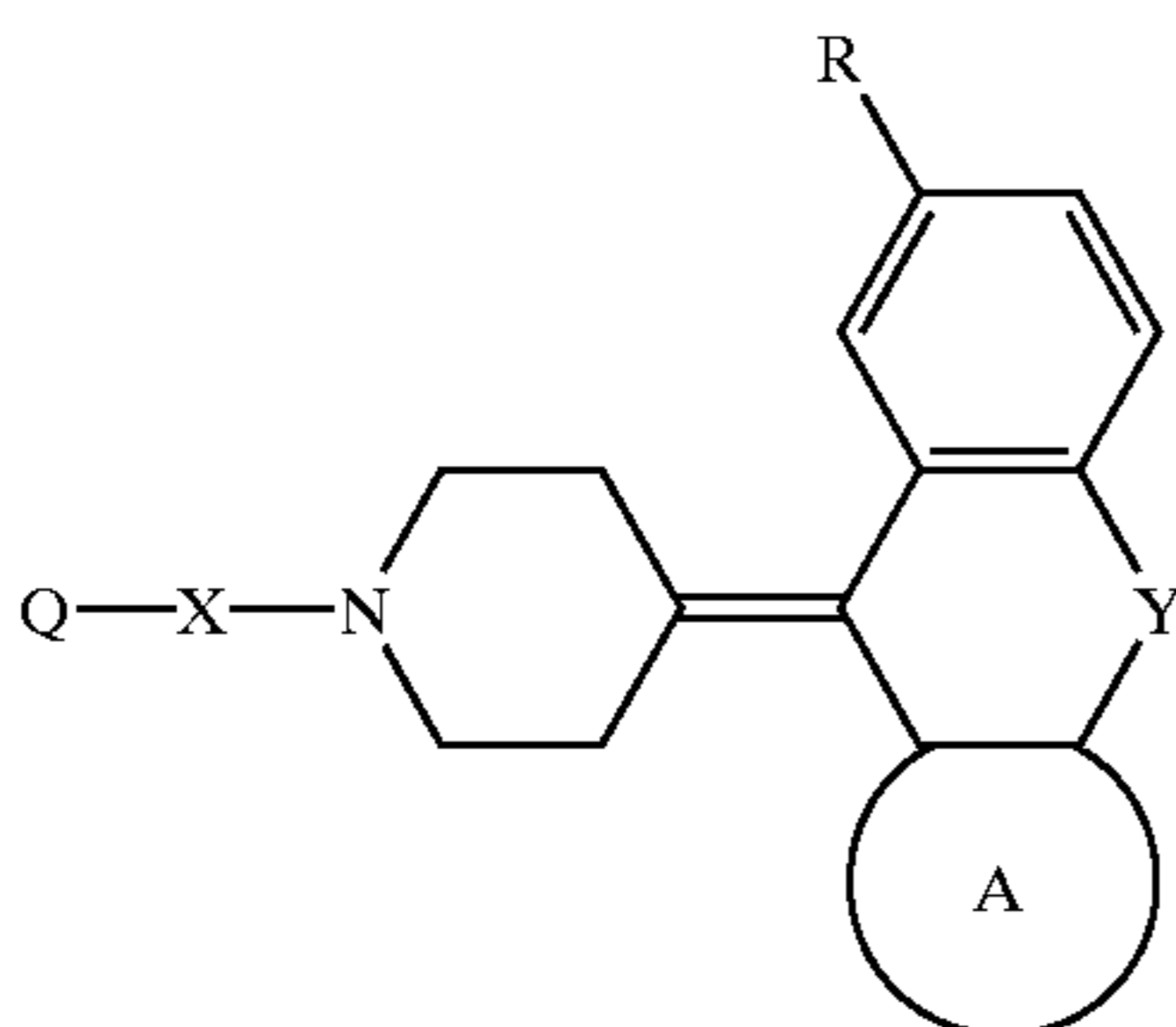
It is said that there are about 13,000,000 patients with hypertension in Japan and its frequency of occurrence in individuals becomes greater with advancing age. Further, as the age of a given population increases, increased attention is directed to hypertension which becomes more and more of a dangerous factor in severe heart and cerebral diseases represented by cardiac infarction and cerebral apoplexy. In recent years, calcium antagonists or angiotensin convertase inhibitors have been widely used as excellent primary selection drugs for treatment of hypertension. But the pharmaceutical effects or safety of these hypotensives have recently come into question.

A need therefore continues to exist for new hypotensive agents which exhibit excellent pharmaceutical effects and safety which can be industrially prepared at low cost and in a simple manner.

#### SUMMARY OF THE INVENTION

Accordingly, one object of the present invention is to provide an effective hypotensive agent which is relatively simple to prepare at low cost.

Briefly, this object and other objects of the present invention as hereinafter will become more readily apparent can be attained by a piperidine derivative of formula (I):



wherein A is a fused aromatic ring; R is hydrogen, chloro or methoxy; X is  $(CH_2)_n$ , which may be substituted, in which

n is 0 or an integer of 1 to 10,  $-CH\equiv CH-$ ,  $-C\equiv C-$ ,  $-O-$ ,  $-S-$ ,  $-NH-$ ,  $-N(COCH_3)-$ ,  $-N(COOC_2H_5)-$ ,  $-N(CHO)-$ ,  $-N(CH_3)-$ ,  $-CO-$ ,  $-SO-$ , or  $-SO_2-$ ; Y is  $-CH\equiv CH-$ ,  $-CH_2CH_2-$ ,  $-CH_2CO-$ ,  $-O-$ ,  $-S-$ ,  $-NH-$ ,  $-OCH_2-$ ,  $-SCH_2-$ ,  $-NHCH_2-$ ,  $-CH(OH)CH_2-$  or  $-CH(OH)CH(OH)-$ ; and Q is substituted or unsubstituted n-hexyl, carboxypropyl, ethoxycarbonylpropyl, cyanopropyl, cyclohexyl, phenyl, indanyl, naphthyl, tetrahydronaphthyl, benzocycloheptyl, piperidinyl, tetrahydroisoquinolinyl, indolyl, pyrrolyl, furyl, thienyl, thiazolyl, oxazolyl or N-methylpyrrolyl, wherein any one or more of the  $-(CH_2)-$  groups of the hexyl, carboxypropyl, ethoxycarbonylpropyl and cyanopropyl groups may be replaced by  $-CH\equiv CH-$ ,  $-C\equiv C-$ ,  $-O-$ ,  $-S-$ ,  $-NH-$ ,  $-N(COCH_3)-$ ,  $-N(COC_2H_5)-$ ,  $-N(CHO)-$ ,  $-N(CH_3)-$ ,  $-CO-$ ,  $-SO-$  or  $-SO_2-$ , and wherein one or more of the  $-(CH_2)-$  groups in X and Q may be substituted by  $-(CH_2)_4-$  or  $-(CH_2)_5-$  thereby forming a ring structure.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

It has now been discovered that piperidine derivatives of the formula (I) above are effective as hypotensive agents. The present piperidine derivative exhibits excellent hypotensive action, its method of synthesis is simple and its derivatives can be easily prepared.

In formula (I), the fused aromatic ring (A) is a fused benzene, thiophene, pyridine or the like ring. Further, in formula (I) above, substituents X and Q may be substituted by at least one substituent selected from the group consisting of  $H(CH_2)_n$ , wherein n is 1 to 10,  $C_1(CH_2)_3$ , allyl, phenyl, isopropyl, hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, ethoxycarboxy, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl)amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl.

The method of administration of the present piperidine derivative when used as a hypotensive, include oral and parenteral routes. Dose is determined depending upon age, body weight and condition of the patient and route of administration. Daily dose is generally 0.01 to 2000 mg/kg for oral administration. In the case of parenteral administration, the daily dose is 0.01 to 1000 mg/kg. The present piperidine derivative may be prepared in the form of ordinary preparations such as for example, tablets, powders, capsules, solutions, sugar-coated tablets or depots, which may be prepared in a conventional manner using conventional preparation aids. For example, tablets can be obtained by mixing the piperidine derivative of the present invention diluents (e.g., lactose, calcium carbonate or calcium phosphate), binders (e.g., gum arabic, corn starch or gelatin), swelling agents (e.g., alginic acid, corn starch or pregelatinated starch), sweeteners (e.g., sucrose or saccharin), flavors (e.g., peppermint, Gaultheria adenothis oil or cherry), lubricating and wetting agents (e.g., magnesium stearate, talc or carboxymethyl cellulose).

Having now generally described this invention, a further understanding can be obtained by reference to certain specific examples which are provided herein for purposes of



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illustration only and are not intended to be limited unless otherwise specified.

Unless otherwise indicated, the developing conditions for silica gel TLC procedures were under chloroform/methanol-9/1. Mass spectra (MS) were performed in the FD mode (m/z) and nuclear magnetic resonance spectra (NMR) were measured using tetramethylsilane as the internal standard and CDCl<sub>3</sub> as the solvent.

## EXAMPLE 1

## 4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-hexylpiperidine hydrochloride

A solution of 273 mg (1 mmol) of 4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-hexylpiperidine, 165 mg (1 mmol) of 1-bromohexane, 745 mg (5 mmols) of sodium iodide and 414 mg (3 mmols) of potassium carbonate in 20 ml of methyl isobutyl ketone was stirred and refluxed at 120° C. overnight on an oil bath. After the reaction, the mixture was washed by adding 20 ml of water thereto. Then the organic phase was separated and the solvent was distilled off under reduced pressure. After purifying by silica gel column chromatography (eluent: methanol/chloroform, 1/100-1/50), the product was converted into the hydrochloride with an equimolar hydrogen chloride/dioxane solution.

Amount yielded 180 mg

Yield 46%

TLC Rf=0.68

MS 357 (M+)

NMR 0.83 (3H, t), 1.2-1.4 (6H, m), 1.7-1.9 (2H, m), 2.31 (2H, dd), 2.53 (2H, d), 2.7-2.8 (2H, m), 3.14 (2H, dd), 3.38 (2H, dd), 3.38 (2H, d), 6.92 (2H, s), 7.2-7.4 (8H, m)

Hereafter procedures were carried out in manner similar to Example 1.

