(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 November 2007 (29.11.2007)

PCT

(10) International Publication Number
WO 2007/134964 A1

(51) International Patent Classification:
A61K 31/075 (2006.01) *A61K 31/435* (2006.01)
A61K 31/17 (2006.01) *A61K 31/56* (2006.01)
A61K 31/18 (2006.01) *A61P 11/06* (2006.01)

(21) International Application Number:
PCT/EP2007/054487

(22) International Filing Date: 9 May 2007 (09.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
06114541.3 24 May 2006 (24.05.2006) EP
06115462.1 14 June 2006 (14.06.2006) EP

(71) Applicant *(for all designated States except DE, US)*: **BOEHRINGER INGELHEIM INTERNATIONAL GMBH** [DE/DE]; Binger Strasse 173, 55216 Ingelheim Am Rhein (DE).

(71) Applicant *(for DE only)*: **BOEHRINGER INGELHEIM PHARMA GMBH & CO. KG** [DE/DE]; Binger Strasse 173, 55216 Ingelheim Am Rhein (DE).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **KONETZKI, Ingo** [DE/DE]; Muellerweg 9, 88447 Warthausen (DE).

(74) Agents: **HAMMANN, Heinz** et al.; Boehringer Ingelheim GmbH, Binger Strasse 173, 55216 Ingelheim Am Rhein (DE).

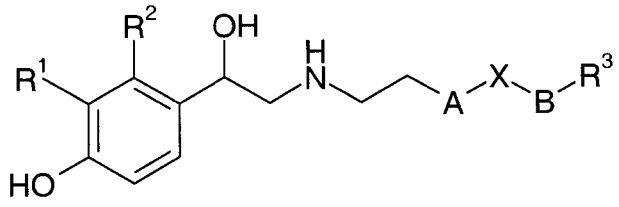
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** NOVEL MEDICAMENT COMBINATIONS FOR THE TREATMENT OF RESPIRATORY DISEASES



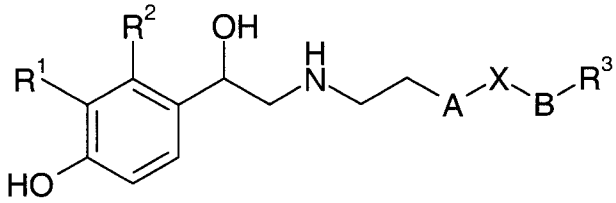
1

(57) **Abstract:** The present invention relates to new medicament combinations which contain in addition to one or more, preferably one, compound of general formula 1 wherein the groups A, B, X, R^1, R^2 and R^3 may have the meanings given in the claims and specification, at least one anticholinergic 2 and at least one steroid 3, processes for preparing them and their use as pharmaceutical compositions.

WO 2007/134964 A1

NOVEL MEDICAMENT COMBINATIONS FOR THE TREATMENT OF RESPIRATORY DISEASES

The present invention relates to new medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1**

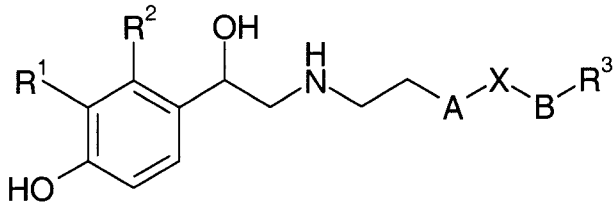


1

wherein the groups A, B, X, R^1, R^2 and R^3 may have the meanings given in the claims and specification, at least one anticholinergic **2** and at least one steroid **3**, processes for preparing them and their use as pharmaceutical compositions.

Detailed description of the invention

The present invention relates to medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1**



1

wherein

A	denotes phenylen or -C_1-C_5-alkylen;
B	denotes a group selected from a single bond, phenylen, -C_1-C_5-alkylen and -C_1-C_3-alkylen-O-C_1-C_3-alkylen which is optionally substituted by OH or -O-C_1-C_4-alkyl;
X	denotes -NH- or -O-;
R^1	denotes -CH_2-OH, or -NH-CHO;
R^2	denotes hydrogen, or
R^1 and R^2	together -NH-CO-CH=CH-
R^3	denotes phenyl which is optionally substituted by one or two groups selected from among -C_1-C_4-alkyl, halogen, -O-C_1-C_4-alkyl, -O-C_1-C_4-alkylene-NH_2, -SO_2NH_2, -NH-CO-NH_2, -SO_2-C_1-C_5-alkyl and -SO_2-C_3-C_6-cycloalkyl,

at least one anticholinergic **2** and at least one steroid **3**.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1**, wherein

A denotes phenylen, $-CH_2-CH_2-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-CH_2-CH_2-$;

B denotes a group selected from a single bond, phenylen, $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-CH_2-$ and $-CH_2-CH_2-O-CH_2-$ which is optionally substituted by OH or $-O-CH_3$;

X denotes -NH- or -O-;

R^1 denotes $-CH_2-OH$, or -NH-CHO;

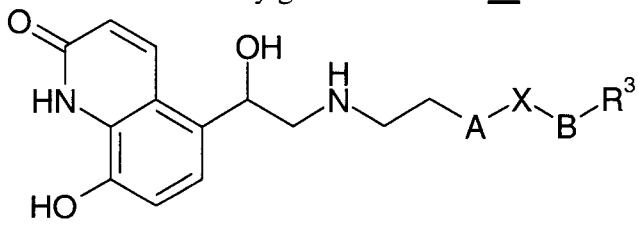
R^2 denotes hydrogen, or

R^1 and R^2 together denote -NH-CO-CH=CH-

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-O-CH_2-C(CH_3)_2-NH_2$, $-SO_2NH_2$, -NH-CO-NH_2 and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3**.

Preferred medicament combinations contain one or more, preferably one, compound of general formula **1**, wherein R^1 and R^2 together denote -NH-CO-CH=CH-. This preferred group of compounds is characterized by general formula **1a**



1a.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1a**, wherein

A denotes phenylen or $-CH_2-CH_2-CH_2-CH_2-$;

B denotes a group selected from a single bond, phenylen and $-CH_2-CH_2-$, which is optionally substituted by $-O-CH_3$;

X denotes -NH- and O;

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-O-CH_2-C(CH_3)_2-NH_2$, $-SO_2NH_2$, $-NH-CO-NH_2$ and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3**.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1a**, wherein

A denotes phenylen or $-CH_2-CH_2-CH_2-CH_2-$;

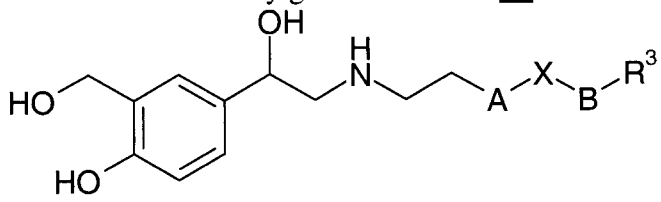
B denotes a group selected from a single bond, phenylen, $-CH_2-CH_2-$ or phenylen substituted by $-O-CH_3$;

X denotes -NH-;

R^3 denotes phenyl which is optionally substituted by $-O-CH_2-C(CH_3)_2-NH_2$;

at least one anticholinergic **2** and at least one steroid **3**.

Also preferred medicament combinations contain one or more, preferably one, compound of general formula **1**, wherein R^1 denotes $-CH_2-OH$ and R^2 is hydrogen. This preferred group of compounds is characterized by general formula **1b**



1b.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1b**, wherein

A denotes $-CH_2-CH_2-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-CH_2-CH_2-$;

B denotes a group selected from $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-CH_2-$ and $-CH_2-CH_2-O-CH_2-$ which is optionally substituted by OH or $-O-CH_3$;

X denotes -NH- or -O-;

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-O-CH_2-C(CH_3)_2-NH_2$, $-SO_2NH_2$, $-NH-CO-NH_2$ and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3**.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1b**, wherein

A denotes $-CH_2-CH_2-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-CH_2-CH_2-$;

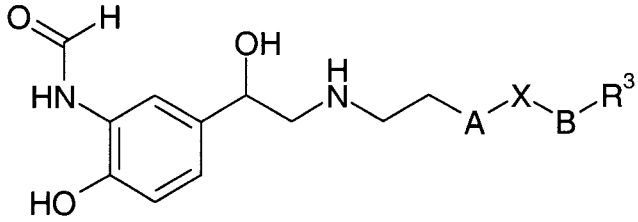
B denotes $-CH_2-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-CH_2-$ or $-CH_2-CH_2-O-CH_2-$;

X denotes -O-;

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-SO_2NH_2$, $-NH-CO-NH_2$ and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3**.

Also preferred medicament combinations contain one or more, preferably one, compound of general formula **1**, wherein R^1 denotes -NH-CHO and R^2 is hydrogen. This preferred group of compounds is characterized by general formula **1c**



1c.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1c**, wherein

A denotes phenylen, $-CH_2-CH_2-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-CH_2-CH_2-$;

B denotes a group selected from phenylen, $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, and $-CH_2-CH_2-CH_2-CH_2-$, which is optionally substituted by OH or $-O-CH_3$;

X denotes -NH- or -O-;

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-O-CH_2-C(CH_3)_2-NH_2$, $-SO_2NH_2$, $-NH-CO-NH_2$ and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3**.

Preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1c**, wherein

A denotes phenylen;

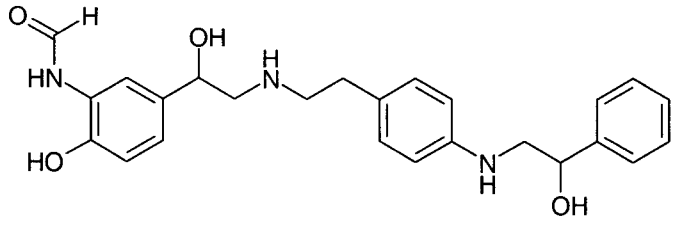
B denotes a group selected from $-CH_2-CH_2-$ and $-CH_2-CH_2-CH_2-$, which is optionally substituted by OH;

X denotes -NH-;

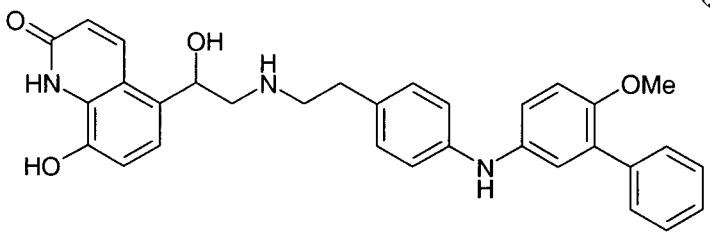
R^3 denotes phenyl;

at least one anticholinergic **2** and at least one steroid **3**.

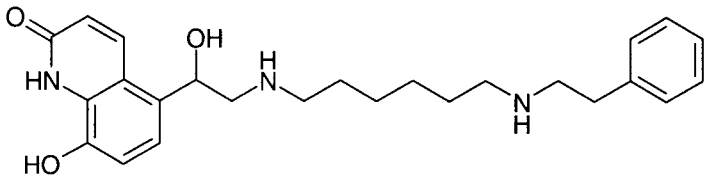
Also particularly preferred are medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1** selected from the group consisting of



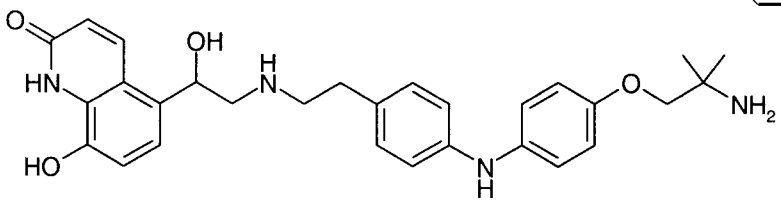
(**1.1**),



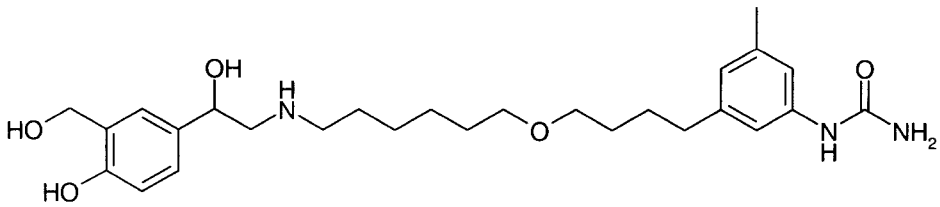
(**1.2**),



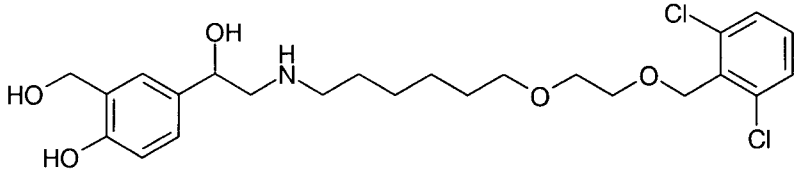
(**1.3**),



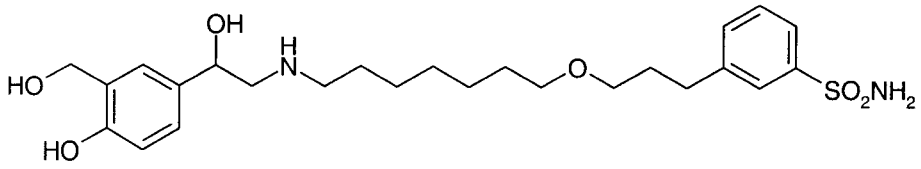
(**1.4**),



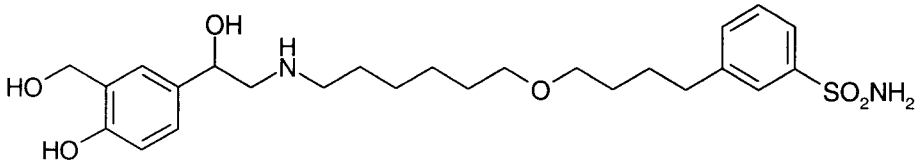
(**1.5**),



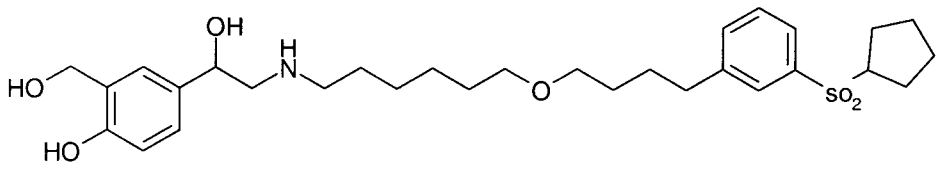
(**1.6**),



(1.7),



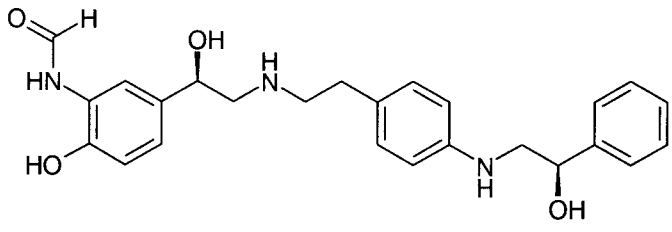
(1.8), and



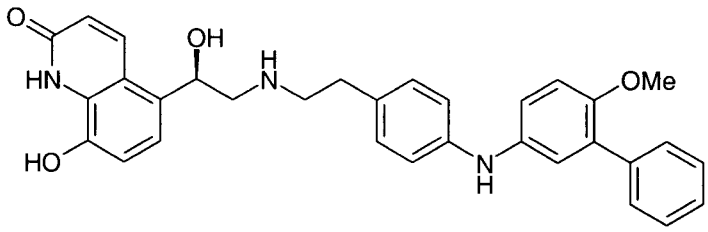
(1.9),

at least one anticholinergic 2 and at least one steroid 3.