## EXAMPLE 2

## 4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-octylpiperidine hydrochloride

Amount yielded 300 mg

Yield 72%

TLC Rf=0.71

MS 385 (M+)

NMR 0.85 (3H, t), 1.2-1.4 (10H, m), 1.7-2.0 (2H, m), 2.30 (2H, dd), 2.53 (2H, d), 2.7-2.9 (2H, m), 3.13 (2H, dd), 3.38 (2H, d), 6.90 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 3

## 1-Decyl-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride

Amount yielded 300 mg

Yield 67%

TLC Rf=0.75

MS 413 (M+)

NMR 0.85 (3H, t), 1.2-1.4 (14H, m), 1.7-1.9 (2H, m), 2.33 (2H, dd), 2.54 (2H, d), 2.7-2.8 (2H, m), 3.15 (2H, dd), 3.39 (2H, d), 6.92 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 4

## 4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-dodecylpiperidine hydrochloride

Amount yielded 1.10 g

Yield 92%

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TLC Rf=0.78

MS 441 (M+)

NMR 0.85 (3H, t), 1.1-1.5 (18H, m), 1.7-1.9 (2H, m), 2.32 (2H, dd), 2.54 (2H, d), 2.7-2.8 (2H, m), 3.12 (2H, dd), 3.36 (2H, d), 6.93 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 5

## 4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-tetradecylpiperidine hydrochloride

Amount yielded 1.20 g

Yield 95%

TLC Rf=0.78

MS 469 (M+)

NMR 0.82 (3H, t), 1.1-1.5 (22H, m), 1.7-1.9 (2H, m), 2.33 (2H, dd), 2.55 (2H, d), 2.7-2.8 (2H, m), 3.15 (2H, dd), 3.40 (2H, d), 6.92 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 6

## 4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-hexadecylpiperidine hydrochloride

Amount yielded 1.18 g

Yield 88%

TLC Rf=0.80

MS 497 (M+)

NMR 0.80 (3H, t), 1.1-1.6 (26H, m), 1.7-1.9 (2H, m), 2.33 (2H, dd), 2.58 (2H, d), 2.7-2.8 (2H, m), 3.20 (2H, dd), 3.40 (2H, d), 6.88 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 7

## 1-Cyclohexylmethyl-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride

Amount yielded 520 mg

Yield 51%

TLC Rf=0.75

MS 369 (M+)

NMR 0.8-2.1 (11H, m), 2.42 (2H, dd), 2.65 (2H, d), 2.78 (2H, d), 3.20 (2H, dd), 3.42 (2H, d), 6.91 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 8

## 1-Cyclohexyl-2-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethane hydrochloride

Amount yielded 780 mg

Yield 74%

TLC Rf=0.75

MS 383 (M+)

NMR 0.8-2.1 (13H, m), 2.45 (2H, dd), 2.67 (2H, d), 2.7-2.9 (2H, m), 3.0 (2H, dd), 3.48 (2H, d), 6.94 (2H, s), 7.1-7.4 (8H, m)

## EXAMPLE 9

## 1-Cyclohexyl-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride

Amount yielded 1.02 g

Yield 94%

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TLC Rf=0.77  
 MS 397 (M+)  
 NMR 0.8–2.1 (15H, m), 2.47 (2H, dd), 2.68 (2H, d),  
 2.7–2.9 (2H, m), 3.0 (2H, dd), 3.49 (2H, d), 6.94 (2H,  
 s), 7.1–7.4 (8H, m)

## EXAMPLE 10

1-Cyclohexyl-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride

Amount yielded 815 mg

Yield 72%

TLC Rf=0.78

MS 411 (M+)

NMR 0.8–2.1 (17H, m), 2.28 (2H, dd), 2.52 (2H, 2.7–2.9  
 (2H, m), 3.08 (2H, dd), 3.35 (2H, d), 6.92 (2H, s),  
 7.1–7.4 (8H, m)

## EXAMPLE 11

1-Cyclohexyl-5-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)pentane hydrochloride

Amount yielded 750 mg

Yield 65%

TLC Rf=0.80

MS 411 (M+)

NMR 0.8–2.1 (19H, m), 2.25 (2H, dd), 2.68 (2H, d),  
 2.7–2.9 (2H, m), 3.12 (2H, dd), 3.38 (2H, d), 6.92 (2H,  
 s), 7.1–7.4 (8H, m)

## EXAMPLE 12

1-Benzyl-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene) piperidine hydrochloride

Amount yielded 320 mg

Yield 80%

TLC Rf=0.42

MS 363 (M+)

NMR 2.28 (2H, dd), 2.52 (2H, d), 3.14 (2H, dd), 3.31 (2H,  
 d), 4.01 (2H, d), 6.90 (2H, s), 7.1–7.6 (13H, m)

## EXAMPLE 13

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylethane hydrochloride

Amount yielded 310 mg

Yield 75%

TLC Rf=0.45

MS 377 (M+)

NMR 2.28 (2H, dd), 2.51 (2H, d), 3.0–3.3 (6H, m), 3.47  
 (2H, d), 6.90 (2H, s), 7.1–7.4 (13H, m)

## EXAMPLE 14

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylpropane hydrochloride

Amount yielded 330 mg

Yield 77%

TLC Rf=0.50

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MS 391 (M+)

NMR 2.1–2.4 (4H, m), 2.51 (2H, d), 2.65 (2H, t), 2.7–2.9  
 (2H, m), 3.12 (2H, dd), 3.38 (2H, d), 6.90 (2H, s),  
 7.1–7.4 (13H, m)

## EXAMPLE 15

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylbutane hydrochloride

Amount yielded 180 mg

Yield 41%

TLC Rf=0.50

MS 405 (M+)

NMR 1.4–1.9 (4H, m), 2.28 (2H, dd), 2.52 (2H, d), 2.61  
 (2H, t), 2.7–2.8 (2H, m), 3.12 (2H, dd), 3.35 (2H, d),  
 6.90 (2H, s), 7.1–7.4 (13H, m)

## EXAMPLE 16

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylpentane hydrochloride

Amount yielded 110 mg

Yield 24%,

TLC Rf=0.55

MS 419 (M+)

NMR 1.2–1.9 (6H, m), 2.25 (2H, dd), 2.52 (2H, d), 2.60  
 (2H, t), 2.7–2.8 (2H, m), 3.08 (2H, dd), 3.35 (2H, d),  
 6.90 (2H, s), 7.1–7.4 (13H, m)

## EXAMPLE 17

6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylhexane hydrochloride

Amount yielded 315 mg

Yield 67%

TLC Rf=0.56

MS 433 (M+)

NMR 1.1–1.9 (8H, m), 2.26 (2H, dd), 2.56 (2H, d), 2.61  
 (2H, t), 2.7–2.8 (2H, m), 3.10 (2H, dd), 3.35 (2H, d),  
 6.91 (2H, s), 7.1–7.4 (13H, m)

## EXAMPLE 18

7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylheptane hydrochloride

Amount yielded 267 mg

Yield 55%

TLC Rf=0.56

MS 447 (M+)

NMR 1.1–1.9 (10H, m), 2.25 (2H, dd), 2.55 (2H, d), 2.65  
 (2H, t), 2.7–2.8 (2H, m), 3.07 (2H, dd), 3.32 (2H, d),  
 6.90 (2H, s), 7.1–7.4 (13H, m)

## EXAMPLE 19

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenoxyethane hydrochloride

Amount yielded 1.95 g

Yield 55%



TLC Rf=0.56  
 MS 393 (M+)  
 NMR (free base) 2.1–2.5 (2H, m), 2.58 (2H, t), 2.6–2.7 (2H, m), 4.05 (2H, t), 6.89 (2H, d), 6.92 (2H, s), 7.1–7.4 (11H, m)

## EXAMPLE 20

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenoxypropane hydrochloride

Amount yielded 2.15 g

Yield 48%

TLC Rf=0.58

MS 407 (M+)

NMR (free base) 1.97 (2H, tt), 2.1–2.5 (6H, m), 2.54 (2H, t), 2.6–2.7 (2H, m), 3.97 (2H, dd), 6.86 (2H, d), 6.90 (2H, s), 7.1–7.4 (11H, m)

## EXAMPLE 21

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenoxybutane hydrochloride

Amount yielded 1.18 g

Yield 86%

TLC Rf=0.61

MS 421 (M+)

NMR (free base) 1.8–2.7 (14H, m), 3.96 (2H, t), 6.87 (2H, d), 6.90 (2H, s), 7.1–7.4 (11H, m)

## EXAMPLE 22

2-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylthioethane hydrochloride

Amount yielded 0.97 g

Yield 87%

TLC Rf=0.55

MS 409 (M+)

NMR (free base) 2.0–2.6 (10H, m), 2.78 (2H, t), 6.86 (2H, s), 7.1–7.4 (11H, m)

## EXAMPLE 23

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylthiopropene hydrochloride

Amount yielded 0.85 g

Yield 74%

TLC Rf=0.62

MS 423 (M+)

NMR (free base) 1.73 (2H, tt), 2.0–2.6 (10H, m), 2.80 (2H, t), 6.88 (2H, d), 7.1–7.4 (11H, m)

## EXAMPLE 24

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-phenylthiobutane hydrochloride

Amount yielded 0.85 g

Yield 72%

TLC Rf=0.62

MS 437 (M+)

NMR (free base) 1.6–2.6 (14H, m), 2.80 (2H, t), 6.88 (2H, d), 7.1–7.4 (11H, m)

## EXAMPLE 25

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-(2-nitrobenzenesulfonyl)amino ethyl)piperidine hydrochloride

TLC Rf=0.72

MS 502 (M+)

## EXAMPLE 26

1-(2-(2-Aminobenzenesulfonyl)aminoethyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride

TLC Rf=0.51

MS 472 (M+)

## EXAMPLE 27

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-(2-ethoxycarbonylbenzenesulfonyl)aminoethyl)piperidine hydrochloride

TLC Rf=0.68

MS 544 (M+)

## EXAMPLE 28

3-(2-((4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl)-2,4(1H,3H)quinazolinedione hydrochloride

TLC Rf=0.85

MS 462 (M+)

## EXAMPLE 29

5,6-Benzo-2,4-diazo(2-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl) tetrahydrothiopyrane hydrochloride

TLC Rf=0.91

MS 498 (M+)

## EXAMPLE 30

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3,4-dimethoxyphenyl)ethane hydrochloride

TLC Rf=0.78

MS 450 (M+)

## EXAMPLE 31

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxy phenyl)-2-isopropylvaleronitrile hydrochloride

TLC Rf=0.92

MS 532 (M+)

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NMR 0.77 (3H, d), 1.18 (3H, d), 1.6–3.3 (15H, m), 3.86 (3H, s), 3.92 (3H, s), 6.8–7.4 (11H, m)

## EXAMPLE 32

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propyl-4-fluorophenylsulfoxide hydrochloride

TLC Rf=0.78  
MS 457 (M+)

## EXAMPLE 33

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propyl-4-fluorophenylsulfone hydrochloride

TLC Rf=0.62  
MS 473 (M+)

## EXAMPLE 34

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-(2-aminophenylthio)-1-propyl)piperidine hydrochloride

TLC Rf=0.84  
MS 439 (M+)

## EXAMPLE 35

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1-(2-benzoylamino)ethyl)piperidine hydrochloride

TLC Rf=0.84  
MS 420 (M+)

## EXAMPLE 36

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1-(2-N-phenylcarbamoylethyl)piperidine hydrochloride

TLC Rf=0.55  
MS 435 (M+)

## EXAMPLE 37

1-(3-(2-Cinnamoylamino)phenylthio)-1-propyl)-4-(5H-dibenzo[a,d]-cyclohepten-5-ylidene)piperidine hydrochloride

TLC Rf=0.66  
MS 568 (M+)

NMR (free base) 1.74 (2H, tt), 2.0–2.6 (8H, m), 2.80 (2H, t), 6.59 (1H, d), 6.88 (2H, s), 7.0–7.6 (16H, m), 7.75 (1H, d), 8.5 (1H, d), 8.68 (1H, bs)

## EXAMPLE 38

1-Cinnamyl-4-(5H-dibenzo[a, d]cyclohepten-5-ylidene)piperidine hydrochloride

TLC Rf=0.84  
MS 389 (M+)

NMR (free base) 2.1–2.7 (8H, m), 3.15 (2H, d), 6.25 (1H, td), 6.47 (1H, d), 6.90 (2H, s), 7.1–7.4 (13H, m)

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## EXAMPLE 39

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4,5-trimethoxyphenyl)-2-isopropylvaleronitrile hydrochloride

TLC Rf=0.80  
MS 563 (M+)

## EXAMPLE 40

2-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)-2-phenyl-1,3-dithiane-1,1,3,3-tetroxide hydrochloride

TLC Rf=0.48  
MS 573 (M+)

## EXAMPLE 41

2-(3,4-Dimethoxyphenyl)-2-(3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)-1,3-dithiane-1,1,3,3-tetroxide hydrochloride

TLC Rf=0.48  
MS 573 (M+)

## EXAMPLE 42

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dichlorophenyl)-2-isopropylvaleronitrile hydrochloride

TLC Rf=0.94  
MS 540 (M+)

## EXAMPLE 43

2-(3-Benzoylphenyl)-5-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methylvaleronitrile hydrochloride

TLC Rf=0.88  
MS 548 (M+)

## EXAMPLE 44

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2,2-diphenylvaleronitrile hydrochloride

TLC Rf=0.74  
MS 506 (M+)

## EXAMPLE 45

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3,4-dimethoxybutyrophenone hydrochloride

TLC Rf=0.61  
MS 479 (M+)

## EXAMPLE 46

6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylhexanenitrile hydrochloride

TLC Rf=0.86  
MS 430 (M+)

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## EXAMPLE 47

6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-phenylhexanenitrile hydrochloride

TLC Rf=0.88  
MS 472 (M+)

## EXAMPLE 48

6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-isopropylhexanenitrile hydrochloride

TLC Rf=0.81  
MS 546 (M+)

## EXAMPLE 49

7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylheptanenitrile hydrochloride

TLC Rf=0.84  
MS 444 (M+)

## EXAMPLE 50

7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-phenylheptanenitrile hydrochloride

TLC Rf=0.84  
MS 486 (M+)

## EXAMPLE 51

7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-isopropylheptanenitrile hydrochloride

TLC Rf=0.86  
MS 560 (M+)

## EXAMPLE 52

2-(3-Chloropropyl)-5-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylvaleronitrile hydrochloride

TLC Rf=0.92  
MS 506 (M+)

## EXAMPLE 53

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenyl-2-phenylthiovaleronitrile hydrochloride

TLC Rf=0.81  
MS 538 (M+)

## EXAMPLE 54

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-phenylthiovaleronitrile hydrochloride

TLC Rf=0.91  
MS 598 (M+)

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## EXAMPLE 55

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(1-naphthyl)valeronitrile hydrochloride

TLC Rf=0.85  
MS 580 (M+)

## EXAMPLE 56

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(1-naphthyl)-2-isopropylvaleronitrile hydrochloride

TLC Rf=0.90  
MS 522 (M+)

## EXAMPLE 57

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(2-naphthyl)valeronitrile hydrochloride

TLC Rf=0.85  
MS 480 (M+)

## EXAMPLE 58

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(2-naphthyl)-2-isopropylvaleronitrile hydrochloride

TLC Rf=0.87  
MS 522 (M+)

## EXAMPLE 59

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3-trifluoromethylphenyl)valeronitrile hydrochloride

TLC Rf=0.72  
MS 498 (M+)

## EXAMPLE 60

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(3-trifluoromethylphenyl)valeronitrile hydrochloride

TLC Rf=0.75  
MS 540 (M+)

## EXAMPLE 61

8-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenyloctanenitrile hydrochloride

TLC Rf=0.84  
MS 472 (M+)

## EXAMPLE 62

8-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-phenyloctanenitrile hydrochloride

TLC Rf=0.88  
MS 514 (M+)



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## EXAMPLE 63

8-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-isopropyloctanenitrile hydrochloride

TLC Rf=0.82  
MS 574 (M+)

## EXAMPLE 64

1-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)-1-indanenitrile hydrochloride

TLC Rf=0.90  
MS 456 (M+)

## EXAMPLE 65

1-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)-5,6-dimethoxy-1-indanenitrile hydrochloride

TLC Rf=0.85  
MS 516 (M+)

## EXAMPLE 66

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(1-methylpyrrol-2-yl)valeronitrile hydrochloride

TLC Rf=0.61  
MS 433 (M+)

## EXAMPLE 67

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(1-methylpyrrol-2-yl)valeronitrile hydrochloride

TLC Rf=0.71  
MS 475 (M+)

## EXAMPLE 68

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(pyrrol-2-yl)valeronitrile hydrochloride

TLC Rf=0.55  
MS 461 (M+)

## EXAMPLE 69

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3- $\alpha$ -hydroxybenzyl)phenyl-2-methylvaleronitrile hydrochloride

TLC Rf=0.51  
MS 550 (M+)

## EXAMPLE 70

2-(3-Benzoylphenyl)-6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methylhexanenitrile hydrochloride

TLC Rf=0.88  
MS 562 (M+)

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## EXAMPLE 71

6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3- $\alpha$ -hydroxybenzyl)phenyl-2-methylhexanenitrile hydrochloride

TLC Rf=0.52  
MS 564 (M+)

## EXAMPLE 72

2-(3-Benzoylphenyl)-7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methylheptanenitrile hydrochloride

TLC Rf=0.91  
MS 576 (M+)

## EXAMPLE 73

7-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3-( $\alpha$ -hydroxybenzyl)phenyl)-2-methylheptanenitrile hydrochloride

TLC Rf=0.52  
MS 578 (M+)

## EXAMPLE 74

2-(3-Benzoylphenyl)-8-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methyloctanenitrile hydrochloride

TLC Rf=0.90  
MS 590 (M+)

## EXAMPLE 75

8-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3-( $\alpha$ -hydroxybenzyl)phenyl)-2-methyloctanenitrile hydrochloride

TLC Rf=0.61  
MS 592 (M+)

## EXAMPLE 76

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.91  
MS 544 (M+)

## EXAMPLE 77

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-methylvaleronitrile hydrochloride

TLC Rf=0.85  
MS 504 (M+)

## EXAMPLE 78

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-ethyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.92  
MS 458 (M+)



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## EXAMPLE 79

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-ethylvaleronitrile hydrochloride

TLC Rf=0.90  
MS 518 (M+)

## EXAMPLE 80

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-propyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.93  
MS 472 (M+)

## EXAMPLE 81

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-propylvaleronitrile hydrochloride

TLC Rf=0.91  
MS 532 (M+)

## EXAMPLE 82

2-Butyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 486 (M+)

## EXAMPLE 83

2-Butyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)valeronitrile hydrochloride

TLC Rf=0.90  
MS 546 (M+)

## EXAMPLE 84

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-pentyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 500 (M+)

## EXAMPLE 85

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-pentylvaleronitrile hydrochloride

TLC Rf=0.92  
MS 560 (M+)

## EXAMPLE 86

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-hexyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 514 (M+)

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## EXAMPLE 87

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-hexylvaleronitrile hydrochloride

TLC Rf=0.92  
MS 574 (M+)

## EXAMPLE 88

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-heptyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 528 (M+)

## EXAMPLE 89

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-heptylvaleronitrile hydrochloride

TLC Rf=0.91  
MS 588 (M+)

## EXAMPLE 90

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-octyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.94  
MS 542 (M+)

## EXAMPLE 91

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-octylvaleronitrile hydrochloride

TLC Rf=0.94  
MS 602 (M+)

## EXAMPLE 92

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-nonyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 556 (M+)

## EXAMPLE 93

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)-2-nonylvaleronitrile hydrochloride

TLC Rf=0.93  
MS 616 (M+)

## EXAMPLE 94

2-Decyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylvaleronitrile hydrochloride

TLC Rf=0.95  
MS 570 (M+)

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## EXAMPLE 95

2-Decyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)valeronitrile hydrochloride

TLC Rf=0.94  
MS 630 (M+)

## EXAMPLE 96

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-acetophenone hydrochloride

TLC Rf=0.71  
MS 391 (M+)

## EXAMPLE 97

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-phenylethane hydrochloride

TLC Rf=0.36  
MS 393 (M+)

## EXAMPLE 98

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propiofenone hydrochloride

TLC Rf=0.74  
MS 405 (M+)

## EXAMPLE 99

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-phenylpropane hydrochloride

TLC Rf=0.35  
MS 407 (M+)

## EXAMPLE 100

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyrophenone hydrochloride

TLC Rf=0.75  
MS 419 (M+)

## EXAMPLE 101

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-phenylbutane hydrochloride

TLC Rf=0.39  
MS 421 (M+)

## EXAMPLE 102

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)valerophenone hydrochloride

TLC Rf=0.76  
MS 433 (M+)

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## EXAMPLE 103

5-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-phenylpentane hydrochloride

TLC Rf=0.78  
MS 447 (M+)

## EXAMPLE 104

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4'-fluoroacetophenone hydrochloride

TLC Rf=0.80  
MS 409 (M+)

## EXAMPLE 105

2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-(4-fluorophenyl)ethane hydrochloride

TLC Rf=0.44  
MS 411 (M+)

## EXAMPLE 106

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4'-fluoropropiofenone hydrochloride

TLC Rf=0.80  
MS 423 (M+)

## EXAMPLE 107

3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-(4-fluorophenyl)propane hydrochloride

TLC Rf=0.44  
MS 425 (M+)

## EXAMPLE 108

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-(4-fluorophenyl)butane hydrochloride

TLC Rf=0.45  
MS 439 (M+)

## EXAMPLE 109

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4'-fluorovalerophenone hydrochloride

TLC Rf=0.84  
MS 451 (M+)

## EXAMPLE 110

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-hydroxy-1-(4-fluorophenyl)pentane hydrochloride

TLC Rf=0.51  
MS 453 (M+)



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## EXAMPLE 111

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-fluorobenzyl)piperidine hydrochloride

TLC Rf=0.75  
MS 381 (M+)

## EXAMPLE 112

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-fluorobenzyl)piperidine hydrochloride

TLC Rf=0.79  
MS 381 (M+)

## EXAMPLE 113

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-fluorobenzyl)piperidine hydrochloride

TLC Rf=0.61  
MS 381 (M+)

## EXAMPLE 114

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-trifluoromethylbenzyl)piperidine hydrochloride

TLC Rf=0.83  
MS 431 (M+)

## EXAMPLE 115

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-trifluoromethylbenzyl)piperidine hydrochloride

TLC Rf=0.82  
MS 431 (M+)

## EXAMPLE 116

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride

TLC Rf=0.79  
MS 431 (M+)

## EXAMPLE 117

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-methoxybenzyl)piperidine hydrochloride

TLC Rf=0.61  
MS 393 (M+)

## EXAMPLE 118

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methoxybenzyl)piperidine hydrochloride

TLC Rf=0.61  
MS 393 (M+)

## EXAMPLE 119

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-methoxybenzyl)piperidine hydrochloride

TLC Rf=0.52  
MS 393 (M+)

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## EXAMPLE 120

4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-pentafluorobenzylpiperidine hydrochloride

TLC Rf=0.80  
MS 453 (M+)

## EXAMPLE 121

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-phenylvaleronitrile hydrochloride

TLC Rf=0.86  
MS 440 (M+)

## EXAMPLE 122

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-phenylvaleronitrile hydrochloride