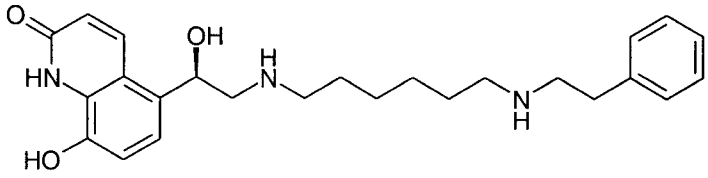
In the medicament combinations according to the invention the compounds of formula 1 may be present in the form of the individual optical isomers, mixtures of the individual enantiomers or racemates. Particularly preferred are those medicament combinations wherein one or more, preferably one compound of formula 1 is in the form of the enantiomerically pure compounds, preferably in the form of the R-enantiomers outlined below:



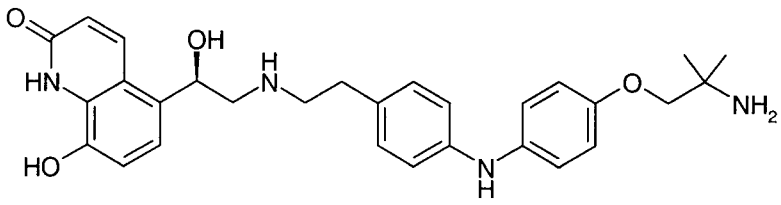
(1.1),



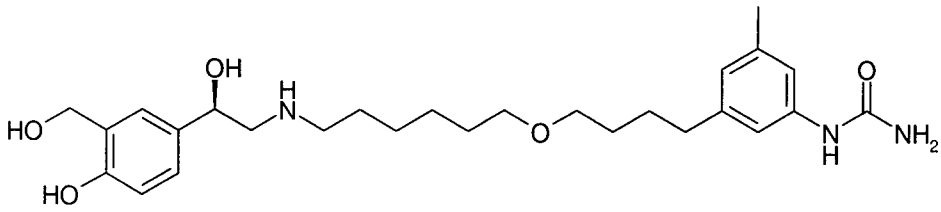
(1.2),



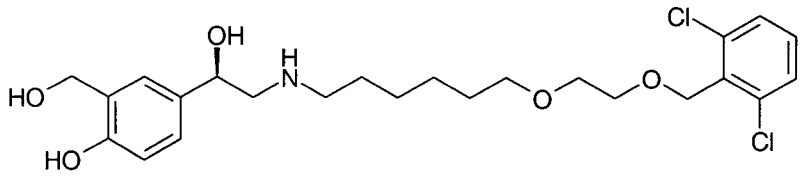
(1.3),



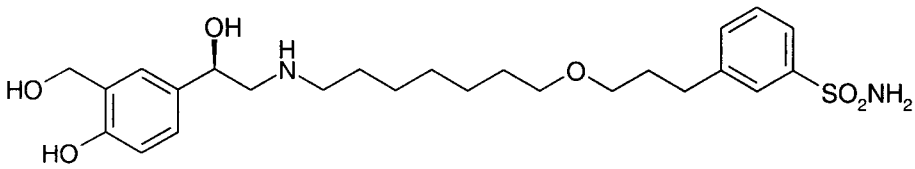
(1.4),



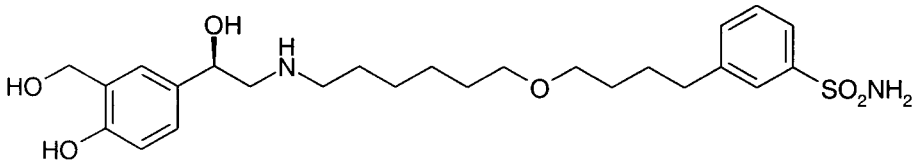
(1.5),



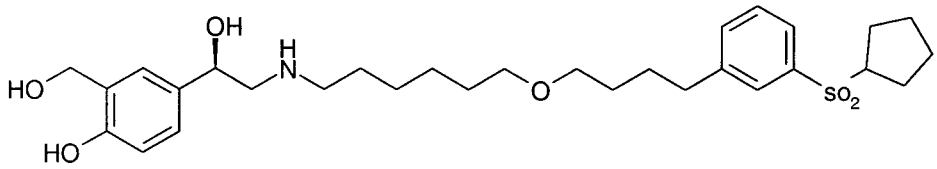
(1.6),



(1.7),



(1.8), and



(1.9),

Methods of separating racemates into the various enantiomers are known in the art and may be used to prepare the enantiomerically pure R- or S-enantiomers of the compounds of formula 1 analogously.

In another aspect the present invention relates to medicament combinations which contain the above-mentioned compounds of formula 1 in the form of the acid addition salts with pharmacologically acceptable acids as well as optionally in the form of the solvates and/or hydrates.

By acid addition salts with pharmacologically acceptable acids are meant for example salts selected from the group comprising the hydrochloride, hydrobromide, hydroiodide, hydrosulphate, hydrophosphate, hydromethanesulphonate, hydronitrate, hydromaleate, hydroacetate, hydrobenzoate, hydrocitrate, hydrofumarate, hydrotartrate, hydrooxalate, hydrosuccinate, hydrobenzoate and hydro-*p*-toluenesulphonate, preferably the hydrochloride, hydrobromide, hydrosulphate, hydrophosphate, hydrofumarate and hydromethanesulphonate. Of the above-mentioned acid addition salts, the salts of hydrochloric acid, methanesulphonic acid, benzoic acid and acetic acid are particularly preferred according to the invention.

Preferred medicament combinations contain in addition to one or more, preferably one compound of formula **1** as an additional active substance one or more, preferably one anticholinergic **2**, in addition to one or more, preferably one steroid **3**, optionally in combination with pharmaceutically acceptable excipients.

In the medicament combinations according to the invention the anticholinergic **2** is preferably selected from among the tiotropium salts (**2.1**), oxitropium salts (**2.2**), flutropium salts (**2.3**), ipratropium salts (**2.4**), glycopyrronium salts (**2.5**), trospium salts (**2.6**) and the compounds of formulae **2.7** to **2.13**.

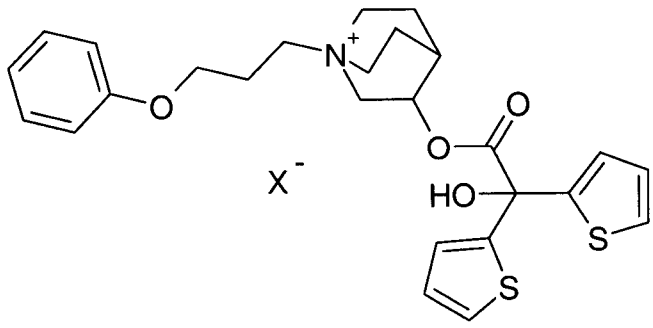
In the above-mentioned salts **2.1** to **2.6** the cations tiotropium, oxitropium, flutropium, ipratropium, glycopyrronium and trospium are the pharmacologically active constituents. Explicit references to the above-mentioned cations are indicated by the numerals **2.1'** to **2.6'**. Each reference to the above-mentioned salts **2.1** to **2.6** naturally includes a reference to the corresponding cations tiotropium (**2.1'**), oxitropium (**2.2'**), flutropium (**2.3'**), ipratropium (**2.4'**), glycopyrronium (**2.5'**) and trospium (**2.6'**).

By the salts **2.1** to **2.6** are meant according to the invention those compounds which contain in addition to the cations tiotropium (**2.1'**), oxitropium (**2.2'**), flutropium (**2.3'**), ipratropium (**2.4'**), glycopyrronium (**2.5'**) and trospium (**2.6'**) as counter-ion (anion) chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate or p-toluenesulphonate contain, while the chloride, bromide, iodide, sulphate, methanesulphonate or p-toluenesulphonate are preferred as counter-ions. Of all the salts the chloride, bromide, iodide and methanesulphonate are particularly preferred.

In the case of the trospium salts (**2.6**) the chloride is particularly preferred. Of the other salts **2.1** to **2.5** the methanesulphonates and bromides are of particular importance.
Of particular importance are medicament combinations which contain tiotropium salts (**2.1**), oxitropium salts (**2.2**) or ipratropium salts (**2.4**), while the respective bromides are particularly important according to the invention. Of particular importance is the tiotropium bromide (**2.1**). The above-mentioned salts may optionally be present in the medicament combinations according to the invention in the form of their solvates or hydrates, preferably in the form of their hydrates. In the case of tiotropium bromide the medicament combinations according to the invention preferably contain this in the form of the crystalline tiotropium bromide monohydrate, which is known from WO 02/30928. If the tiotropium bromide is used in anhydrous form in the medicament combinations according to the invention, it is preferable to use the anhydrous crystalline tiotropium bromide which is known from WO 03/000265.

The above-mentioned anticholinergics optionally have chiral carbon centres. In this case the medicament combinations according to the invention may contain the anticholinergics in the form of their enantiomers, mixtures of enantiomers or racemates, while enantiomerically pure anticholinergics are preferably used .

In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the salts of formula **2.7**



2.7

wherein

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

optionally in the form of the racemates, enantiomers or hydrates thereof.

Preferred medicament combinations contain salts of formula **2.7**, wherein

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, methanesulphonate and p-toluenesulphonate, preferably bromide,

optionally in the form of the racemates, enantiomers or hydrates thereof.

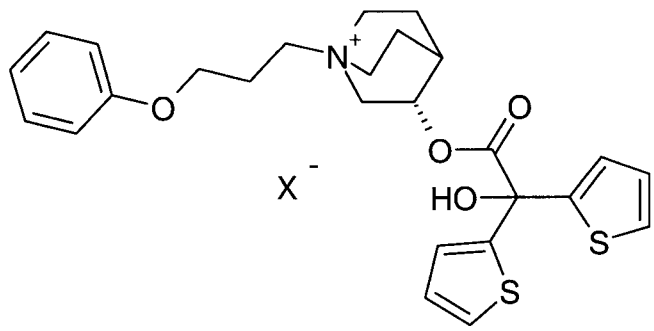
Preferred medicament combinations contain salts of formula **2.7**, wherein

X^- denotes an anion with a single negative charge, preferably an anion selected from among the chloride, bromide and methanesulphonate, preferably bromide,

optionally in the form of the racemates, enantiomers or hydrates thereof.

Particularly preferred medicament combinations contain the compound of formula **2.7** in the form of the bromide.

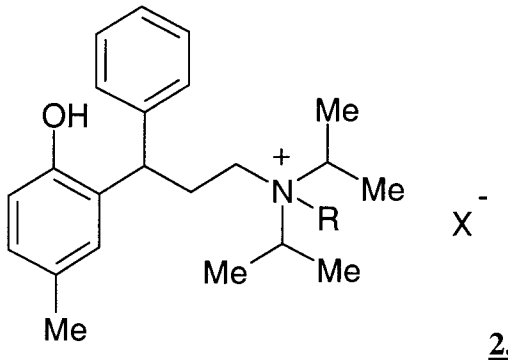
Of particular importance are those medicament combinations which contain the enantiomers of formula **2.7-en**



2.7-en

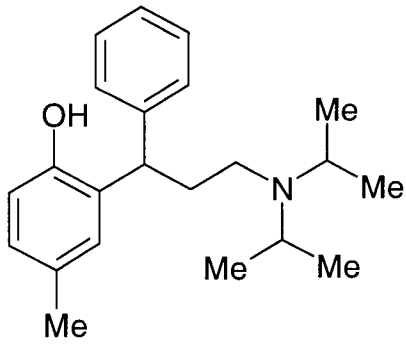
wherein X^- may have the above-mentioned meanings.

In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the salts of formula **2.8**



2.8

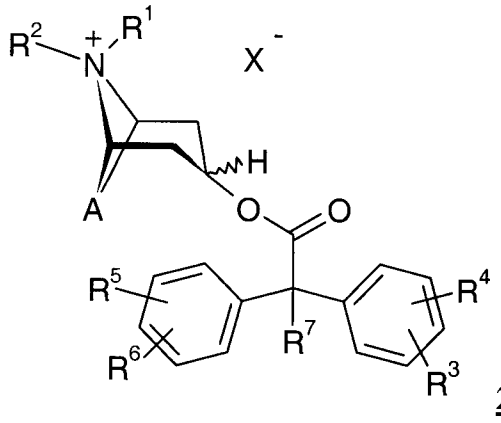
wherein R denotes either methyl (**2.8.1**) or ethyl (**2.8.2**) and wherein X^- may have the above-mentioned meanings. In an alternative embodiment the compound of formula **2.8** is present in the form of the free base **2.8-base**



2.8-base

The medicament combinations according to the invention may contain the anticholinergic of formula **2.8** (or **2.8-base**) in the form of the enantiomers, mixtures of enantiomers or racemates thereof . Preferably the anticholinergics of formula **2.8** (or **2.8-base**) are present in the form of their R-enantiomers.