TLC Rf=0.82  
MS 488 (M+)

## EXAMPLE 123

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3,4-dimethoxyphenyl)valeronitrile hydrochloride

TLC Rf=0.75  
MS 500 (M+)

## EXAMPLE 124

2-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl-2-(4-fluorophenyl)-1,3-dioxolane hydrochloride

TLC Rf=0.68  
MS 481 (M+)

## EXAMPLE 125

4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4'-fluorobutyrophenone hydrochloride

TLC Rf=0.82  
MS 437 (M+)

## EXAMPLE 126

5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(3,4,5-trimethoxyphenyl)valeronitrile hydrochloride

TLC Rf=0.66  
MS 562 (M+)

exp	compound	MD (M+)	TLC (Rf)	solvent
127	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(4-fluorophenyl)ethane hydrochloride	395	0.55	B
128	1-(2-Chlorobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	397	0.68	B
129	1-(3-Chlorobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	397	0.58	B
130	1-(4-Chlorobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	397	0.58	B
131	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-methylbenzyl)piperidine hydrochloride	377	0.74	B
132	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methylbenzyl)piperidine hydrochloride	377	0.71	B
133	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-methylbenzyl)piperidine hydrochloride	377	0.65	B
134	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-heptylpiperidine hydrochloride	371	0.70	B
135	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-nondecylpiperidine hydrochloride	399	0.75	B
136	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-undecylpiperidine hydrochloride	427	0.75	B
137	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-tridecylpiperidine hydrochloride	455	0.78	B
138	1-(2-Aminobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	392	0.38	B
139	1-(3-Aminobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	392	0.23	B
140	1-(4-Aminobenzyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	392	0.26	B
141	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-nitrobenzyl)piperidine hydrochloride	422	0.85	B
142	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-nitrobenzyl)piperidine hydrochloride	422	0.82	B
143	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-nitrobenzyl)piperidine hydrochloride	422	0.83	B
144	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3-fluorophenyl)-2-isopropylvaleronitrile hydrochloride	500	0.71	B
145	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(3-methoxyphenyl)valeronitrile hydrochloride	512	0.64	B
146	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(3-methylphenyl)valeronitrile hydrochloride	496	0.68	B
147	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(2-trifluoromethylphenyl)valeronitrile hydrochloride	549	0.78	B
148	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-isopropyl-2-(4-trifluoromethylphenyl)valeronitrile hydrochloride	540	0.77	B
149	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-ethyl-2-(3-trifluoromethylphenyl)valeronitrile hydrochloride	526	0.77	B
150	2-Butyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(3-trifluoromethylphenyl)valeronitrile hydrochloride	554	0.80	B
151	5-(4-(5H-Dibenzo[ac]cyclohepten-5-ylidene)-1-piperidinyl)-2-hexyl-2-(3-trifluoromethylphenyl)valeronitrile hydrochloride	582	0.80	B
152	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-phenyl-1-butene hydrochloride	403	0.51	B
153	1-Benzyloxy-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethane hydrochloride	407	0.58	B
154	1-Cyclohexyl-6-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)hexane hydrochloride	439	0.62	B
155	1-Cyclohexyl-7-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)heptane hydrochloride	453	0.65	B
156	1-Cyclohexyl-8-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)octane hydrochloride	467	0.68	B
157	1-(4-Cyclohexylbutanoyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine	425	0.75	B
158	1-(2-Cyanobenzyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	388	0.83	B
159	1-(3-Cyanobenzyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	388	0.85	B
160	1-(4-Cyanobenzyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	388	0.70	B
161	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-Picolyl)piperidine dihydrochloride	364	0.58	B
162	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-Picolyl)piperidine dihydrochloride	364	0.53	B
163	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-Picolyl)piperidine dihydrochloride	364	0.44	B
164	1-Decanoyl-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine	427	0.75	B
165	1-Cyano-3-[4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl]propane hydrochloride	340	0.58	B
166	1-Cyano-4-[4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl]propane hydrochloride	354	0.52	B
167	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxyacetophenone hydrochloride	451	0.85	B
168	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxypropiofenone hydrochloride	465	0.61	B
169	5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxyvalerophenone hydrochloride	193	0.64	B
170	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4',5'-trimethoxybutyrophenone hydrochloride	509	0.82	B
171	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2',3',4'-trimethoxybutyrophenone hydrochloride	509	0.86	B
172	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4'-trimethoxybutyrophenone hydrochloride	449	0.61	B
173	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2,3-dimethoxybenzyl)piperidine hydrochloride	423	0.63	B
174	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4-dimethoxybenzyl)piperidine hydrochloride	423	0.73	B
175	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4-dimethoxybenzyl)piperidine	437	0.58	B
176	1-Cyclohexyl-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propylketone hydrochloride	425	0.51	B
177	2-Cyclohexyl-5-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)valeronitrile hydrochloride	436	0.60	B
178	1-(4-(3-Chloro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4-cyclohexylbutane hydrochloride	445	0.62	B
179	1-Cyclohexyl-4-(3-methoxy-5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinylbutane hydrochloride	441	0.59	B
180	4,9-Dihydro-4-(1-(4-cyclohexylbutyl)-4-piperidinylidene)-10H-benzo[4,5]cyclohepta[1,2-b]thiophen-10-one hydrochloride	433	0.45	B
181	1-(4-Cyclohexylbutyl)-4-(9-xantylidene)piperidine hydrochloride	401	0.64	B
182	1-(4-Cyclohexylbutyl)-4-(9-thioxantylidene)piperidine hydrochloride	417	0.65	B
183	6,11-Dihydro-11-(1-(4-cyclohexylbutyl)-4-piperidinylidene)-5H-dibenzop[5,6]cyclohepta[1,2-b]pyridine dihydrochloride	414	0.41	B
184	4-(10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methoxybenzyl)piperidine hydrochloride	395	0.73	B
185	1-Decyl-4-(10,11-Dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	415	0.52	B
186	1-Cyclohexyl-4-(10,11-Dihydro-5H-dibenzo[a,d]cycloheptan-5-ylidene)-1-piperidinylbutane hydrochloride	413	0.67	B
187	4-(4-(10,11-Dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxybutyrophenone hydrochloride	481	0.66	B



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exp	compound	MD (M+)	TLC (Rf)	solvent
188	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4,5-trimethoxybenzyl)piperidine	453	0.69	B
189	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4,5-trimethoxybenzoyl)piperidine	467	0.71	B
190	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-methylbenzoyl)piperidine	391	0.73	B
191	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-(4-fluorophenyl)acetyl)piperidine	409	0.76	B
192	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-dimethoxycinnamoyl)piperidine	463	0.73	B
193	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-dimethoxycinnamyl)piperidine hydrochloride	449	0.46	B
194	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-diethoxybutyrophenone hydrochloride	501	0.49	B
195	1-(4-(4-Aminophenyl)butyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	420	0.34	B
196	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-(4-nitrophenyl)butyl)piperidine hydrochloride	450	0.50	B
197	1-(4-(4-Acetylaminophenyl)butyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	462	0.48	B
198	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethylbutyrophenone hydrochloride	447	0.53	B
199	Ethyl 4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyrate hydrochloride	387	0.51	B
200	4-((4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyric acid	359	0.15	B
201	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-(3',4'-dimethoxyphenyl)propyl)piperidine hydrochloride	451	0.60	B
202	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-(3',4'-dimethoxyphenyl)propanoyl)piperidine	465	0.78	B
203	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoyl)piperidine hydrochloride	426	0.60	B
204	N-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoyl)-1,2,3,4-tetrahydroisoquinoline hydrochloride	474	0.42	B
205	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3,4-dimethoxy)phenyl-1-hydroxybutane hydrochloride	481	0.38	B
206	1-Acetoxy-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-(3,4-dimethoxy)phenylbutane hydroxybutane hydrochloride	523	0.49	B
207	1-butyl-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3,4-dimethoxy)phenyl-1-hydroxybutane hydroxybutane hydrochloride	537	0.45	B
208	1-(4-Methoxyxylohexyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydroxybutane hydrochloride	441	0.55	B
209	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyl)piperidine dihydroxybutane hydrochloride	412	0.03	B
210	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-N-imidazolylmethyl)cinnamyl)piperidine dihydroxybutane hydrochloride	469	0.44	B
211	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-naphthoyl)piperidine	427	0.88	B
212	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-naphthylmethyl)piperidine hydrochloride	413	0.94	B
213	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1-naphthoyl)piperidine	427	0.59	B
214	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1-naphthylmethyl)piperidine hydrochloride	413	0.83	B
215	2-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyl)cyclohexanone hydrochloride	426	0.50	B
216	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoyl)-4-hydroxypiperidine hydrochloride	442	0.58	B
217	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoyl)-4-ethoxycarbonpiperidine hydrochloride	499	0.26	B
218	Cyclohexyl 3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propylether hydrochloride	413	0.48	B
219	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-butyl)-1-methoxycarbonylcyclohexane hydrochloride	470	0.55	B
220	Ethyl 2-cyclohexyl-5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)valerate hydrochloride	483	0.65	B
221	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-(3',4'-dimethoxyphenyl)butyl)piperidine hydrochloride	465	0.66	B
222	2-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl-2-(3,4-dimethoxyphenyl)-1,3-dioxolane hydrochloride	523	0.54	B
223	1-Carboxyl-1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyl)cyclohexane hydrochloride	456	0.38	B
224	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1,2,3,4-tetrahydro-2-naphthoyl)piperidine	(H+) 431	0.90	B
225	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(1,2,3,4-tetrahydro-2-naphthylmethyl)piperidine	417	0.55	B
226	N-(3,(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propanoyl)cyclohexylamine hydrochloride	426	0.64	B
227	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl cyclohexanecarboxylate hydrochloride	427	0.71	B
228	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-cyclohexylbutane hydrochloride	431	0.74	B
229	4-(4-(5H-Dibenzo[a,d]thiopin-5-ylidene)-1-piperidinyl)-3,4-dimethoxybutyrophenone hydrochloride	499	0.46	B
230	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-nitrocinnamyl)piperidine hydrochloride	434	0.70	B
231	1-(4-Aminocinnamyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	404	0.36	B
232	1-(4-Acetylaminocinnamyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	446	0.27	B
233	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-furyl)-1-butanone hydrochloride	409		B
234	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-thienyl)-1-butanone hydrochloride	425		B
235	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl(2-tetrahydropyranyl)ether hydrochloride	415	0.55	B
236	Cyclohexyl 3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propionate hydrochloride	427	0.71	B
237	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl-4-nitrobenzamide hydrochloride	465	0.49	H
238	2-Cyclohexyl-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyric acid	455	0.26	B
239	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl phenylsulphoxide hydrochloride	409	0.29	H
240	2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl-5',6'-dimethoxyindan hydrochloride	477	0.41	B
241	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl phenylsulphone hydrochloride	441	0.36	B
242	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl-3',4'-dimethoxybenzamide hydrochloride	480	0.44	G
243	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl cyclohexanecarboxamide hydrochloride	426	0.75	B
244	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl isonicotinamide hydrochloride	421	0.20	B
245	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoyl)morpholine hydrochloride	428	0.31	C
246	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butanoylthiomorpholine hydrochloride	444	0.43	C
247	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(4-notrophenyl)propane hydrochloride	436	0.34	H
248	1-(4-Aminophenyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	406	0.13	B
249	1-(4-Acetylaminophenyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	448	0.43	B



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exp	compound	MD (M+)	TLC (Rf)	solvent
250	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-nitrophenyl)propane hydrochloride	436	0.53	H
251	1-(2-Aminophenyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	406	0.52	B
252	1-(2-Acetylaminophenyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	448	0.51	B
253	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethylphenylsulphoxide hydrochloride	425	0.20	H
254	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl phenylsulphone hydrochloride	455	0.71	B
255	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-nitrophenyl)butane hydrochloride	450	0.49	H
256	Cyclohexyl-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propylsulphide hydrochloride	430	0.17	J
		(H+)		
257	Cyclohexyl-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propylsulphoxide hydrochloride	445	0.51	B
258	Cyclohexyl-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propylsulphone hydrochloride	462	0.28	H
		(H+)		
259	Ethyl 2-cyclohexylmethyl-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyrate hydrochloride	483	0.70	B
260	1-(4-acetyl-amino-1-cyclohexyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride	468	0.43	B
261	2-(2-4-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-5',6'-dimethoxy-1-indanone hydrochloride	477	0.41	B
262	Ethyl 2-(2-cyclohexylethyl-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propionate hydrochloride	483	0.74	B
263	Cyclohexylmethyl-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylsulfone hydrochloride	461	0.94	B
264	Cyclohexylmethyl-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethylsulfoxide hydrochloride	441	0.48	B
		(H+)		
265	Cyclohexylmethyl-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethylsulfide hydrochloride	429	0.85	B
266	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-4-amino-6,7-dimethoxyquinazoline dihydrochloride	476	0.34	B
267	N-Acetyl-N-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)cyclohexylamine hydrochloride	454	0.35	B
268	N-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-2-piperidone hydrochloride	426	0.39	B
269	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-1-ethoxycarbonylcyclohexane hydrochloride	483	0.82	B
270	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3-pyridyl)propane dihydrochloride	392	0.44	B
271	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxybutyrophenone N-oxide	477	0.45	B
		(M-18)		
272	1-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-1-hydroxymethylcyclohexane hydrochloride	441	0.55	B
273	1-Acetoxyethyl-1-(4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)cyclohexane hydrochloride	483	0.86	B
274	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-methyl-3',4'-dimethoxybutyrophenone hydrochloride	493	0.22	B
275	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(2-propyl)-3',4'-dimethoxybutyrophenone hydrochloride	521	0.28	H
276	2-Allyl-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-3',4'-dimethoxybutyrophenone hydrochloride	519	0.30	H
277	4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-(1-propyl)-3',4'-dimethoxybutyrophenone hydrochloride	521	0.38	H
278	4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-ethyl-3',4'-dimethoxybutyrophenone hydrochloride	507	0.33	H
279	Cyclohexylmethyl-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-2-ethyl)ether hydrochloride	413	0.73	B
280	1-(n-Acetyl-3-piperidinyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride	440	0.75	B
281	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3-piperidinyl)propane dihydrochloride	398	0.16	A
282	1-(3-Acetyl-amino-4-methoxyphenyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride	492	0.58	B
283	4-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)cyclohexane hydrochloride	425	0.63	B
284	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-pyridyl)-1-propane hydrochloride	390	0.66	H
285	2,6-Dimethyl-4-(4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butyl)-5-methyl-1,4-dihydropyridine-3,5-dicarboxylate hydrochloride	528	0.30	F
286	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2,3-dimethoxyphenyl)propane hydrochloride	451	0.68	H
287	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methyl-5',6'-dimethoxyindan hydrochloride	463	0.59	H
288	2,6-Dimethyl-4-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-5-methylpyridine-3,5-dicarboxylate dihydrochloride	527	0.68	B
289	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(4-pyridyl)propane dihydrochloride	392	0.37	B
290	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl-3-nitrobenzamide hydrochloride	466	0.48	D
		(H+)		
291	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl-2-nitrobenzamide hydrochloride	466		D
		(H+)		
292	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethyl-2,4-dimethoxybenzamide hydrochloride	481	0.31	D
		(H+)		
293	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-pyrrole)-1-butane hydrochloride	409		B
		(H+)		
294	1-(N-Acetyl-2-piperidinyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride	440	0.30	B
295	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(N-methyl-3-piperidinyl)butane dihydrochloride	426	0.07	B
296	1-(1-(4-Hydroxy)cyclohexyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride	427	0.45	B
297	1-(1-(4-Cyano)cyclohexyl)-4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride	436	0.55	F
298	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-methoxyphenyl)propane hydrochloride	421	0.81	B
299	1-(1-(3-Methoxy)cyclohexyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane	441	0.71	B



-continued

exp	compound	MD (M+)	TLC (Rf)	solvent
	hydrochloride			
300	1-(1-(3-Hydroxyoxy)cyclohexyl)-4-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane hydrochloride	427	0.47	B
301	3-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)cyclohexanoe hydrochloride	425	0.70	B
302	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-nitrocinnamyl)piperidinyl hydrochloride	434	0.91	B
303	1-(2-Aminocinnamyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride	404	0.62	B
304	1-(2-Acetylaminocinnamyl)-4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride	446	0.55	B
305	4-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)tetrahydropyran hydrochloride	413	0.69	B
306	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-nitrocinnamyl)piperidine hydrochloride	984	0.90	B
307	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2-piperidinyl)propane dihydrochloride	398	0.07	A
308	1-(N-acetyl-4-piperidinyl)-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride	440	0.23	H
309	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	398	0.03	B
310	2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)indane hydrochloride	417	0.59	B
311	4-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-2,4,5,6-tetramethyl-1,4-dihydropyridino-3,5-dicarboxylate hydrochloride	524	0.68	B
312	4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(N-ethoxycarbonyl-3-piperidinyl)butane hydrochloride	484	0.64	B
313	1-(5-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-pentyl)-1-methoxycarbonylcyclohexane hydrochloride	483	0.72	B
314	1-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-propyl)-1-methoxycarbonylcyclohexane hydrochloride	455	0.75	B
315	1-(3-Aminophenyl)-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane dihydrochloride	993	0.62	B
316	1-(3-Acetylaminophenyl)-3-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride	994	0.48	B
317	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3,4,5-trimethoxyphenyl)propane dihydrochloride	481	0.65	B
318	2-(3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-5,6-dimethoxy-1,2,3,4-tetrahydronaphthalene hydrochloride	491	0.21	H
319	6-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methyl-2,3-dimethoxybenzocycloheptene hydrochloride	491	0.56	H
320	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4,5-trimethoxycinnamyl)piperidine hydrochloride	479	0.69	B
321	1-(N-Acetyl-4-piperidinyl)-5-(4-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-pentene dihydrochloride	466	0.33	B
322	2-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-3,4,5,6-tetramethyl-1,4-dihydropyridine-3,5-dicarboxylate hydrochloride	1000	0.30	B
323	2-(4-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-butyl)-3,4,5,6-tetramethylpyridine-3,5-dicarboxylate hydrochloride	550	0.43	B
324	1-(1-(4-Methoxy)cycloheptyl)-3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)propane hydrochloride	427	0.48	B
325	(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-nitrocinnamyl)piperidine hydrochloride	454	0.89	B
326	1-(4-Aminocinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine dihydrochloride	424	0.65	B
327	1-(4-Acetylaminocinnamyl)-4-(5H-Dibenzo[a,d]thiopyz-5-ylidene)-1-piperidine hydrochloride	466	0.58	B
328	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(2,4-dimethoxyphenyl)propane dihydrochloride	451	0.64	B
329	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methyl-4'-nitroindan hydrochloride	448	0.49	I
330	4'-Amino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methylindan hydrochloride	418	0.38	H
331	4'-Acetylamino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methylindan hydrochloride	460	0.33	B
332	2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methyl-5'-nitroindan hydrochloride	448	0.51	I
333	5'-Amino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methylindan hydrochloride	418	0.34	B
334	5'-acetylamino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)methylindan hydrochloride	460	0.29	H
335	4-Amino-N-(2-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylbenzamide hydrochloride	435		B
336	3-Amino-N-(2-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylbenzamide hydrochloride	435		B
337	1-Formyl-N-(2-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylisonicotinamide hydrochloride	455		B
338	1-Formyl-N-(2-(5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylisonicotinamide hydrochloride	455		B
339	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylnicotinamide hydrochloride	421	0.42	B
340	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylnicotinamide N-oxide hydrochloride	437	0.27	D
341	N-(2-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)ethylisonicotinamide N-oxide hydrochloride	437	0.30	D
		(H+)		
342	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2,4-dimethoxycinnamyl)piperidine hydrochloride	449	0.73	B
343	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2,5-dimethoxycinnamyl)piperidine hydrochloride	449	0.73	B
344	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2,3-dimethoxycinnamyl)piperidine hydrochloride	449	0.90	B
345	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,5-dimethoxycinnamyl)piperidine hydrochloride	449	0.74	B
346	1-(4-Cyanocinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride	414	0.70	B
347	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-methoxycinnamyl)piperidine hydrochloride	419	0.87	B
348	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methoxycinnamyl)piperidine hydrochloride	419	0.89	B
349	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride	419	0.85	B
350	4-(10,11-Dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-nitrocinnamyl)piperidine hydrochloride	436	0.93	B
351	1-(4-Aminocinnamyl)-4-(10,11-dihydro-5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine dihydrochloride	406	0.64	B
352	1-(4-Acetylaminocinnamyl)-4-(10,11-dihydro-5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine dihydrochloride	448	0.54	B
353	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-4-fluorocinnamyl)piperidine hydrochloride	407	0.88	B
354	2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-4'-nitroindan hydrochloride	462	0.34	H
355	4'-Amino-2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)indan hydrochloride	432	0.53	B
356	4'-Caetylamino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)indan hydrochloride	474	0.24	B
357	2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-5'-nitroindan hydrochloride	462	0.31	H
358	5'-Amino-2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)indan dihydrochloride	432	0.23	H
359	5'-Acetylamino-2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)indan dihydrochloride	474	0.05	H