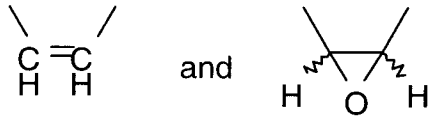
In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the compounds of formula **2.9**



2.9

wherein

A denotes a double-bonded group selected from the groups



X^- denotes one of the above-mentioned anions with a single negative charge, preferably chloride, bromide or methanesulphonate, particularly preferred bromide;

R^1 and R^2 which may be identical or different, denote methyl or ethyl, preferably methyl;

R^3, R^4, R^5 and R^6, which may be identical or different, denote hydrogen, methyl, methyloxy, chlorine or fluorine;

R^7 denotes hydrogen, methyl or fluorine.

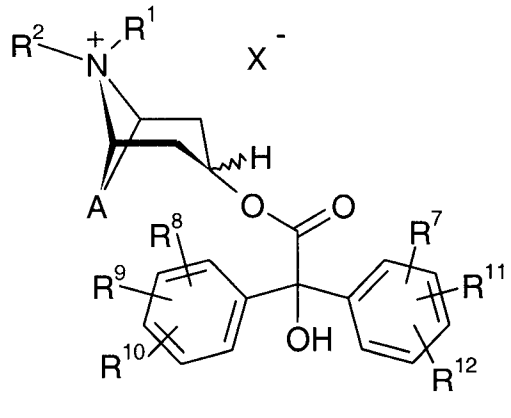
The compounds of formula **2.9** are known in the art (WO 02/32899).

Of particular importance are those medicament combinations which contain in addition to a compound of formula **1** one of the following compounds of formula **2.9** :

- tropenol 2,2-diphenylpropionate methobromide (**2.9.1**),
- scopine 2,2-diphenylpropionate methobromide (**2.9.2**),
- scopine 2-fluoro-2,2-diphenylacetate methobromide (**2.9.3**),
- tropenol 2-fluoro-2,2-diphenylacetate methobromide (**2.9.4**),;

The compounds of formula **2.9** may optionally in the form of the enantiomers, mixtures of enantiomers or racemates thereof, as well as optionally in the form of the hydrates and/or solvates thereof.

In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the compounds of formula **2.10**



2.10

wherein

A, X^-, R^1 and R^2 may have the meanings given above and wherein

R^7, R^8, R^9, R^{10}, R^{11} and R^{12}, which may be identical or different, denote hydrogen, fluorine, chlorine or bromine, preferably fluorine, while at least one of the groups R^7, R^8, R^9, R^{10}, R^{11} and R^{12} may not be hydrogen.

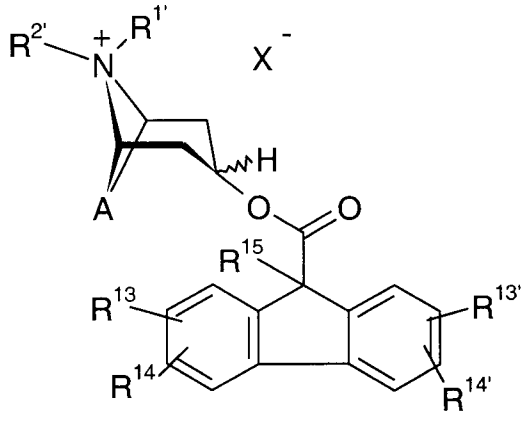
The compounds of formula **2.10** are known in the art (WO 02/32898).

Of particular importance are those medicament combinations which contain in addition to a compound of formula **1** one of the following compounds of formula **2.10** :

- tropenol 3,3',4,4'-tetrafluorobenzilate methobromide (**2.10.1**),
- scopine 3,3',4,4'-tetrafluorobenzilate methobromide (**2.10.2**),
- tropenol 4,4'-difluorobenzilate methobromide (**2.10.3**),
- scopine 4,4'-difluorobenzilate methobromide (**2.10.4**),
- tropenol 3,3'-difluorobenzilate methobromide (**2.10.5**),
- scopine 3,3'-difluorobenzilate methobromide (**2.10.6**).

The compounds of formula **2.10** may optionally be present in the form of the enantiomers, mixtures of enantiomers or racemates thereof, as well as optionally in the form of the hydrates and/or solvates thereof .

In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the compounds of formula **2.11**



2.11

wherein

A and X^- may have the meanings given above and wherein

R^{15} denotes hydroxy or methyl, preferably methyl;

$R^{1'}$ and $R^{2'}$ which may be identical or different, denote methyl or ethyl, preferably methyl;

R^{13}, R^{14}, $R^{13'}$ and $R^{14'}$ which may be identical or different, denote hydrogen or fluorine.

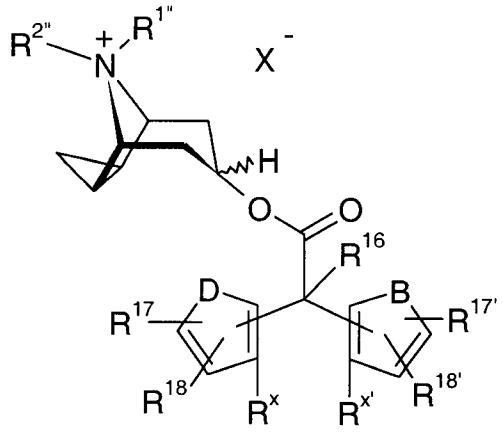
The compounds of formula **2.11** are known in the art (WO 03/064419).

Of particular importance are those medicament combinations which contain in addition to a compound of formula **1** one of the following compounds of formula **2.11** :

- tropenol 9-hydroxy-fluorene-9-carboxylate methobromide (**2.11.1**);
- tropenol 9-fluoro-fluorene-9-carboxylate methobromide (**2.11.2**) ;
- scopine 9-hydroxy-fluorene-9-carboxylate methobromide (**2.11.3**) ;
- scopine 9-fluoro-fluorene-9-carboxylate methobromide (**2.11.4**) ;
- tropenol 9-methyl-fluorene-9-carboxylate methobromide (**2.11.5**) ;
- scopine 9-methyl-fluorene-9-carboxylate methobromide (**2.11.6**) ;

The compounds of formula **2.11** may optionally be present in the form of the enantiomers, mixtures of enantiomers or racemates thereof, as well as optionally in the form of the hydrates and/or solvates thereof .

In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the compounds of formula **2.12**



2.12

wherein X^- may have the meanings given above and wherein

D and B which may be identical or different, preferably identical, denote S or CH=CH;

R^{16} denotes hydrogen, hydroxy or methyl;

$R^{1''}$ and $R^{2''}$ which may be identical or different, denote methyl or ethyl;

R^{17}, R^{18}, $R^{17'}$ and $R^{18'}$, which may be identical or different, denote hydrogen, $-CF_3$ or fluorine, preferably hydrogen;

R^X and $R^{X'}$ which may be identical or different, denote hydrogen, $-CF_3$ or fluorine, preferably hydrogen, or

R^X and $R^{X'}$ together denote a single bond or -O.

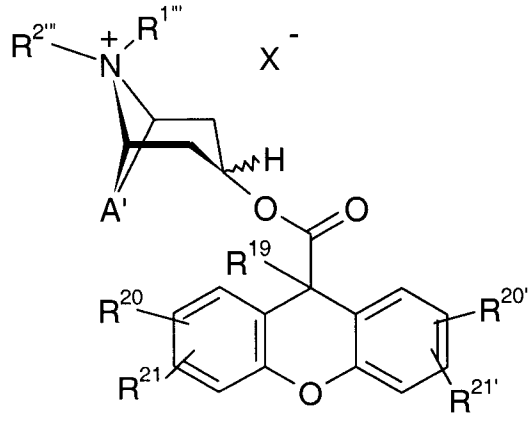
The compounds of formula **2.12** are known in the art (WO 03/064418).

Of particular importance are those medicament combinations which contain in addition to a compound of formula **1** one of the following compounds of formula **2.12** :

- cyclopropyltropine benzilate methobromide (**2.12.1**);
- cyclopropyltropine 2,2-diphenylpropionate methobromide (**2.12.2**);
- cyclopropyltropine 9-hydroxy-xanthene-9-carboxylate methobromide (**2.12.3**);
- cyclopropyltropine 9-methyl-fluorene-9-carboxylate methobromide (**2.12.4**);
- cyclopropyltropine 9-methyl-xanthene-9-carboxylate methobromide (**2.12.5**);
- cyclopropyltropine 9-hydroxy-fluorene-9-carboxylate methobromide (**2.12.6**);
- cyclopropyltropine methyl 4,4'-difluorobenzilate methobromide (**2.12.7**).

The compounds of formula **2.12** may optionally be present in the form of the enantiomers, mixtures of enantiomers or racemates thereof, as well as optionally in the form of the hydrates and/or solvates thereof .

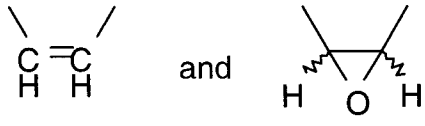
In another preferred embodiment of the present invention the anticholinergics **2** contained in the medicament combinations according to the invention are selected from the compounds of formula **2.13**



2.13

wherein X^- may have the meanings given above and wherein

A' denotes a double-bonded group selected from



;

R^{19} denotes hydroxy or methyl, preferably methyl;

$R^{1'''}$ and $R^{2'''}$ which may be identical or different, denote methyl or ethyl, preferably methyl;

R^{20}, R^{21}, $R^{20'}$ and $R^{21'}$ which may be identical or different, denote hydrogen or fluorine.

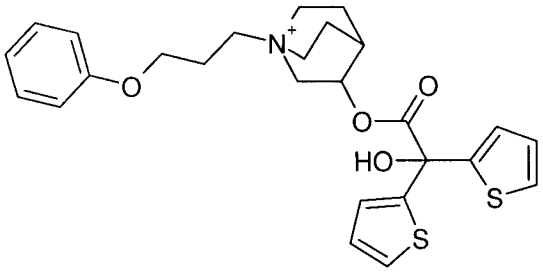
The compounds of formula **2.13** are known in the art (WO 03/064417).

Of particular importance are those medicament combinations which contain in addition to a compound of formula **1** one of the following compounds of formula **2.13** :

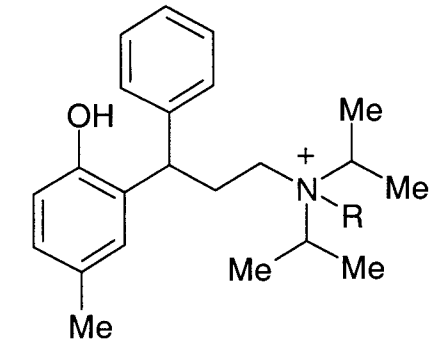
- tropenol 9-hydroxy-xanthene-9-carboxylate methobromide (**2.13.1**);
- scopine 9-hydroxy-xanthene-9-carboxylate methobromide (**2.13.2**);
- tropenol 9-methyl-xanthene-9-carboxylate methobromide (**2.13.3**);
- scopine 9-methyl-xanthene-9-carboxylate methobromide (**2.13.4**);
- tropenol 9-ethyl-xanthene-9-carboxylate methobromide (**2.13.5**);
- tropenol 9-difluoromethyl-xanthene-9-carboxylate methobromide (**2.13.6**);
- scopine 9-hydroxymethyl-xanthene-9-carboxylate methobromide (**2.13.7**).

The compounds of formula **2.13** may optionally be present in the form of the enantiomers, mixtures of enantiomers or racemates thereof, as well as optionally in the form of the hydrates and/or solvates thereof .

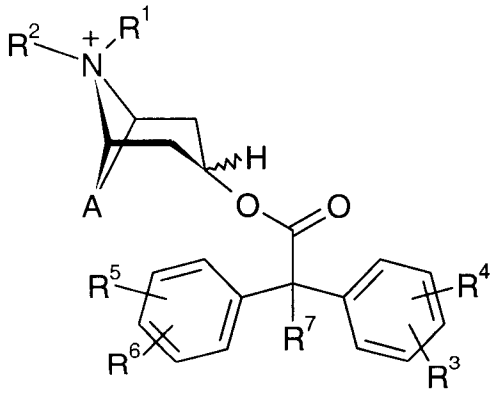
Within the scope of the present invention any reference to anticholinergics **2'** is to be taken as a reference to the pharmacologically active cations of the various salts . These cations are tiotropium (**2.1'**), oxitropium (**2.2'**), flutropium (**2.3'**), ipratropium (**2.4'**), glycopyrronium (**2.5'**), trospium (**2.6'**) and the cations shown below:



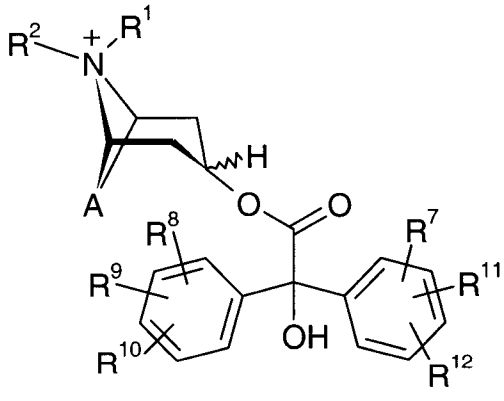
2.7';



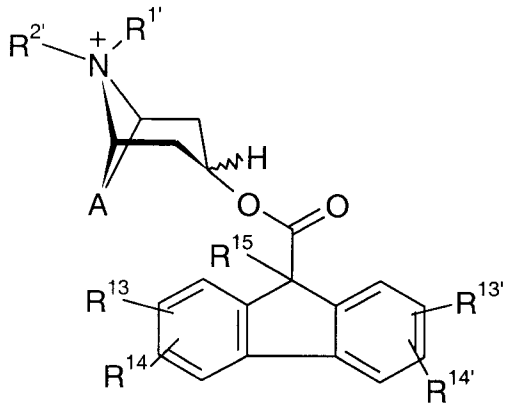
2.8';



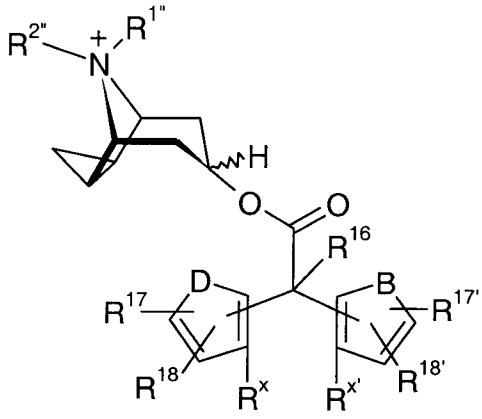
2.9';



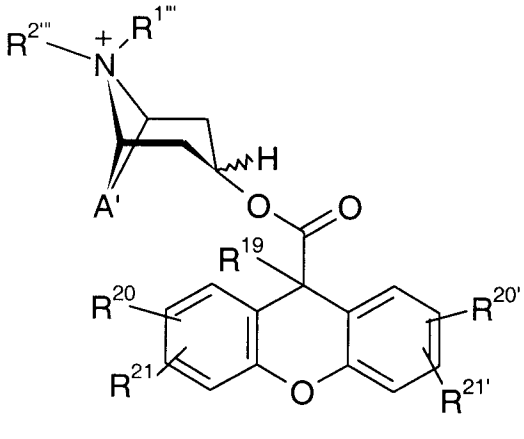
2.10'



2.11';



2.12';



or 2.13'.

In the medicament combinations according to the invention the steroid 3 is preferably selected from among prednisolone (3.1), prednisone (3.2), butixocortpropionate (3.3), RPR-106541 (3.4), flunisolide (3.5), beclomethasone (3.6), triamcinolone (3.7), budesonide (3.8), fluticasone (3.9), mometasone (3.10), ciclesonide (3.11), rofleponide (3.12), ST-126 (3.13), dexamethasone (3.14), (S)-fluoromethyl 6α,9α-difluoro-17α-[(2-furanylcarbonyl)oxy]-11β-hydroxy-16α-methyl-3-oxo-androsta-1,4-diene-17β-carbothionate (3.15), (S)-(2-oxo-tetrahydro-furan-3S-yl)6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-propionyloxy-androsta-1,4-diene-17β-carbothionate (3.16), etiprednol-dichloroacetate (BNP-166, 3.17), 6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-(2,2,3,3-tertamethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17β-carboxylic acid cyanomethyl ester (3.18), optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the salts and derivatives thereof, the solvates and/or hydrates thereof.

In particularly preferred medicament combinations the steroid **3** is selected from the group comprising flunisolide (**3.5**), beclomethasone (**3.6**), triamcinolone (**3.7**), budesonide (**3.8**), fluticasone (**3.9**), mometasone (**3.10**), ciclesonide (**3.11**), rofleponide (**3.12**), ST-126 (**3.13**), dexamethasone (**3.14**), (S)-fluoromethyl 6α,9α-difluoro-17α-[(2-furanylcarbonyl)oxy]-11β-hydroxy-16α-methyl-3-oxo-androsta-1,4-diene-17β-carbothionate (**3.15**), (S)-(2-oxo-tetrahydro-furan-3S-yl)6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-propionyloxy-androsta-1,4-diene-17β-carbothionate (**3.16**), etiprednol-dichloroacetate (**3.17**) and 6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-(2,2,3,3-tertamethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17β-carboxylic acid cyanomethyl ester (**3.18**), optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the salts and derivatives thereof, the solvates and/or hydrates thereof.

In particularly preferred medicament combinations the steroid **3** is selected from the group comprising budesonide (**3.8**), fluticasone (**3.9**), mometasone (**3.10**), ciclesonide (**3.11**), (S)-fluoromethyl 6α,9α-difluoro-17α-[(2-furanylcarbonyl)oxy]-11β-hydroxy-16α-methyl-3-oxo-androsta-1,4-diene-17β-carbothionate (**3.15**), etiprednol-dichloroacetate (**3.17**) and 6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-(2,2,3,3-tertamethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17β-carboxylic acid cyanomethyl ester (**3.18**), optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the salts and derivatives thereof, the solvates and/or hydrates thereof.

Any reference to steroids **3** includes a reference to any salts or derivatives, hydrates or solvates thereof which may exist. Examples of possible salts and derivatives of the steroids **3** may be: alkali metal salts, such as for example sodium or potassium salts, sulphobenzoates, phosphates, isonicotinates, acetates, propionates, dihydrogen phosphates, palmitates, pivalates or furoates.

Examples of particularly preferred medicament combinations according to the invention contain as the betamimetic compound **1.1**, or a pharmacologically acceptable acid addition salt thereof and in addition **2.1** and **3.8**; **2.1** and **3.9**; **2.1** and **3.10**; **2.1** and **3.11**; **2.1** and **3.12**; **2.1** and **3.13**; **2.1** and **3.14**; **2.1** and **3.15**; **2.1** and **3.16**; **2.1** and **3.17**; **2.1** and **3.18**; **2.2** and **3.8**; **2.2** and **3.9**; **2.2** and **3.10**; **2.2** and **3.11**; **2.2** and **3.12**; **2.2** and **3.13**; **2.2** and **3.14**; **2.2** and **3.15**; **2.2** and **3.16**; **2.2** and **3.17**; **2.2** and **3.18**; **2.3** and **3.8**; **2.3** and **3.9**; **2.3** and

3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.2, or a pharmacologically acceptable acid addition

salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates,

enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound **1.3**, or a pharmacologically acceptable acid addition salt thereof and in addition **2.1** and **3.8**; **2.1** and **3.9**; **2.1** and **3.10**; **2.1** and **3.11**; **2.1** and **3.12**; **2.1** and **3.13**; **2.1** and **3.14**; **2.1** and **3.15**; **2.1** and **3.16**; **2.1** and **3.17**; **2.1** and **3.18**; **2.2** and **3.8**; **2.2** and **3.9**; **2.2** and **3.10**; **2.2** and **3.11**; **2.2** and **3.12**; **2.2** and **3.13**; **2.2** and **3.14**; **2.2** and **3.15**; **2.2** and **3.16**; **2.2** and **3.17**; **2.2** and **3.18**; **2.3** and **3.8**; **2.3** and **3.9**; **2.3** and **3.10**; **2.3** and **3.11**; **2.3** and **3.12**; **2.3** and **3.13**; **2.3** and **3.14**; **2.3** and **3.15**; **2.3** and **3.16**; **2.3** and **3.17**; **2.3** and **3.18**; **2.4** and **3.8**; **2.4** and **3.9**; **2.4** and **3.10**; **2.4** and **3.11**; **2.4** and **3.12**; **2.4** and **3.13**; **2.4** and **3.14**; **2.4** and **3.15**; **2.4** and **3.16**; **2.4** and **3.17**; **2.4** and **3.18**; **2.5** and **3.8**; **2.5** and **3.9**; **2.5** and **3.10**; **2.5** and **3.11**; **2.5** and **3.12**; **2.5** and **3.13**; **2.5** and **3.14**; **2.5** and **3.15**; **2.5** and **3.16**; **2.5** and **3.17**; **2.5** and **3.18**; **2.6** and **3.8**; **2.6** and **3.9**; **2.6** and **3.10**; **2.6** and **3.11**; **2.6** and **3.12**; **2.6** and **3.13**; **2.6** and **3.14**; **2.6** and **3.15**; **2.6** and **3.16**; **2.6** and **3.17**; **2.6** and **3.18**; **2.7** and **3.8**; **2.7** and **3.9**; **2.7** and **3.10**; **2.7** and **3.11**; **2.7** and **3.12**; **2.7** and **3.13**; **2.7** and **3.14**; **2.7** and **3.15**; **2.7** and **3.16**; **2.7** and **3.17**; **2.7** and **3.18**; **2.8** and **3.8**; **2.8** and **3.9**; **2.8** and **3.10**; **2.8** and **3.11**; **2.8** and **3.12**; **2.8** and **3.13**; **2.8** and **3.14**; **2.8** and **3.15**; **2.8** and **3.16**; **2.8** and **3.17**; **2.8** and **3.18**; **2.9.1** and **3.8**; **2.9.1** and **3.9**; **2.9.1** and **3.10**; **2.9.1** and **3.11**; **2.9.1** and **3.12**; **2.9.1** and **3.13**; **2.9.1** and **3.14**; **2.9.1** and **3.15**; **2.9.1** and **3.16**; **2.9.1** and **3.17**; **2.9.1** and **3.18**; **2.9.2** and **3.8**; **2.9.2** and **3.9**; **2.9.2** and **3.10**; **2.9.2** and **3.11**; **2.9.2** and **3.12**; **2.9.2** and **3.13**; **2.9.2** and **3.14**; **2.9.2** and **3.15**; **2.9.2** and **3.16**; **2.9.2** and **3.17**; **2.9.2** and **3.18**; **2.10.1** and **3.8**; **2.10.1** and **3.9**; **2.10.1** and **3.10**; **2.10.1** and **3.11**; **2.10.1** and **3.12**; **2.10.1** and **3.13**; **2.10.1** and **3.14**; **2.10.1** and **3.15**; **2.10.1** and **3.16**; **2.10.1** and **3.17**; **2.10.1** and **3.18**; **2.10.2** and **3.8**; **2.10.2** and **3.9**; **2.10.2** and **3.10**; **2.10.2** and **3.11**; **2.10.2** and **3.12**; **2.10.2** and **3.13**; **2.10.2** and **3.14**; **2.10.2** and **3.15**; **2.10.2** and **3.16**; **2.10.2** and **3.17**; **2.10.2** and **3.18**; **2.11.5** and **3.8**; **2.11.5** and **3.9**; **2.11.5** and **3.10**; **2.11.5** and **3.11**; **2.11.5** and **3.12**; **2.11.5** and **3.13**; **2.11.5** and **3.14**; **2.11.5** and **3.15**; **2.11.5** and **3.16**; **2.11.5** and **3.17**; **2.11.5** and **3.18**; **2.11.6** and **3.8**; **2.11.6** and **3.9**; **2.11.6** and **3.10**; **2.11.6** and **3.11**; **2.11.6** and **3.12**; **2.11.6** and **3.13**; **2.11.6** and **3.14**; **2.11.6** and **3.15**; **2.11.6** and **3.16**; **2.11.6** and **3.17**; **2.11.6** and **3.18**; **2.12.2** and **3.8**; **2.12.2** and **3.9**; **2.12.2** and **3.10**; **2.12.2** and **3.11**; **2.12.2** and **3.12**; **2.12.2** and **3.13**; **2.12.2** and **3.14**; **2.12.2** and **3.15**; **2.12.2** and **3.16**; **2.12.2** and **3.17**; **2.12.2** and **3.18**; **2.12.4** and **3.8**; **2.12.4** and **3.9**; **2.12.4** and **3.10**; **2.12.4** and **3.11**; **2.12.4** and **3.12**; **2.12.4** and **3.13**; **2.12.4** and **3.14**; **2.12.4** and **3.15**; **2.12.4** and **3.16**; **2.12.4** and **3.17**; **2.12.4** and **3.18**; **2.13.1** and **3.8**; **2.13.1** and **3.9**; **2.13.1** and **3.10**; **2.13.1** and **3.11**;

2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.4, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11;

2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.5, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11;

2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.6, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11;

2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.7, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10;

2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.8, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12; 2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and

3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Examples of equally preferred medicament combinations according to the invention contain as the betamimetic compound 1.9, or a pharmacologically acceptable acid addition salt thereof and in addition 2.1 and 3.8; 2.1 and 3.9; 2.1 and 3.10; 2.1 and 3.11; 2.1 and 3.12; 2.1 and 3.13; 2.1 and 3.14; 2.1 and 3.15; 2.1 and 3.16; 2.1 and 3.17; 2.1 and 3.18; 2.2 and 3.8; 2.2 and 3.9; 2.2 and 3.10; 2.2 and 3.11; 2.2 and 3.12; 2.2 and 3.13; 2.2 and 3.14; 2.2 and 3.15; 2.2 and 3.16; 2.2 and 3.17; 2.2 and 3.18; 2.3 and 3.8; 2.3 and 3.9; 2.3 and 3.10; 2.3 and 3.11; 2.3 and 3.12; 2.3 and 3.13; 2.3 and 3.14; 2.3 and 3.15; 2.3 and 3.16; 2.3 and 3.17; 2.3 and 3.18; 2.4 and 3.8; 2.4 and 3.9; 2.4 and 3.10; 2.4 and 3.11; 2.4 and 3.12;