-continued

exp	compound	MD (M+)	TLC (Rf)	solvent
360	2-(2-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-ethyl)-5'-methanesulfonylaminoindan hydrochloride	510	0.11	H
361	1-(Cyclohexyl-4-(4-(10,11-dihydroxy-5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)butane	445	0.84	B
362	3-(4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidinyl)-1-(3-pyridyl)-1-propene dihydrochloride	390	0.44	B
363	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-hydroxycinnamyl)piperidine hydrochloride	406	0.55	B
		(H+)		
364	1-(4-Acetoxy-cinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	447	0.87	B
365	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-hydroxy-3-methoxycinnamyl)piperidine hydrochloride	435	0.63	B
366	1-(4-Acetoxy-3-methoxycinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-piperidine hydrochloride	477	0.83	B
367	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-hydroxycinnamyl)piperidine hydrochloride	405	0.45	B
368	1-(3-Acetoxy-cinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	447	0.80	B
369	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-(2-methoxyacetoxy)cinnamyl)piperidine hydrochloride	477	0.65	B
370	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-propanoylamino-cinnamyl)piperidine hydrochloride	460	0.21	H
371	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-ethoxycarbonylamino-cinnamyl)piperidine hydrochloride	476	0.20	H
372	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-methanesulfonylamino-cinnamyl)piperidine hydrochloride	482	0.44	B
373	1-(N,N-Bis(methanesulfonyl)amino-cinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	560	0.88	B
374	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-methoxycarbonylcinnamyl)piperidine hydrochloride	447	0.55	B
375	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methoxycarbonylcinnamyl)piperidine hydrochloride	447	0.48	H
376	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-methoxycarbonylcinnamyl)piperidine hydrochloride	447	0.50	B
377	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-3-methoxy-2-nitrocinnamyl)piperidine hydrochloride	464	0.30	H
378	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-methoxycarbonylamino-cinnamyl)piperidine hydrochloride	462	0.53	B
379	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-pivaloyamino-cinnamyl)piperidine hydrochloride	488	0.51	B
380	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-trifluoroacetylaminocinnamyl)piperidine hydrochloride	500	0.44	B
381	1-(4-Butanoylamino-cinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	474	0.50	B
382	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-ethoxycarbonylcinnamyl)piperidine hydrochloride	477	0.85	B
383	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(4-(2-methoxyacetoxy)cinnamyl)piperidine hydrochloride	477	0.45	B
384	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3,4-dihydroxycinnamyl)piperidine hydrochloride	422	0.35	B
		(H+)		
385	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(2-indolylmethyl)piperidine hydrochloride	402	0.67	H
386	1-(4-Aminosulfonylcinnamyl)-4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)piperidine hydrochloride	468	0.48	B
		(H+)		
387	4-(5H-Dibenzo[a,d]cyclohepten-5-ylidene)-1-(3-methoxy-4-nitrocinnamyl)piperidine hydrochloride	464	0.29	H

solvent: solvent for TLC

A: chloroform/methanol = 4/1

B: chloroform/methanol = 9/1

C: chloroform/methanol = 20/1

D: chloroform/methanol = 25/1

E: chloroform/methanol = 50/1

F: ethylacetate/hexane = 5/1

G: ethylacetate/hexane = 3/1

H: ethylacetate/hexane = 1/1

I: ethylacetate/hexane = 1/2

G: ethylacetate/hexane = 1/5

## EXAMPLE 154

As test animals, four male spontaneously hypertensive rats (weight 400 to 440 g) that were sufficiently adapted for feeding and in which hypertension was confirmed were used.

Physiological saline aqueous solution containing 2.5% Nicolle and 2.5% ethanol of sample was intravenously administered by bolus injection at a dose of 1 ml per 1 kg of body weight. Systolic blood pressure after administration was measured by the indirect (tail-cuff) method.

The results are shown below.

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)	
		0.5	4
1	10	-67	1
2	10	-125	-34
3	3	-110	-22
4	10	-76	0
5	10	-56	-20

-continued

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)	
		0.5	4
7	10	-57	-15
8	10	-95	-21
9	10	-91	-19
10	10	-129	-21
11	10	-166	
12	10	-27	1
13	10	-47	4
14	10	-105	-10
15	10	-130	-136
16	10	-114	-30
17	10	-84	-16
20	10	-37	2
23	10	-34	10
25	10	-8	-7
28	10	-52	4
31	10	-61	-11
37	10	-78	-36
38	10	-140	-76
42	10	-66	-14
45	10	-147	-38



-continued

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)		5
		0.5	4	
52	10	-23	-9	
59	10	-87	-21	
60	10	-121	-48	
100	10	-35	-5	10
101	10	-89	-14	
107	10	-88	-11	
108	10	-126	-50	
111	10	-98	-13	
112	10	-16	0	
113	1	-151	-81	15
115	10	-53	-19	
116	10	-36	-12	
117	10	-143	-25	
118	10	-129	-24	
119	10	-34	-5	
120	3	-17	-12	20
121	10	-42	-19	
122	10	-120	-62	
123	10	-55	-7	
124	10	-90	-20	
125	10	-93	-14	
126	10	-87	-19	
128	10	-129	-8	25
129	10	-17	-1	
130	10	-42	9	
131	10	-116	2	
132	10	-106	-5	
133	3	-146	-84	30
134	10	-115	-30	
135	10	-132	-50	
136	10	-100	-40	
138	10	-129	-33	
139	10	-139	-89	
140	3	-113	-101	
142	10	-43	0	35
149	10	-116	-32	
150	10	-110	-47	
151	10	-81	-43	
154	10	-131	-105	
155	10	-131	-105	
156	10	-110	-42	40
157	10	-32	-13	
158	10	-8	7	
159	10	-27	-12	
160	10	-3	-10	
161	10	-64	-12	
162	10	-62	-3	
163	10	-1	4	45
164	10	-91	-22	
165	10	-22	12	
166	10	-45	6	
168	10	-108	0	
169	10	-130	-4	
171	10	-122	-8	50
172	10	-115	-25	
173	10	-98	-25	
174	10	-8	-16	
175	10	-87	-1	
176	10	-105	-10	
180	10	-25	-24	55
181	10	-56	-27	
182	10	-11	-6	
184	10	-16	-4	
185	10	-66	-10	
186	10	-95	-12	
187	10	-47	-9	60
188	10	-94	-12	
189	10	-72	-15	
190	10	-11	-15	
191	10	-29	-20	
192	10	-25	-36	
193	10	-124	-59	
194	10	-59	-17	65
195	10	-100	-51	

-continued

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)	
		0.5	4
196	10	-145	-81
197	10	-51	-26
198	10	-124	-25
199	10	-15	-24
200	10	-10	-24
201	10	-118	-21
202	10	-54	-16
203	3	-123	-58
204	10	-141	-84
205	10	-22	-4
206	10	-61	-27
207	10	-98	-43
208	10	-131	-19
209	10	-49	-13
210	1	-78	-69
212	10	-155	
213	10	-82	3
214	10	-126	-21
215	10	-128	-14
216	3	-2	-27
217	10	-18	-20
218	10	-97	-11
219	10	-104	-33
220	10	-148	-54
221	10	-70	-13
222	10	-94	-5
224	10	-69	-61
225	10	-115	-31
226	10	-131	-16
228	3	-112	-14
229	3	-77	-14
230	3	-131	-91
231	3	-132	-115
232	1	-92	-85
233	10	-35	-1
234	10	-96	-2
235	10	-99	-5
236	10	-10	-15
237	10	-65	-14
238	10	-14	-5
239	10	-68	-15
240	3	-118	-5
241	10	-73	-4
242	10	-28	7
243	10	-111	-31
244	10	-19	4
245	10	-34	-10
246	10	-34	-4
247	10	-119	-40
248	10	-101	-92
249	10	-121	-100
250	10	-136	-30
251	10	-110	-24
252	10	-23	-5
253	10	-12	1
255	10	-62	2
256	10	-60	-11
257	10	-70	-13
258	10	-74	-10
259	10	-46	-5
260	10	-51	-10
261	10	-123	-11
262	10	-16	-3
264	10	-38	-5
265	10	-61	-11
266	10	-133	-77
267	10	-40	0
268	10	-29	13
269	10	143	-71
270	10	-18	2
271	10	-17	-13
272	10	-76	-3
273	10	-37	5
274	10	-102	-21

-continued

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)		5
		0.5	4	
275	10	-66	-20	
276	10	-24	-1	
277	10	-27	0	
278	10	-64	2	10
279	3	-83	-24	
280	10	-50	-11	
281	10	-31	-5	
282	10	-72	-15	
283	10	-112	4	
284	3	-151	-40	15
285	10	-62	-7	
286	10	-134	-40	
287	10	-83	-16	
288	10	-92	-14	
289	3	-20	10	
290	3	-15	15	20
291	3	-8	15	
292	3	-31	3	
293	10	-122	4	
294	3	-17	7	
295	3	-36	1	
296	10	-109	-14	
297	10	-129	-57	
298	10	-111	-31	
299	10	-134	-45	
300	10	-97	-22	
301	10	-100	-12	
302	10	-83	-41	
303	3	-90	-19	
304	10	-49	-5	
305	10	-95	-9	
306	10	-138	-37	
307	10	-62	-20	
308	3	-27	-5	
310	10	-90	-18	
311	10	-90	-18	
312	10	-115	-11	
313	10	-154	-85	
314	10	-61	-11	
315	10	-43	-3	
316	1	-100	8	
317	10	-118	-14	
318	10	-83	-57	
319	10	-104	-20	
320	10	-147	-113	
321	10	-60	-4	
322	10	-100	-16	
323	10	-117	-11	
324	10	-137	-46	
325	10	-115	-100	
326	1	-125	-102	
327	3	-10	-43	
328	10	-125	-87	
329	10	-34	-7	
330	10	-93	-25	
331	10	-62	-14	
332	10	-111	-57	
343	3	-83	-45	
344	1	-123	-35	
345	3	-120	-95	
346	3	-142	-121	
347	3	-116	-53	
348	3	-105	-12	
349	1	-48	-43	
350	10	-136	-85	
351	3	-70	-21	
352	3	-93	-60	
353	10	-147	-138	
354	3	-89	-8	
363	3	-120		
364	1	-113		
365	3	-80	-56	
366	3	-152	-113	
367	10	-98	-63	

-continued

Compound	Dose (mg/kg)	Decrease in systolic blood pressure (mmHg) time after administration (hour)	
		0.5	4
368	3	-110	-68
369	10	-101	-83
370	10	-99	-69
374	3	-119	11
375	1	-126	-70
376	3	-106	-77
377	1	-151	-73
378	1	-106	-90
379	1	-118	-59
380	0.3	-141	
381	3	-136	
382	3	-129	-74
383	3	-112	-86
334	3	-130	-93
385	10	-123	-96
386	10	-83	-96
387	10	-112	-50