2.4 and 3.13; 2.4 and 3.14; 2.4 and 3.15; 2.4 and 3.16; 2.4 and 3.17; 2.4 and 3.18; 2.5 and 3.8; 2.5 and 3.9; 2.5 and 3.10; 2.5 and 3.11; 2.5 and 3.12; 2.5 and 3.13; 2.5 and 3.14; 2.5 and 3.15; 2.5 and 3.16; 2.5 and 3.17; 2.5 and 3.18; 2.6 and 3.8; 2.6 and 3.9; 2.6 and 3.10; 2.6 and 3.11; 2.6 and 3.12; 2.6 and 3.13; 2.6 and 3.14; 2.6 and 3.15; 2.6 and 3.16; 2.6 and 3.17; 2.6 and 3.18; 2.7 and 3.8; 2.7 and 3.9; 2.7 and 3.10; 2.7 and 3.11; 2.7 and 3.12; 2.7 and 3.13; 2.7 and 3.14; 2.7 and 3.15; 2.7 and 3.16; 2.7 and 3.17; 2.7 and 3.18; 2.8 and 3.8; 2.8 and 3.9; 2.8 and 3.10; 2.8 and 3.11; 2.8 and 3.12; 2.8 and 3.13; 2.8 and 3.14; 2.8 and 3.15; 2.8 and 3.16; 2.8 and 3.17; 2.8 and 3.18; 2.9.1 and 3.8; 2.9.1 and 3.9; 2.9.1 and 3.10; 2.9.1 and 3.11; 2.9.1 and 3.12; 2.9.1 and 3.13; 2.9.1 and 3.14; 2.9.1 and 3.15; 2.9.1 and 3.16; 2.9.1 and 3.17; 2.9.1 and 3.18; 2.9.2 and 3.8; 2.9.2 and 3.9; 2.9.2 and 3.10; 2.9.2 and 3.11; 2.9.2 and 3.12; 2.9.2 and 3.13; 2.9.2 and 3.14; 2.9.2 and 3.15; 2.9.2 and 3.16; 2.9.2 and 3.17; 2.9.2 and 3.18; 2.10.1 and 3.8; 2.10.1 and 3.9; 2.10.1 and 3.10; 2.10.1 and 3.11; 2.10.1 and 3.12; 2.10.1 and 3.13; 2.10.1 and 3.14; 2.10.1 and 3.15; 2.10.1 and 3.16; 2.10.1 and 3.17; 2.10.1 and 3.18; 2.10.2 and 3.8; 2.10.2 and 3.9; 2.10.2 and 3.10; 2.10.2 and 3.11; 2.10.2 and 3.12; 2.10.2 and 3.13; 2.10.2 and 3.14; 2.10.2 and 3.15; 2.10.2 and 3.16; 2.10.2 and 3.17; 2.10.2 and 3.18; 2.11.5 and 3.8; 2.11.5 and 3.9; 2.11.5 and 3.10; 2.11.5 and 3.11; 2.11.5 and 3.12; 2.11.5 and 3.13; 2.11.5 and 3.14; 2.11.5 and 3.15; 2.11.5 and 3.16; 2.11.5 and 3.17; 2.11.5 and 3.18; 2.11.6 and 3.8; 2.11.6 and 3.9; 2.11.6 and 3.10; 2.11.6 and 3.11; 2.11.6 and 3.12; 2.11.6 and 3.13; 2.11.6 and 3.14; 2.11.6 and 3.15; 2.11.6 and 3.16; 2.11.6 and 3.17; 2.11.6 and 3.18; 2.12.2 and 3.8; 2.12.2 and 3.9; 2.12.2 and 3.10; 2.12.2 and 3.11; 2.12.2 and 3.12; 2.12.2 and 3.13; 2.12.2 and 3.14; 2.12.2 and 3.15; 2.12.2 and 3.16; 2.12.2 and 3.17; 2.12.2 and 3.18; 2.12.4 and 3.8; 2.12.4 and 3.9; 2.12.4 and 3.10; 2.12.4 and 3.11; 2.12.4 and 3.12; 2.12.4 and 3.13; 2.12.4 and 3.14; 2.12.4 and 3.15; 2.12.4 and 3.16; 2.12.4 and 3.17; 2.12.4 and 3.18; 2.13.1 and 3.8; 2.13.1 and 3.9; 2.13.1 and 3.10; 2.13.1 and 3.11; 2.13.1 and 3.12; 2.13.1 and 3.13; 2.13.1 and 3.14; 2.13.1 and 3.15; 2.13.1 and 3.16; 2.13.1 and 3.17; 2.13.1 and 3.18; 2.13.2 and 3.8; 2.13.2 and 3.9; 2.13.2 and 3.10; 2.13.2 and 3.11; 2.13.2 and 3.12; 2.13.2 and 3.13; 2.13.2 and 3.14; 2.13.2 and 3.15; 2.13.2 and 3.16; 2.13.2 and 3.17 , or 2.13.2 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Particularly preferred examples of particularly preferred medicament combinations according to the invention are selected from the group comprising the following

combinations: compounds 1.1 and 2.1 and 3.8; 1.1 and 2.1 and 3.9; 1.1 and 2.1 and 3.10; 1.1 and 2.1 and 3.11; 1.1 and 2.1 and 3.15; 1.1 and 2.1 and 3.17; 1.1 and 2.1 and 3.18; 1.1 and 2.5 and 3.8; 1.1 and 2.5 and 3.9; 1.1 and 2.5 and 3.10; 1.1 and 2.5 and 3.11; 1.1 and 2.5 and 3.15; 1.1 and 2.5 and 3.17; 1.1 and 2.5 and 3.18; 1.1 and 2.7 and 3.8; 1.1 and 2.7 and 3.9; 1.1 and 2.7 and 3.10; 1.1 and 2.7 and 3.11; 1.1 and 2.7 and 3.15; 1.1 and 2.7 and 3.17; 1.1 and 2.7 and 3.18; 1.1 and 2.9.1 and 3.8; 1.1 and 2.9.1 and 3.9; 1.1 and 2.9.1 and 3.10; 1.1 and 2.9.1 and 3.11; 1.1 and 2.9.1 and 3.15; 1.1 and 2.9.1 and 3.17; 1.1 and 2.9.1 and 3.18; 1.1 and 2.9.2 and 3.8; 1.1 and 2.9.2 and 3.9; 1.1 and 2.9.2 and 3.10; 1.1 and 2.9.2 and 3.11; 1.1 and 2.9.2 and 3.15; 1.1 and 2.9.2 and 3.17; 1.1 and 2.9.2 and 3.18; 1.1 and 2.10.1 and 3.8; 1.1 and 2.10.1 and 3.9; 1.1 and 2.10.1 and 3.10; 1.1 and 2.10.1 and 3.11; 1.1 and 2.10.1 and 3.15; 1.1 and 2.10.1 and 3.17; 1.1 and 2.10.1 and 3.18; 1.1 and 2.10.2 and 3.8; 1.1 and 2.10.2 and 3.9; 1.1 and 2.10.2 and 3.10; 1.1 and 2.10.2 and 3.11; 1.1 and 2.10.2 and 3.15; 1.1 and 2.10.2 and 3.17; 1.1 and 2.10.2 and 3.18; 1.1 and 2.11.5 and 3.8; 1.1 and 2.11.5 and 3.9; 1.1 and 2.11.5 and 3.10; 1.1 and 2.11.5 and 3.11; 1.1 and 2.11.5 and 3.15; 1.1 and 2.11.5 and 3.17; 1.1 and 2.11.5 and 3.18; 1.1 and 2.11.6 and 3.8; 1.1 and 2.11.6 and 3.9; 1.1 and 2.11.6 and 3.10; 1.1 and 2.11.6 and 3.11; 1.1 and 2.11.6 and 3.15; 1.1 and 2.11.6 and 3.17 or 1.1; 2.11.6 and 3.18; 1.2 and 2.1 and 3.8; 1.2 and 2.1 and 3.9; 1.2 and 2.1 and 3.10; 1.2 and 2.1 and 3.11; 1.2 and 2.1 and 3.15; 1.2 and 2.1 and 3.17; 1.2 and 2.1 and 3.18; 1.2 and 2.5 and 3.8; 1.2 and 2.5 and 3.9; 1.2 and 2.5 and 3.10; 1.2 and 2.5 and 3.11; 1.2 and 2.5 and 3.15; 1.2 and 2.5 and 3.17; 1.2 and 2.5 and 3.18; 1.2 and 2.7 and 3.8; 1.2 and 2.7 and 3.9; 1.2 and 2.7 and 3.10; 1.2 and 2.7 and 3.11; 1.2 and 2.7 and 3.15; 1.2 and 2.7 and 3.17; 1.2 and 2.7 and 3.18; 1.2 and 2.9.1 and 3.8; 1.2 and 2.9.1 and 3.9; 1.2 and 2.9.1 and 3.10; 1.2 and 2.9.1 and 3.11; 1.2 and 2.9.1 and 3.15; 1.2 and 2.9.1 and 3.17; 1.2 and 2.9.1 and 3.18; 1.2 and 2.9.2 and 3.8; 1.2 and 2.9.2 and 3.9; 1.2 and 2.9.2 and 3.10; 1.2 and 2.9.2 and 3.11; 1.2 and 2.9.2 and 3.15; 1.2 and 2.9.2 and 3.17; 1.2 and 2.9.2 and 3.18; 1.2 and 2.10.1 and 3.8; 1.2 and 2.10.1 and 3.9; 1.2 and 2.10.1 and 3.10; 1.2 and 2.10.1 and 3.11; 1.2 and 2.10.1 and 3.15; 1.2 and 2.10.1 and 3.17; 1.2 and 2.10.1 and 3.18; 1.2 and 2.10.2 and 3.8; 1.2 and 2.10.2 and 3.9; 1.2 and 2.10.2 and 3.10; 1.2 and 2.10.2 and 3.11; 1.2 and 2.10.2 and 3.15; 1.2 and 2.10.2 and 3.17; 1.2 and 2.10.2 and 3.18; 1.2 and 2.11.5 and 3.8; 1.2 and 2.11.5 and 3.9; 1.2 and 2.11.5 and 3.10; 1.2 and 2.11.5 and 3.11; 1.2 and 2.11.5 and 3.15; 1.2 and 2.11.5 and 3.17; 1.2 and 2.11.5 and 3.18; 1.2 and 2.11.6 and 3.8; 1.2 and 2.11.6 and 3.9; 1.2 and 2.11.6 and 3.10; 1.2 and 2.11.6 and 3.11; 1.2 and 2.11.6 and 3.15; 1.2 and 2.11.6 and 3.17 or 1.2; 2.11.6 and 3.18; 1.3 and 2.1 and 3.8; 1.3 and 2.1 and 3.9; 1.3 and 2.1 and 3.10; 1.3 and 2.1 and 3.11; 1.3 and 2.1 and 3.15; 1.3 and 2.1 and 3.17; 1.3 and 2.1 and 3.18; 1.3 and 2.5 and 3.8; 1.3 and 2.5 and 3.9; 1.3 and 2.5 and

3.10; 1.3 and 2.5 and 3.11; 1.3 and 2.5 and 3.15; 1.3 and 2.5 and 3.17; 1.3 and 2.5 and 3.18; 1.3 and 2.7 and 3.8; 1.3 and 2.7 and 3.9; 1.3 and 2.7 and 3.10; 1.3 and 2.7 and 3.11; 1.3 and 2.7 and 3.15; 1.3 and 2.7 and 3.17; 1.3 and 2.7 and 3.18; 1.3 and 2.9.1 and 3.8; 1.3 and 2.9.1 and 3.9; 1.3 and 2.9.1 and 3.10; 1.3 and 2.9.1 and 3.11; 1.3 and 2.9.1 and 3.15; 1.3 and 2.9.1 and 3.17; 1.3 and 2.9.1 and 3.18; 1.3 and 2.9.2 and 3.8; 1.3 and 2.9.2 and 3.9; 1.3 and 2.9.2 and 3.10; 1.3 and 2.9.2 and 3.11; 1.3 and 2.9.2 and 3.15; 1.3 and 2.9.2 and 3.17; 1.3 and 2.9.2 and 3.18; 1.3 and 2.10.1 and 3.8; 1.3 and 2.10.1 and 3.9; 1.3 and 2.10.1 and 3.10; 1.3 and 2.10.1 and 3.11; 1.3 and 2.10.1 and 3.15; 1.3 and 2.10.1 and 3.17; 1.3 and 2.10.1 and 3.18; 1.3 and 2.10.2 and 3.8; 1.3 and 2.10.2 and 3.9; 1.3 and 2.10.2 and 3.10; 1.3 and 2.10.2 and 3.11; 1.3 and 2.10.2 and 3.15; 1.3 and 2.10.2 and 3.17; 1.3 and 2.10.2 and 3.18; 1.3 and 2.11.5 and 3.8; 1.3 and 2.11.5 and 3.9; 1.3 and 2.11.5 and 3.10; 1.3 and 2.11.5 and 3.11; 1.3 and 2.11.5 and 3.15; 1.3 and 2.11.5 and 3.17; 1.3 and 2.11.5 and 3.18; 1.3 and 2.11.6 and 3.8; 1.3 and 2.11.6 and 3.9; 1.3 and 2.11.6 and 3.10; 1.3 and 2.11.6 and 3.11; 1.3 and 2.11.6 and 3.15; 1.3 and 2.11.6 and 3.17 or 1.3; 2.11.6 and 3.18; 1.4 and 2.1 and 3.8; 1.4 and 2.1 and 3.9; 1.4 and 2.1 and 3.10; 1.4 and 2.1 and 3.11; 1.4 and 2.1 and 3.15; 1.4 and 2.1 and 3.17; 1.4 and 2.1 and 3.18; 1.4 and 2.5 and 3.8; 1.4 and 2.5 and 3.9; 1.4 and 2.5 and 3.10; 1.4 and 2.5 and 3.11; 1.4 and 2.5 and 3.15; 1.4 and 2.5 and 3.17; 1.4 and 2.5 and 3.18; 1.4 and 2.7 and 3.8; 1.4 and 2.7 and 3.9; 1.4 and 2.7 and 3.10; 1.4 and 2.7 and 3.11; 1.4 and 2.7 and 3.15; 1.4 and 2.7 and 3.17; 1.4 and 2.7 and 3.18; 1.4 and 2.9.1 and 3.8; 1.4 and 2.9.1 and 3.9; 1.4 and 2.9.1 and 3.10; 1.4 and 2.9.1 and 3.11; 1.4 and 2.9.1 and 3.15; 1.4 and 2.9.1 and 3.17; 1.4 and 2.9.1 and 3.18; 1.4 and 2.9.2 and 3.8; 1.4 and 2.9.2 and 3.9; 1.4 and 2.9.2 and 3.10; 1.4 and 2.9.2 and 3.11; 1.4 and 2.9.2 and 3.15; 1.4 and 2.9.2 and 3.17; 1.4 and 2.9.2 and 3.18; 1.4 and 2.10.1 and 3.8; 1.4 and 2.10.1 and 3.9; 1.4 and 2.10.1 and 3.10; 1.4 and 2.10.1 and 3.11; 1.4 and 2.10.1 and 3.15; 1.4 and 2.10.1 and 3.17; 1.4 and 2.10.1 and 3.18; 1.4 and 2.10.2 and 3.8; 1.4 and 2.10.2 and 3.9; 1.4 and 2.10.2 and 3.10; 1.4 and 2.10.2 and 3.11; 1.4 and 2.10.2 and 3.15; 1.4 and 2.10.2 and 3.17; 1.4 and 2.10.2 and 3.18; 1.4 and 2.11.5 and 3.8; 1.4 and 2.11.5 and 3.9; 1.4 and 2.11.5 and 3.10; 1.4 and 2.11.5 and 3.11; 1.4 and 2.11.5 and 3.15; 1.4 and 2.11.5 and 3.17; 1.4 and 2.11.5 and 3.18; 1.4 and 2.11.6 and 3.8; 1.4 and 2.11.6 and 3.9; 1.4 and 2.11.6 and 3.10; 1.4 and 2.11.6 and 3.11; 1.4 and 2.11.6 and 3.15; 1.4 and 2.11.6 and 3.17 or 1.4; 2.11.6 and 3.18; 1.5 and 2.1 and 3.8; 1.5 and 2.1 and 3.9; 1.5 and 2.1 and 3.10; 1.5 and 2.1 and 3.11; 1.5 and 2.1 and 3.15; 1.5 and 2.1 and 3.17; 1.5 and 2.1 and 3.18; 1.5 and 2.5 and 3.8; 1.5 and 2.5 and 3.9; 1.5 and 2.5 and 3.10; 1.5 and 2.5 and 3.11; 1.5 and 2.5 and 3.15; 1.5 and 2.5 and 3.17; 1.5 and 2.5 and 3.18; 1.5 and 2.7 and 3.8; 1.5 and 2.7 and 3.9; 1.5 and 2.7 and 3.10; 1.5 and 2.7 and 3.11; 1.5 and 2.7 and 3.15; 1.5 and 2.7 and 3.17; 1.5 and 2.7

and 3.18; 1.5 and 2.9.1 and 3.8; 1.5 and 2.9.1 and 3.9; 1.5 and 2.9.1 and 3.10; 1.5 and 2.9.1 and 3.11; 1.5 and 2.9.1 and 3.15; 1.5 and 2.9.1 and 3.17; 1.5 and 2.9.1 and 3.18; 1.5 and 2.9.2 and 3.8; 1.5 and 2.9.2 and 3.9; 1.5 and 2.9.2 and 3.10; 1.5 and 2.9.2 and 3.11; 1.5 and 2.9.2 and 3.15; 1.5 and 2.9.2 and 3.17; 1.5 and 2.9.2 and 3.18; 1.5 and 2.10.1 and 3.8; 1.5 and 2.10.1 and 3.9; 1.5 and 2.10.1 and 3.10; 1.5 and 2.10.1 and 3.11; 1.5 and 2.10.1 and 3.15; 1.5 and 2.10.1 and 3.17; 1.5 and 2.10.1 and 3.18; 1.5 and 2.10.2 and 3.8; 1.5 and 2.10.2 and 3.9; 1.5 and 2.10.2 and 3.10; 1.5 and 2.10.2 and 3.11; 1.5 and 2.10.2 and 3.15; 1.5 and 2.10.2 and 3.17; 1.5 and 2.10.2 and 3.18; 1.5 and 2.11.5 and 3.8; 1.5 and 2.11.5 and 3.9; 1.5 and 2.11.5 and 3.10; 1.5 and 2.11.5 and 3.11; 1.5 and 2.11.5 and 3.15; 1.5 and 2.11.5 and 3.17; 1.5 and 2.11.5 and 3.18; 1.5 and 2.11.6 and 3.8; 1.5 and 2.11.6 and 3.9; 1.5 and 2.11.6 and 3.10; 1.5 and 2.11.6 and 3.11; 1.5 and 2.11.6 and 3.15; 1.5 and 2.11.6 and 3.17 or 1.5; 2.11.6 and 3.18; 1.6 and 2.1 and 3.8; 1.6 and 2.1 and 3.9; 1.6 and 2.1 and 3.10; 1.6 and 2.1 and 3.11; 1.6 and 2.1 and 3.15; 1.6 and 2.1 and 3.17; 1.6 and 2.1 and 3.18; 1.6 and 2.5 and 3.8; 1.6 and 2.5 and 3.9; 1.6 and 2.5 and 3.10; 1.6 and 2.5 and 3.11; 1.6 and 2.5 and 3.15; 1.6 and 2.5 and 3.17; 1.6 and 2.5 and 3.18; 1.6 and 2.7 and 3.8; 1.6 and 2.7 and 3.9; 1.6 and 2.7 and 3.10; 1.6 and 2.7 and 3.11; 1.6 and 2.7 and 3.15; 1.6 and 2.7 and 3.17; 1.6 and 2.7 and 3.18; 1.6 and 2.9.1 and 3.8; 1.6 and 2.9.1 and 3.9; 1.6 and 2.9.1 and 3.10; 1.6 and 2.9.1 and 3.11; 1.6 and 2.9.1 and 3.15; 1.6 and 2.9.1 and 3.17; 1.6 and 2.9.1 and 3.18; 1.6 and 2.9.2 and 3.8; 1.6 and 2.9.2 and 3.9; 1.6 and 2.9.2 and 3.10; 1.6 and 2.9.2 and 3.11; 1.6 and 2.9.2 and 3.15; 1.6 and 2.9.2 and 3.17; 1.6 and 2.9.2 and 3.18; 1.6 and 2.10.1 and 3.8; 1.6 and 2.10.1 and 3.9; 1.6 and 2.10.1 and 3.10; 1.6 and 2.10.1 and 3.11; 1.6 and 2.10.1 and 3.15; 1.6 and 2.10.1 and 3.17; 1.6 and 2.10.1 and 3.18; 1.6 and 2.10.2 and 3.8; 1.6 and 2.10.2 and 3.9; 1.6 and 2.10.2 and 3.10; 1.6 and 2.10.2 and 3.11; 1.6 and 2.10.2 and 3.15; 1.6 and 2.10.2 and 3.17; 1.6 and 2.10.2 and 3.18; 1.6 and 2.11.5 and 3.8; 1.6 and 2.11.5 and 3.9; 1.6 and 2.11.5 and 3.10; 1.6 and 2.11.5 and 3.11; 1.6 and 2.11.5 and 3.15; 1.6 and 2.11.5 and 3.17; 1.6 and 2.11.5 and 3.18; 1.6 and 2.11.6 and 3.8; 1.6 and 2.11.6 and 3.9; 1.6 and 2.11.6 and 3.10; 1.6 and 2.11.6 and 3.11; 1.6 and 2.11.6 and 3.15; 1.6 and 2.11.6 and 3.17 or 1.6; 2.11.6 and 3.18 ; 1.7 and 2.1 and 3.8; 1.7 and 2.1 and 3.9; 1.7 and 2.1 and 3.10; 1.7 and 2.1 and 3.11; 1.7 and 2.1 and 3.15; 1.7 and 2.1 and 3.17; 1.7 and 2.1 and 3.18; 1.7 and 2.5 and 3.8; 1.7 and 2.5 and 3.9; 1.7 and 2.5 and 3.10; 1.7 and 2.5 and 3.11; 1.7 and 2.5 and 3.15; 1.7 and 2.5 and 3.17; 1.7 and 2.5 and 3.18; 1.7 and 2.7 and 3.8; 1.7 and 2.7 and 3.9; 1.7 and 2.7 and 3.10; 1.7 and 2.7 and 3.11; 1.7 and 2.7 and 3.15; 1.7 and 2.7 and 3.17; 1.7 and 2.7 and 3.18; 1.7 and 2.9.1 and 3.8; 1.7 and 2.9.1 and 3.9; 1.7 and 2.9.1 and 3.10; 1.7 and 2.9.1 and 3.11; 1.7 and 2.9.1 and 3.15; 1.7 and 2.9.1 and 3.17; 1.7 and 2.9.1 and 3.18; 1.7 and 2.9.2 and 3.8; 1.7 and 2.9.2 and 3.9; 1.7 and

2.9.2 and 3.10; 1.7 and 2.9.2 and 3.11; 1.7 and 2.9.2 and 3.15; 1.7 and 2.9.2 and 3.17; 1.7 and 2.9.2 and 3.18; 1.7 and 2.10.1 and 3.8; 1.7 and 2.10.1 and 3.9; 1.7 and 2.10.1 and 3.10; 1.7 and 2.10.1 and 3.11; 1.7 and 2.10.1 and 3.15; 1.7 and 2.10.1 and 3.17; 1.7 and 2.10.1 and 3.18; 1.7 and 2.10.2 and 3.8; 1.7 and 2.10.2 and 3.9; 1.7 and 2.10.2 and 3.10; 1.7 and 2.10.2 and 3.11; 1.7 and 2.10.2 and 3.15; 1.7 and 2.10.2 and 3.17; 1.7 and 2.10.2 and 3.18; 1.7 and 2.11.5 and 3.8; 1.7 and 2.11.5 and 3.9; 1.7 and 2.11.5 and 3.10; 1.7 and 2.11.5 and 3.11; 1.7 and 2.11.5 and 3.15; 1.7 and 2.11.5 and 3.17; 1.7 and 2.11.5 and 3.18; 1.7 and 2.11.6 and 3.8; 1.7 and 2.11.6 and 3.9; 1.7 and 2.11.6 and 3.10; 1.7 and 2.11.6 and 3.11; 1.7 and 2.11.6 and 3.15; 1.7 and 2.11.6 and 3.17 or 1.7; 2.11.6 and 3.18; 1.8 and 2.1 and 3.8; 1.8 and 2.1 and 3.9; 1.8 and 2.1 and 3.10; 1.8 and 2.1 and 3.11; 1.8 and 2.1 and 3.15; 1.8 and 2.1 and 3.17; 1.8 and 2.1 and 3.18; 1.8 and 2.5 and 3.8; 1.8 and 2.5 and 3.9; 1.8 and 2.5 and 3.10; 1.8 and 2.5 and 3.11; 1.8 and 2.5 and 3.15; 1.8 and 2.5 and 3.17; 1.8 and 2.5 and 3.18; 1.8 and 2.7 and 3.8; 1.8 and 2.7 and 3.9; 1.8 and 2.7 and 3.10; 1.8 and 2.7 and 3.11; 1.8 and 2.7 and 3.15; 1.8 and 2.7 and 3.17; 1.8 and 2.7 and 3.18; 1.8 and 2.9.1 and 3.8; 1.8 and 2.9.1 and 3.9; 1.8 and 2.9.1 and 3.10; 1.8 and 2.9.1 and 3.11; 1.8 and 2.9.1 and 3.15; 1.8 and 2.9.1 and 3.17; 1.8 and 2.9.1 and 3.18; 1.8 and 2.9.2 and 3.8; 1.8 and 2.9.2 and 3.9; 1.8 and 2.9.2 and 3.10; 1.8 and 2.9.2 and 3.11; 1.8 and 2.9.2 and 3.15; 1.8 and 2.9.2 and 3.17; 1.8 and 2.9.2 and 3.18; 1.8 and 2.10.1 and 3.8; 1.8 and 2.10.1 and 3.9; 1.8 and 2.10.1 and 3.10; 1.8 and 2.10.1 and 3.11; 1.8 and 2.10.1 and 3.15; 1.8 and 2.10.1 and 3.17; 1.8 and 2.10.1 and 3.18; 1.8 and 2.10.2 and 3.8; 1.8 and 2.10.2 and 3.9; 1.8 and 2.10.2 and 3.10; 1.8 and 2.10.2 and 3.11; 1.8 and 2.10.2 and 3.15; 1.8 and 2.10.2 and 3.17; 1.8 and 2.10.2 and 3.18; 1.8 and 2.11.5 and 3.8; 1.8 and 2.11.5 and 3.9; 1.8 and 2.11.5 and 3.10; 1.8 and 2.11.5 and 3.11; 1.8 and 2.11.5 and 3.15; 1.8 and 2.11.5 and 3.17; 1.8 and 2.11.5 and 3.18; 1.8 and 2.11.6 and 3.8; 1.8 and 2.11.6 and 3.9; 1.8 and 2.11.6 and 3.10; 1.8 and 2.11.6 and 3.11; 1.8 and 2.11.6 and 3.15; 1.8 and 2.11.6 and 3.17 or 1.8; 2.11.6 and 3.18; 1.9 and 2.1 and 3.8; 1.9 and 2.1 and 3.9; 1.9 and 2.1 and 3.10; 1.9 and 2.1 and 3.11; 1.9 and 2.1 and 3.15; 1.9 and 2.1 and 3.17; 1.9 and 2.1 and 3.18; 1.9 and 2.5 and 3.8; 1.9 and 2.5 and 3.9; 1.9 and 2.5 and 3.10; 1.9 and 2.5 and 3.11; 1.9 and 2.5 and 3.15; 1.9 and 2.5 and 3.17; 1.9 and 2.5 and 3.18; 1.9 and 2.7 and 3.8; 1.9 and 2.7 and 3.9; 1.9 and 2.7 and 3.10; 1.9 and 2.7 and 3.11; 1.9 and 2.7 and 3.15; 1.9 and 2.7 and 3.17; 1.9 and 2.7 and 3.18; 1.9 and 2.9.1 and 3.8; 1.9 and 2.9.1 and 3.9; 1.9 and 2.9.1 and 3.10; 1.9 and 2.9.1 and 3.11; 1.9 and 2.9.1 and 3.15; 1.9 and 2.9.1 and 3.17; 1.9 and 2.9.1 and 3.18; 1.9 and 2.9.2 and 3.8; 1.9 and 2.9.2 and 3.9; 1.9 and 2.9.2 and 3.10; 1.9 and 2.9.2 and 3.11; 1.9 and 2.9.2 and 3.15; 1.9 and 2.9.2 and 3.17; 1.9 and 2.9.2 and 3.18; 1.9 and 2.10.1 and 3.8; 1.9 and 2.10.1 and 3.9; 1.9 and 2.10.1 and 3.10; 1.9 and 2.10.1 and 3.11; 1.9 and 2.10.1 and 3.15;

1.9 and 2.10.1 and 3.17; 1.9 and 2.10.1 and 3.18; 1.9 and 2.10.2 and 3.8; 1.9 and 2.10.2 and 3.9; 1.9 and 2.10.2 and 3.10; 1.9 and 2.10.2 and 3.11; 1.9 and 2.10.2 and 3.15; 1.9 and 2.10.2 and 3.17; 1.9 and 2.10.2 and 3.18; 1.9 and 2.11.5 and 3.8; 1.9 and 2.11.5 and 3.9; 1.9 and 2.11.5 and 3.10; 1.9 and 2.11.5 and 3.11; 1.9 and 2.11.5 and 3.15; 1.9 and 2.11.5 and 3.17; 1.9 and 2.11.5 and 3.18; 1.9 and 2.11.6 and 3.8; 1.9 and 2.11.6 and 3.9; 1.9 and 2.11.6 and 3.10; 1.9 and 2.11.6 and 3.11; 1.9 and 2.11.6 and 3.15; 1.9 and 2.11.6 and 3.17 or 1.9; or 2.11.6 and 3.18, in each case optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the pharmacologically acceptable acid addition salts, solvates and/or hydrates thereof.