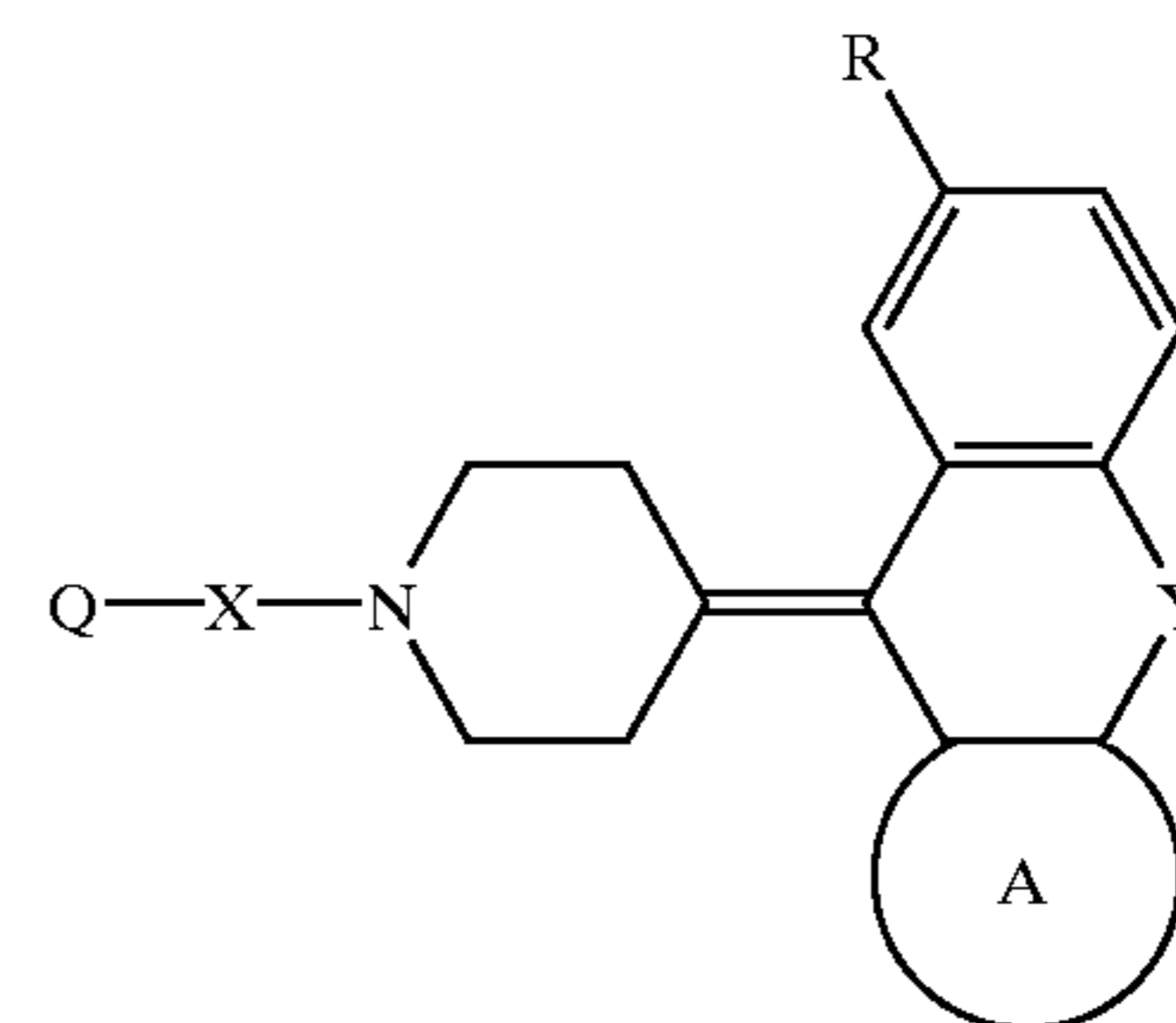
## EFFECTS OF THE INVENTION

25 From the foregoing results, it is understood that the piperidine derivatives of the present invention possess hypotensive activity and are usable as hypotensives and therefore, they can be expected to provide an excellent hypotensive effect. Accordingly, the present invention is  
30 extremely useful, particularly in the pharmaceutical industry.

Having now fully described the invention, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto without departing  
35 from the spirit or scope of the invention as set forth herein.

What is claimed as new and is intended to be secured by Letters Patent of the United States is:

1. A piperidine compound of the formula (I)



wherein:

A is pyridine;

55 R is —H, —Cl or —OCH<sub>3</sub>;

X is —(CH<sub>2</sub>)<sub>n</sub>—, —CO—(CH<sub>2</sub>)<sub>3</sub>—, —CONH—(CH<sub>2</sub>)<sub>2</sub>—, —NHCO—(CH<sub>2</sub>)<sub>2</sub>—, or —CH≡CH—(CH<sub>2</sub>)<sub>2</sub>—; and  
n is an integer of from 3 to 5;

60 Y is —CH≡CH—, —(CH<sub>2</sub>)<sub>2</sub>—, —OCH<sub>2</sub>—, —SCH<sub>2</sub>—, or —O—; and

65 Q is —CN, substituted or unsubstituted cyclohexyl, substituted or unsubstituted piperidinyl, substituted or unsubstituted piperazinyl, substituted or unsubstituted phenyl, substituted or unsubstituted furyl, substituted or unsubstituted thienyl, substituted or unsubstituted pyrrolyl, substituted or unsubstituted pyridyl, substi-



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tuted or unsubstituted morpholinyl, or substituted or unsubstituted thiomorpholinyl, wherein when Q is substituted, the substituent(s) is/are selected from the group consisting of H-(CH<sub>2</sub>)<sub>n</sub> wherein n is an integer of 1 to 10, Cl-(CH<sub>2</sub>)<sub>3</sub>, allyl, phenyl, isopropyl, hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, ethoxycarboxyl, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl) amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl, and wherein when X and/or Q contain -(CH<sub>2</sub>)<sub>n</sub>-groups, one or more of the -(CH<sub>2</sub>)<sub>n</sub>-groups in X and/or Q may be substituted by -(CH<sub>2</sub>)<sub>4</sub> or -(CH<sub>2</sub>)<sub>5</sub>, thereby forming a ring structure.

2. The piperidine compound of claim 1, wherein the hydrogen atoms of one or more of the —CH<sub>2</sub>— groups in X and Q are substituted by -(CH<sub>2</sub>)<sub>4</sub> or -(CH<sub>2</sub>)<sub>5</sub>, thereby forming a ring structure.

3. The piperidine compound of claim 1, wherein Q is substituted by at least one substituent selected from the group consisting of H-(CH<sub>2</sub>)<sub>n</sub> wherein n is an integer of 1 to 10, Cl-(CH<sub>2</sub>)<sub>3</sub>, allyl, phenyl, isopropyl; hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, ethoxycarboxyl, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl)amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl.

4. The piperidine compound of claim 1, wherein X is —CONH—(CH<sub>2</sub>)<sub>2</sub>.

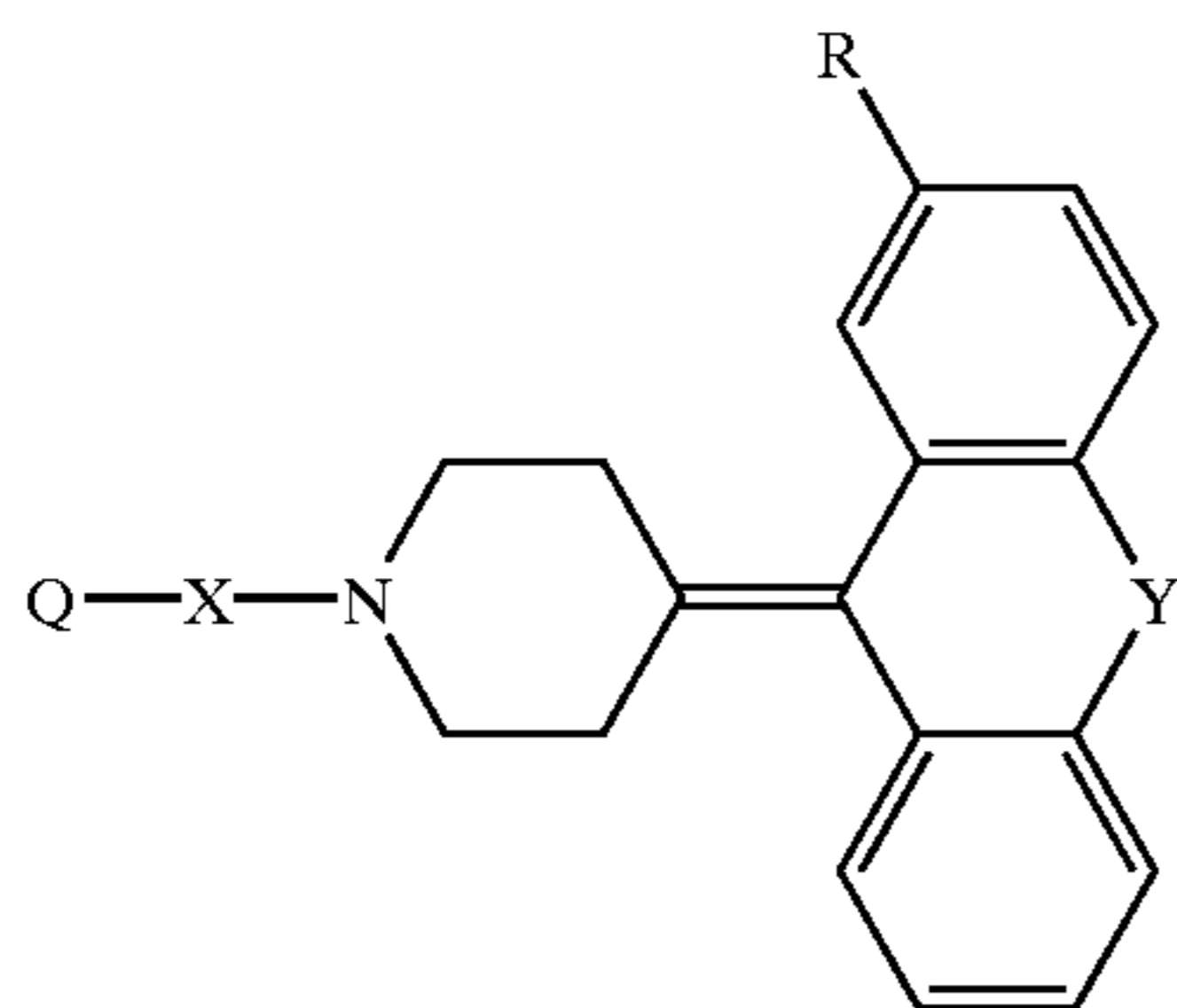
5. The piperidine compound of claim 1, wherein Y is —CH≡CH—.

6. The piperidine compound of claim 1, wherein Y is —(CH<sub>2</sub>)<sub>2</sub>—.

7. The piperidine compound of claim 1, wherein Q is substituted or unsubstituted piperidinyl.

8. The piperidine compound of claim 1, wherein X is —CONH—(CH<sub>2</sub>)<sub>2</sub>, and Q is substituted or unsubstituted piperidinyl.