Of outstanding importance according to the invention are all those medicament combinations disclosed within the scope of the present invention which contain the compounds of formula 1 in the form of the R-enantiomers thereof.

Unless otherwise stated, the alkyl groups are straight-chained or branched alkyl groups having 1 to 5 carbon atoms. The following are mentioned by way of example: methyl, ethyl, propyl or butyl. In some cases the abbreviations Me, Et, Prop or Bu are used to denote the groups methyl, ethyl, propyl or butyl. Unless otherwise stated, the definitions propyl and butyl include all the possible isomeric forms of the groups in question. Thus, for example, propyl includes *n*-propyl and *iso*-propyl, butyl includes *iso*-butyl, *sec*.butyl and *tert*.-butyl, etc.

Unless otherwise stated, the cycloalkyl groups are alicyclic groups with 3 to 6 carbon atoms. They are the cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl groups . Cyclopropyl is particularly important within the scope of the present invention .

Unless otherwise stated, the alkylene groups are branched and unbranched alkyl bridges with 1 to 4 carbon atoms . Examples include: methylene, ethylene, propylene or butylene.

Unless otherwise stated, the term alkyloxy groups (or alkoxy groups or -O-C_1-C_4-alkyl) denotes branched and unbranched alkyl groups with 1 to 4 carbon atoms which are linked via an oxygen atom. Alkyloxy groups may also Examples include: methyloxy, ethyloxy, propyloxy or butyloxy. In some cases the abbreviations MeO, EtO, PropO or BuO may be used to denote the methyloxy, ethyloxy, propyloxy or butyloxy groups. Unless otherwise stated, the definitions propyloxy and butyloxy include all the possible isomeric forms of

the groups in question. Thus, for example, propyloxy includes *n*-propyloxy and *iso*-propyloxy, butyloxy includes *iso*-butyloxy, *sec.*butyloxy and *tert.*-butyloxy, etc. In some cases the term alkoxy may be used instead of alkyloxy within the scope of the present invention. The groups methyloxy, ethyloxy, propyloxy or butyloxy may therefore also be referred to by the names methoxy, ethoxy, propoxy or butoxy.

Halogen within the scope of the present invention denotes fluorine, chlorine, bromine or iodine. Unless stated otherwise, fluorine and bromine are the preferred halogens. The group CO denotes a carbonyl group.

The term phenylen denotes a phenyl bridging group "-C_6H_4-".

Within the scope of the present invention by a pharmaceutical combination of components **1**, **2** and **3** is meant the joint administration of the active substances in a single preparation or formulation or the separate administration of the active substances in separate formulations. If the active substances **1**, **2** and **3** are administered in separate formulations, this separate administration may be done simultaneously or at different times, i.e. successively. If the active substances **1**, **2** and **3** are administered in separate formulations, these separate formulations may also contain combinations of two of the three active substances.

In one aspect the present invention relates to the above-mentioned medicament combinations which contain in addition to therapeutically effective amounts of **1**, **2** and **3** a pharmaceutically acceptable carrier. In one aspect the present invention relates to the above-mentioned pharmaceutical compositions which do not contain a pharmaceutically acceptable carrier in addition to therapeutically effective amounts of **1**, **2** and **3**.

The present invention also relates to the use of therapeutically effective amounts of the active substances **1** for preparing a pharmaceutical composition also containing one or more, preferably one active substance **2** and one or more, preferably one active substance **3** for the treatment of inflammatory and obstructive respiratory complaints, for inhibiting premature labour in midwifery (tocolysis), for restoring sinus rhythm in the heart in atrioventricular block, for correcting bradycardic heart rhythm disorders (antiarrhythmic), for treating circulatory shock (vasodilatation and increasing the heart volume) as well as for the treatment of skin irritations and inflammation .

In a preferred aspect the present invention relates to the use of therapeutically effective amounts of the active substance **1** for preparing a pharmaceutical composition also containing one or more, preferably one, active substance **2** and one or more, preferably one active substance **3** for the treatment of respiratory complaints selected from the group comprising obstructive pulmonary diseases of various origins, pulmonary emphysema of various origins, restrictive pulmonary diseases, interstitial pulmonary diseases, cystic fibrosis, bronchitis of various origins, bronchiectasis, ARDS (adult respiratory distress syndrome) and all forms of pulmonary oedema.

The present invention also relates to the use of therapeutically effective amounts of the active substances **2** for preparing a pharmaceutical composition also containing one or more, preferably one active substance **1** and one or more, preferably one active substance **3** for the treatment of inflammatory and obstructive respiratory complaints, for inhibiting premature labour in midwifery (tocolysis), for restoring sinus rhythm in the heart in atrioventricular block, for correcting bradycardic heart rhythm disorders (antiarrhythmic), for treating circulatory shock (vasodilatation and increasing the heart volume) as well as for the treatment of skin irritations and inflammation .

In a preferred aspect the present invention relates to the use of therapeutically effective amounts of the active substance **2** for preparing a pharmaceutical composition also containing one or more, preferably one, active substance **1** and one or more, preferably one active substance **3** for the treatment of respiratory complaints selected from the group comprising obstructive pulmonary diseases of various origins, pulmonary emphysema of various origins, restrictive pulmonary diseases, interstitial pulmonary diseases, cystic fibrosis, bronchitis of various origins, bronchiectasis, ARDS (adult respiratory distress syndrome) and all forms of pulmonary oedema.

The present invention also relates to the use of therapeutically effective amounts of the active substances **3** for preparing a pharmaceutical composition also containing one or more, preferably one active substance **1** and one or more, preferably one active substance **2** for the treatment of inflammatory and obstructive respiratory complaints, for inhibiting premature labour in midwifery (tocolysis), for restoring sinus rhythm in the heart in atrioventricular block, for correcting bradycardic heart rhythm disorders (antiarrhythmic), for treating circulatory shock (vasodilation and increasing the heart volume) as well as for

the treatment of skin irritations and inflammation .

In a preferred aspect the present invention relates to the use of therapeutically effective amounts of the active substance **3** for preparing a pharmaceutical composition also containing one or more, preferably one, active substance **1** and one or more, preferably one active substance **2** for the treatment of respiratory complaints selected from the group comprising obstructive pulmonary diseases of various origins, pulmonary emphysema of various origins, restrictive pulmonary diseases, interstitial pulmonary diseases, cystic fibrosis, bronchitis of various origins, bronchiectasis, ARDS (adult respiratory distress syndrome) and all forms of pulmonary oedema.

Preferably the medicament combinations according to the invention are used as specified above for preparing a pharmaceutical composition for the treatment of obstructive pulmonary diseases selected from among bronchial asthma, paediatric asthma, severe asthma, acute asthma attacks, chronic bronchitis and COPD (chronic obstructive pulmonary disease), while it is particularly preferable according to the invention to use them for preparing a pharmaceutical composition for the treatment of bronchial asthma and COPD.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of pulmonary emphysema which has its origins in COPD (chronic obstructive pulmonary disease) or α1-proteinase inhibitor deficiency.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of restrictive pulmonary diseases selected from among allergic alveolitis, restrictive pulmonary diseases triggered by work-related noxious substances, such as asbestosis or silicosis, and restriction caused by lung tumours, such as for example lymphangiosis carcinomatosa, bronchoalveolar carcinoma and lymphomas.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of interstitial pulmonary diseases selected from among pneumonia caused by infections, such as for example infection by viruses, bacteria, fungi, protozoa, helminths or other pathogens, pneumonitis caused by

various factors, such as for example aspiration and left heart insufficiency, radiation-induced pneumonitis or fibrosis, collagenoses, such as for example lupus erythematodes, systemic sclerodermy or sarcoidosis, granulomatoses, such as for example Boeck's disease, idiopathic interstitial pneumonia or idiopathic pulmonary fibrosis (IPF).

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of cystic fibrosis or mucoviscidosis.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of bronchitis, such as for example bronchitis caused by bacterial or viral infection, allergic bronchitis and toxic bronchitis.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of bronchiectasis.

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of ARDS (adult respiratory distress syndrome).

It is also preferable to use the medicament combinations according to the invention for preparing a pharmaceutical composition for the treatment of pulmonary oedema, for example toxic pulmonary oedema after aspiration or inhalation of toxic substances and foreign substances.

It is particularly preferable to use the compounds detailed above for preparing a pharmaceutical composition for the treatment of asthma or COPD. Also of particular importance is the above-mentioned use of medicament combinations according to the invention for preparing a pharmaceutical composition for once-a-day treatment of inflammatory and obstructive respiratory complaints, particularly for the once-a-day treatment of asthma or COPD.

The present invention also relates to the use of therapeutically effective amounts of an active substance of formula **1** in combination with therapeutically effective amounts of

active substances **2** and **3** for preparing a pharmaceutical composition for the treatment of one of the above-mentioned diseases.

The present invention also relates to a process for treating one of the above-mentioned diseases, which is characterised in that therapeutically effective amounts of active substance of formula **1** are administered in combination with therapeutically effective amounts of active substances **2** and **3**.

Within the scope of the medicament combinations according to the invention, for example, 0.1 - 1000μg of a compound of formula **1** may be administered per single dose. Preferably, 1 - 500 μg, particularly preferably 3 - 100 μg of the compound of formula **1** are administered per single dose, while a dosage range of from 5 - 75μg, preferably from 7 - 50 μg is preferred according to the invention. Particularly preferably, the pharmaceutical compositions according to the invention are administered in an amount such that 9 - 40 μg, particularly preferably 11 - 30μg, more preferably 12 - 25 μg of the compound of formula **1** are administered per single dose . For example, and without restricting the present invention thereto, 5μg, 7.5μg, 10μg, 12.5μg, 15μg, 17.5μg, 20μg, 22.5μg, 25μg, 27.5μg, 30μg, 32.5μg, 35μg, 37.5μg, 40μg, 42.5μg, 45μg, 47.5μg, 50μg, 52.5μg, 55μg, 57.5μg, 60μg, 62.5μg, 65μg, 67.5μg, 70μg, 72.5μg or 75μg of a compound of formula **1** may be administered per single dose.

The above-mentioned dosages relate to the compounds of formula **1** in the form of their free bases. If the compounds of formula **1** are administered in the form of their pharmaceutically acceptable acid addition salts, the skilled man can easily calculate the corresponding dosage ranges for the acid addition salts from the dosage ranges specified above, taking into account the molecular weight of the acids used. Particularly preferably, the compounds of formula **1** are administered in the above-mentioned dosage ranges in the form of the enantiomerically pure compounds, particularly preferably in the form of the R-enantiomers thereof.

Without restricting the invention thereto, in the case of tiotropium **2.1'** amounts of anticholinergic (**2.1'**) may be administered such that each single dose contains 0.1 - 80μg, preferably 0.5 - 60 μg, particularly preferably about 1 - 50μg of **2.1'** . For example and without restricting the present invention thereto, 2.5μg, 5μg, 10μg, 18μg, 20μg, 36μg or 40μg **2.1'** may be administered per single dose. The corresponding amount of salt **2.1** or of

any hydrate or solvate used in each case can easily be calculated by the skilled man, depending on the choice of anion. If for example tiotropium bromide is used as the preferred tiotropium salt **2.1** according to the invention, the amounts of the active substance **2.1'** administered per single dose as specified by way of example hereinbefore correspond to the following amounts of **2.1** administered per single dose: 3μg, 6μg, 12μg, 21.7μg, 24.1μg, 43.3μg and 48.1μg **2.1**. In the case of tiotropium **2.1'** the dosages specified above are preferably administered once or twice a day, while administration once a day is particularly preferred according to the invention .