9. A piperidine compound of the formula



wherein:

R is —H, —Cl or —OCH<sub>3</sub>;

X is —(CH<sub>2</sub>)<sub>n</sub>—, —CO—(CH<sub>2</sub>)<sub>3</sub>, —CONH—(CH<sub>2</sub>)<sub>2</sub>, —NHCO—(CH<sub>2</sub>)<sub>2</sub>, or —CH≡CH—(CH<sub>2</sub>)<sub>2</sub>—; and

n is an integer of from 3 to 5;

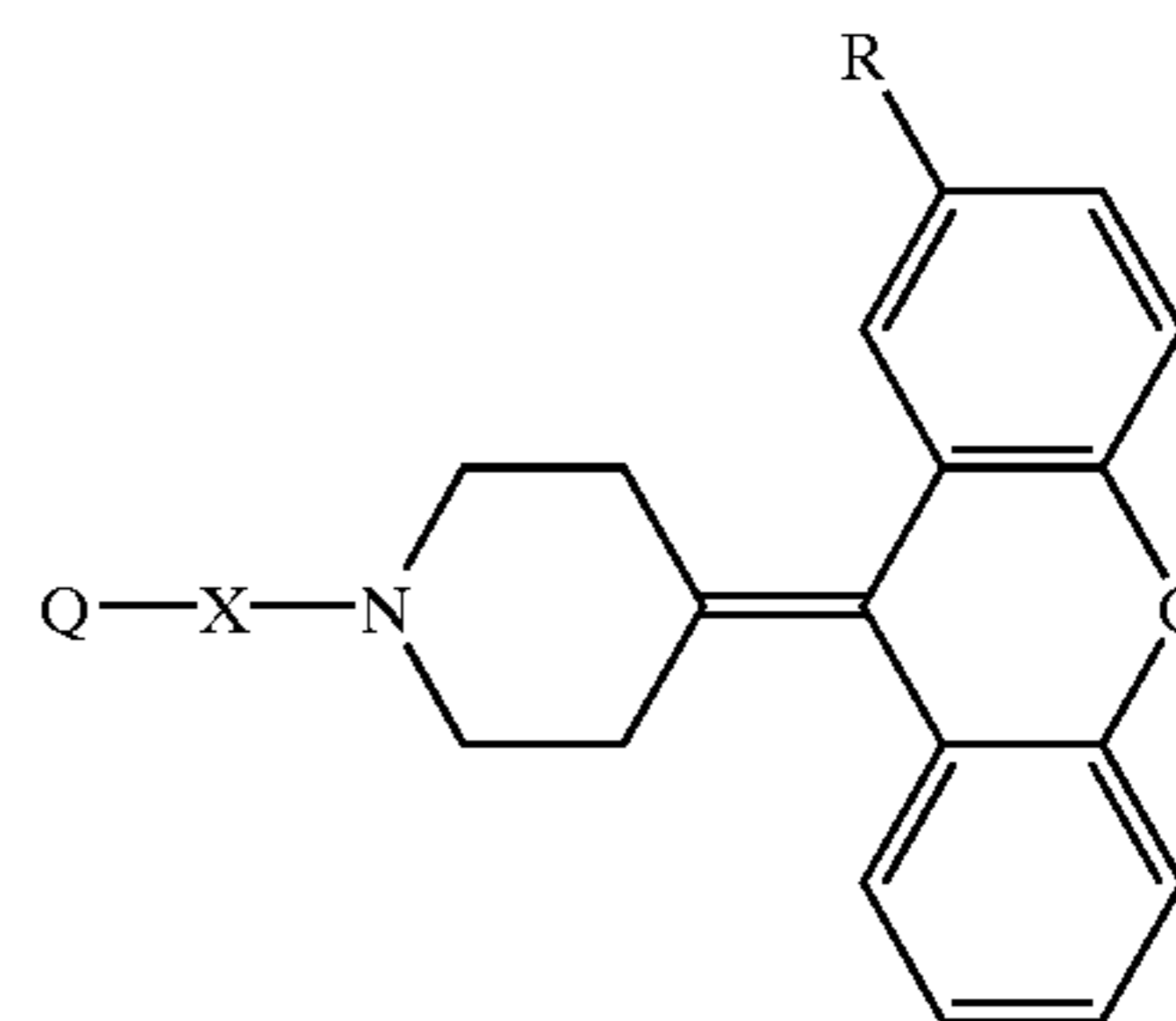
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Y is —CH≡CH—, —(CH<sub>2</sub>)<sub>2</sub>—, —OCH<sub>2</sub>—, —SCH<sub>2</sub>—; and

Q is —CN, substituted or unsubstituted piperidinyl, substituted or unsubstituted piperazinyl, substituted or unsubstituted thienyl, substituted or unsubstituted morpholinyl, or substituted or unsubstituted thiomorpholinyl, wherein when Q is substituted, the substituent(s) is/are selected from the group consisting of H-(CH<sub>2</sub>)<sub>n</sub> wherein n is an integer of 1 to 10, Cl-(CH<sub>2</sub>)<sub>3</sub>, allyl, formyl, phenyl, isopropyl, hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl)amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl, and wherein when X and/or Q contain -(CH<sub>2</sub>)<sub>n</sub>-groups, one or more of the -(CH<sub>2</sub>)<sub>n</sub>-groups in X and/or Q may be substituted by -(CH<sub>2</sub>)<sub>4</sub> or -(CH<sub>2</sub>)<sub>5</sub>, thereby forming a ring structure.

10. The piperidine compound of claim 9, wherein X is —CONH—(CH<sub>2</sub>)<sub>2</sub>, Y is —CH≡CH—, and Q is N-formylpiperidinyl.

11. A piperidine compound of the formula



wherein:

R is —H, —Cl or —OCH<sub>3</sub>;

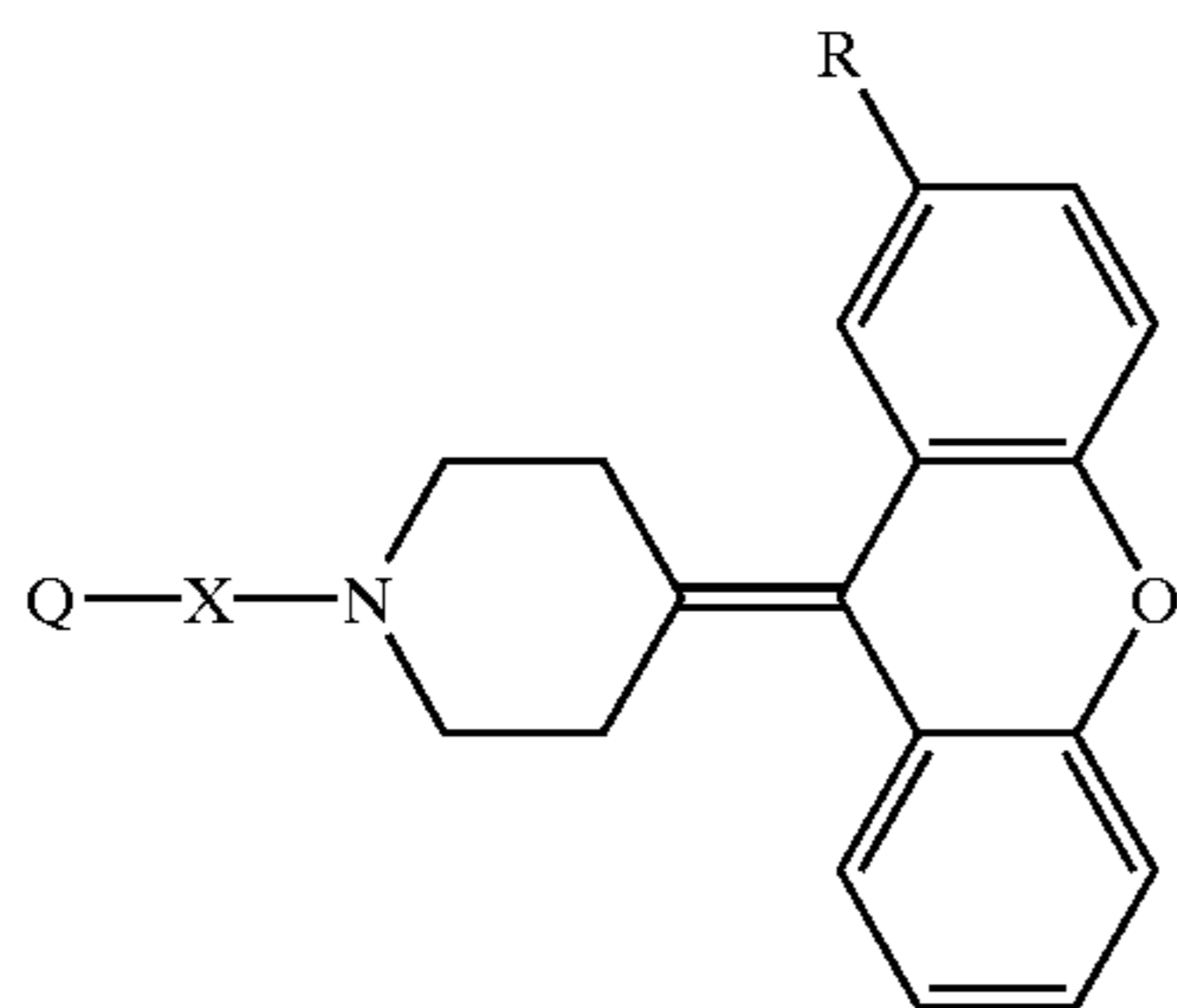
X is —CO—(CH<sub>2</sub>)<sub>3</sub>, —CONH—(CH<sub>2</sub>)<sub>2</sub>, —NHCO—(CH<sub>2</sub>)<sub>2</sub>, or —CH≡CH—(CH<sub>2</sub>)<sub>2</sub>—; and

Q is —CN, substituted or unsubstituted cyclohexyl, substituted or unsubstituted piperidinyl, substituted or unsubstituted piperazinyl, substituted or unsubstituted phenyl, substituted or unsubstituted furyl, substituted or unsubstituted thienyl, substituted or unsubstituted pyrrolyl, substituted or unsubstituted pyridyl, substituted or unsubstituted morpholinyl, or substituted or unsubstituted thiomorpholinyl, wherein when Q is substituted, the substituent(s) is/are selected from the group consisting of H-(CH<sub>2</sub>)<sub>n</sub> wherein n is an integer of 1 to 10, Cl-(CH<sub>2</sub>)<sub>3</sub>, allyl, phenyl, isopropyl, hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, ethoxycarboxyl, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl) amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl, and wherein when X and/or Q

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contain  $-(CH_2)-$  groups, one or more of the  $-(CH_2)-$  groups in X and/or Q may be substituted by  $-(CH_2)_4$  or  $-(CH_2)_5$  thereby forming a ring structure.

12. A piperidine compound of the formula



wherein:

R is  $-H$ ,  $-Cl$  or  $-OCH_3$ ;

X is  $-(CH_2)_n-$ ;

n is an integer of from 3 to 5; and

Q is  $-CN$ , substituted or unsubstituted phenyl, substituted or unsubstituted furyl, substituted or unsubstituted thienyl, substituted or unsubstituted pyrrolyl, sub-

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stituted or unsubstituted pyridyl, wherein when Q is substituted, the substituent(s) is/are selected from the group consisting of  $H-(CH_2)_n$  wherein n is an integer of 1 to 10,  $Cl-(CH_2)_3$ , allyl, phenyl, isopropyl, hydroxy, methoxy, ethoxy, fluoro, chloro, acetoxy, 2-methoxyacetoxy, ethoxycarboxyl, carboxyl, methoxycarbonyl, ethoxycarbonyl, cyano, imidazolylmethyl, trifluoromethyl, benzoyl, 2-hydroxybenzyl, nitro, amino, acetylamino, propanoylamino, butanoylamino, pivaloylamino, trifluoromethylamino, methoxycarbonylamino, ethoxycarbonylamino, cinnamoylamino, methanesulfonylamino, N,N-bis(methanesulfonyl) amino, aminocarbonyl, aminosulfonyl, hydroxymethyl and acetoxymethyl, and wherein one or more of the  $-(CH_2)-$  groups in X may be substituted by  $-(CH_2)_4$  or  $-(CH_2)_5$  thereby forming a ring structure.

13. The piperidine compounds of claim 10, wherein R is  $-H$ .

\* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : RE 38,257 E  
DATED : September 23, 2003  
INVENTOR(S) : Shoji et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page, Item [54] and Column 1, line 1,  
The Title should read

**-- PIPERIDINE DERIVATIVES AND HYPOTENSIVES CONTAINING  
THE SAME --**

Signed and Sealed this

Eighteenth Day of November, 2003

A handwritten signature in black ink, appearing to read "James E. Rogan", with a horizontal line drawn underneath it.

JAMES E. ROGAN  
*Director of the United States Patent and Trademark Office*