Without restricting the invention thereto, in the case of the cation **2.2'** amounts of anticholinergic (**2.2**') may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 15-200 μg **2.2'** . For example and without restricting the present invention thereto, 15μg, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μg of **2.2'** may be administered per single dose. The corresponding amount of salt **2.2** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of oxitropium **2.2'** the dosages specified above are preferably administered one to four times a day, while administration two to three times a day is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cation **2.3'** amounts of anticholinergic (**2.3**') may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 15-200 μg **2.3'** . For example and without restricting the present invention thereto, 15μg, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μgof **2.3'** may be administered per single dose. The corresponding amount of salt **2.3** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of flutropium **2.3'** the dosages specified above are preferably administered one to four times a day, while administration two to three times a day is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cation **2.4'** amounts of anticholinergic (**2.4'**) may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 20-200 μg **2.4'** . For example and without restricting the present invention thereto, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μg of **2.4'** may be administered per single dose . The corresponding amount of salt **2.4** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of ipratropium **2.4'** the dosages specified above are preferably administered one to four times a day, while administration two to three times a day, more preferably three times a day, is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cation **2.5'** amounts of anticholinergic (**2.5'**) may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 15-200 μg . For example and without restricting the present invention thereto, 15μg, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μg of **2.5'** may be administered per single dose . The corresponding amount of salt **2.5** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of glycopyrronium **2.5'** the dosages specified above are preferably administered one to four times a day, while administration two to three times a day is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cation **2.6'** amounts of anticholinergic (**2.6'**) may be administered such that each single dose contains 1000 - 6500μg, preferably 2000 - 6000μg, particularly preferably 3000 - 5500μg, particularly preferably 4000 - 5000μg **2.6'** . For example and without restricting the present invention thereto, 3500μg, 3750μg, 4000μg, 4250μg, 4500μg, 4750μg, or 5000μg of **2.6'** may be administered per single dose. The corresponding amount of salt **2.6** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of trospiums **2.6'** the dosages specified above are preferably

administered one to four times a day, while administration two to three times a day is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cation **2.7'** amounts of anticholinergic (**2.7'**) may be administered such that each single dose contains 50 - 1000μg, preferably 100 - 800μg, particularly preferably 200 - 700μg, particularly preferably 300 - 600μg **2.7'** . For example and without restricting the present invention thereto, 300μg, 350μg, 400μg, 450μg, 500μg, 550μg, or 600μg of **2.7'** may be administered per single dose. The corresponding amount of salt **2.7** used in each case or of any hydrate or solvate used can easily be calculated by the skilled man, depending on the choice of anion. In the case of the cation **2.7'** the dosages specified above are preferably administered one to three times a day, while administration once or twice a day, more preferably once a day, is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cations **2.9'** and **2.10'** , amounts of anticholinergic (**2.9'** or **2.10'**) may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 15-200 μg **2.9'** or **2.10'** . For example and without restricting the present invention thereto, 15μg, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μg of **2.9'** or **2.10'** may be administered per single dose. The corresponding amount of salt **2.9'** or **2.10'** or of any hydrate or solvate used in each case can easily be calculated by the skilled man, depending on the choice of anion. In the case of the cations **2.9'** or **2.10'** the dosages specified above are preferably administered one to three times a day, while administration once or twice a day, more preferably once a day, is particularly preferred according to the invention.

Without restricting the invention thereto, in the case of the cations **2.11'** to **2.13'** amounts of anticholinergic (**2.11'**, **2.12'** or **2.13'**) may be administered such that each single dose contains 1 - 500μg, preferably 5 - 300 μg, particularly preferably 10-200 μg **2.11'**, **2.12'** or **2.13'** . For example and without restricting the present invention thereto, 10μg, 15μg, 20μg, 25μg, 30μg, 35μg, 40μg, 45μg, 50μg, 55μg, 60μg, 65μg, 70μg, 75μg, 80μg, 85μg, 90μg, 95μg, 100μg, 105μg, 110μg, 115μg, 120μg, 125μg, 130μg, 135μg, 140μg, 145μg, 150μg, 155μg, 160μg, 165μg, 170μg, 175μg, 180μg, 185μg, 190μg, 195μg or 200μg of **2.11'**, **2.12'** or **2.13'** may be administered per single dose . The corresponding amount of

salt **2.11**, **2.12** or **2.13** or of any hydrate or solvate used in each case can easily be calculated by the skilled man, depending on the choice of anion.
In the case of the cations **2.11**, **2.12** or **2.13** the dosages specified above are preferably administered one to three times a day, while administration once or twice a day, more preferably once a day, is particularly preferred according to the invention.

The amount of steroid **3** is preferably about 1 - 10000 µg of **3** per single dose . Preferably, amounts of **3** are administered such that each single dose contains 5 - 5000µg, preferably 5 - 2500 µg, particularly preferably 10-1000 µg of **3** . For example and without restricting the present invention thereto, 10µg, 15µg, 20µg, 25µg, 30µg, 35µg, 40µg, 45µg, 50µg, 55µg, 60µg, 65µg, 70µg, 75µg, 80µg, 85µg, 90µg, 95µg, 100µg, 115µg, 120µg, 125µg, 130µg, 135µg, 140µg, 145µg, 150µg, 155µg, 160µg, 165µg, 170µg, 175µg, 180µg, 185µg, 190µg, 195µg, 200µg, 205µg, 210µg, 215µg, 220µg, 225µg, 230µg, 235µg, 240µg, 245µg, 250µg, 255µg, 260µg, 265µg, 270µg, 275µg, 280µg, 285µg, 290µg, 295µg, 300µg, 305µg, 310µg, 315µg, 320µg, 325µg, 330µg, 335µg, 340µg, 345µg, 350µg, 355µg, 360µg, 365µg, 370µg, 375µg, 380µg, 385µg, 390µg, 395µg, 400µg, 405µg, 410µg, 415µg, 420µg, 425µg, 430µg, 435µg, 440µg, 445µg, 450µg, 455µg, 460µg, 465µg, 470µg, 475µg, 480µg, 485µg, 490µg, 495µg, 500µg, 505µg, 510µg, 515µg, 520µg, 525µg, 530µg, 535µg, 540µg, 545µg, 550µg, 555µg, 560µg, 565µg, 570µg, 575µg, 580µg, 585µg, 590µg, 595µg, 600µg, 605µg, 610µg, 615µg, 620µg, 625µg, 630µg, 635µg, 640µg, 645µg, 650µg, 655µg, 660µg, 665µg, 670µg, 675µg, 680µg, 685µg, 690µg, 695µg, 700µg, 705µg, 710µg, 715µg, 720µg, 725µg, 730µg, 735µg, 740µg, 745µg, 750µg, 755µg, 760µg, 765µg, 770µg, 775µg, 780µg, 785µg, 790µg, 795µg, 800µg, 805µg, 810µg, 815µg, 820µg, 825µg, 830µg, 835µg, 840µg, 845µg, 850µg, 855µg, 860µg, 865µg, 870µg, 875µg, 880µg, 885µg, 890µg, 895µg, 900µg, 905µg, 910µg, 915µg, 920µg, 925µg, 930µg, 935µg, 940µg, 945µg, 950µg, 955µg, 960µg, 965µg, 970µg, 975µg, 980µg, 985µg, 990µg, 995µg or 1000µg of **3** may be administered per single dose. In the event that salts or derivatives of **3** are used, the corresponding amount of salt/derivative used can easily be calculated by the skilled man from the values given hereinbefore, depending on the choice of salt/derivative.

The active substance components **1**, **2** and **3** may be administered - together or separately - in each case by inhalation or by oral, parenteral or some other route, in known manner, in substantially conventional formulations such as for example plain or coated tablets, pills, granules, aerosols, syrups, emulsions, suspensions, powders and solutions, using inert,

non-toxic, pharmaceutically suitable carriers or solvents.

Suitable preparations for administering the active substance components **1**, **2** and **3** include tablets, capsules, suppositories, solutions, powders, etc. The proportion of pharmaceutically active compound or compounds should be in the range from 0.05 to 90 % by weight, preferably 0.1 to 50 % by weight of the total composition. Suitable tablets may be obtained, for example, by mixing the active substance(s) with known excipients, for example inert diluents such as calcium carbonate, calcium phosphate or lactose, disintegrants such as corn starch or alginic acid, binders such as starch or gelatine, lubricants such as magnesium stearate or talc and/or agents for delaying release, such as carboxymethyl cellulose, cellulose acetate phthalate, or polyvinyl acetate. The tablets may also comprise several layers.

Coated tablets may be prepared accordingly by coating cores produced analogously to the tablets with substances normally used for tablet coatings, for example collidone or shellac, gum arabic, talc, titanium dioxide or sugar. To achieve delayed release or prevent incompatibilities the core may also consist of a number of layers. Similarly the tablet coating may consist of a number or layers to achieve delayed release, possibly using the excipients mentioned above for the tablets.

Syrups or elixirs containing the active substances or combinations of active substances according to the invention may additionally contain a sweetener such as saccharine, cyclamate, glycerol or sugar and a flavour enhancer, e.g. a flavouring such as vanilline or orange extract. They may also contain suspension adjuvants or thickeners such as sodium carboxymethyl cellulose, wetting agents such as, for example, condensation products of fatty alcohols with ethylene oxide, or preservatives such as p-hydroxybenzoates.

Solutions are prepared in the usual way, e.g. with the addition of isotonic agents, preservatives such as p-hydroxybenzoates, or stabilisers such as alkali metal salts of ethylenediamine tetraacetic acid, optionally using emulsifiers and/or dispersants, whilst if water is used as the diluent, for example, organic solvents may optionally be used as solvating agents or dissolving aids, and transferred into injection vials or ampoules or infusion bottles.

Capsules containing one or more active substances or combinations of active substances may for example be prepared by mixing the active substances with inert carriers such as lactose or sorbitol and packing them into gelatine capsules.
Suitable suppositories may be made for example by mixing with carriers provided for this purpose, such as neutral fats or polyethyleneglycol or the derivatives thereof.
Excipients which may be used include, for example, water, pharmaceutically acceptable organic solvents such as paraffins (e.g. petroleum fractions), vegetable oils (e.g. groundnut or sesame oil), mono- or polyfunctional alcohols (e.g. ethanol or glycerol), carriers such as e.g. natural mineral powders (e.g. kaolins, clays, talc, chalk), synthetic mineral powders (e.g. highly dispersed silicic acid and silicates), sugars (e.g. cane sugar, lactose and glucose), emulsifiers (e.g. lignin, spent sulphite liquors, methylcellulose, starch and polyvinylpyrrolidone) and lubricants (e.g. magnesium stearate, talc, stearic acid and sodium lauryl sulphate).

For oral administration the tablets may, of course, contain, apart from the abovementioned carriers, additives such as sodium citrate, calcium carbonate and dicalcium phosphate together with various additives such as starch, preferably potato starch, gelatine and the like. Moreover, lubricants such as magnesium stearate, sodium lauryl sulphate and talc may be used at the same time for the tabletting process. In the case of aqueous suspensions the active substances may be combined with various flavour enhancers or colourings in addition to the excipients mentioned above.

Preferably, even when the components **1**, **2** and **3** are administered separately, at least component **1** is administered by inhalation. If component **1** is administered by inhalation, when the active substances are taken separately, components **2** and **3** , inparticular component **3** may also be administered for example by oral or parenteral route using formulations conventional in the art such as plain or coated tablets, pills, granules, aerosols, syrups, emulsions, suspensions, powders and solutions, using inert, non-toxic, pharmaceutically suitable carriers or solvents.

Preferably, however, the medicament combinations according to the invention are administered by inhalation by means of a single preparation containing active substances **1**, **2** and **3** or by means of separate preparations each containing only one or two of the active substances **1**, **2** and **3**, suitable for administration by inhalation.

Inhalable preparations include inhalable powders, propellant-containing metered dose aerosols or propellant-free inhalable solutions. Inhalable powders according to the invention containing the combination of active substances **1**, **2** and **3** may consist of the active substances on their own or of a mixture of the active substances with physiologically acceptable excipients. Within the scope of the present invention, the term propellant-free inhalable solutions also includes concentrates or sterile inhalable solutions ready for use. The preparations according to the invention may contain the combination of active substances **1**, **2** and **3** either together in one formulation or in two separate formulations. These formulations which may be used within the scope of the present invention are described in more detail in the next part of the specification.

A) Inhalable powder containing the combinations according to the invention:

The inhalable powders according to the invention may contain **1**, **2** and **3** either on their own or in admixture with suitable physiologically acceptable excipients. If the active substances **1**, **2** and **3** are present in admixture with physiologically acceptable excipients, the following physiologically acceptable excipients may be used to prepare these inhalable powders according to the invention: monosaccharides (e.g. glucose or arabinose), disaccharides (e.g. lactose, saccharose, maltose, trehalose), oligo- and polysaccharides (e.g. dextrans), polyalcohols (e.g. sorbitol, mannitol, xylitol), salts (e.g. sodium chloride, calcium carbonate) or mixtures of these excipients with one another. Preferably, mono- or disaccharides are used, while the use of lactose, trehalose or glucose is preferred, particularly, but not exclusively, in the form of their hydrates.

Within the scope of the inhalable powders according to the invention the excipients have a maximum average particle size of up to 250μm, preferably between 10 and 150μm, most preferably between 15 and 80μm. It may sometimes seem appropriate to add finer excipient fractions with an average particle size of 1 to 9μm to the excipients mentioned above. These finer excipients are also selected from the group of possible excipients listed hereinbefore. Finally, in order to prepare the inhalable powders according to the invention, micronised active substance **1**, **2** and **3**, preferably with an average particle size of 0.5 to 10μm, more preferably from 1 to 6μm, is added to the excipient mixture. Processes for producing the inhalable powders according to the invention by grinding and micronising and finally mixing the ingredients together are known from the prior art. The inhalable powders according to the invention may be prepared and administered either in the form of

a single powder mixture which contains **1**, **2** and **3** or in the form of separate inhalable powders which contain only one or two of the active ingredients **1**, **2** and **3**.

The inhalable powders according to the invention may be administered using inhalers known from the prior art. Inhalable powders according to the invention which contain a physiologically acceptable excipient in addition to **1**, **2** and **3** may be administered, for example, by means of inhalers which deliver a single dose from a supply using a measuring chamber as described in US 4570630A, or by other means as described in DE 36 25 685 A. The inhalable powders according to the invention which contain **1**, **2** and **3** optionally in conjunction with a physiologically acceptable excipient may be administered, for example, using the inhaler known by the name Turbuhaler® or using inhalers as disclosed for example in EP 237507 A. Preferably, the inhalable powders according to the invention which contain physiologically acceptable excipient in addition to **1**, **2** and **3** are packed into capsules (to produce so-called inhalettes) which are used in inhalers as described, for example, in WO 94/28958.

A particularly preferred inhaler for using the pharmaceutical combination according to the invention in capsules is shown in Figure 1.

This inhaler (Handihaler®) for inhaling powdered pharmaceutical compositions from capsules is characterised by a housing 1 containing two windows 2, a deck 3 in which there are air inlet ports and which is provided with a screen 5 secured by a screen housing 4, an inhalation chamber 6 connected to the deck 3 on which there is a push button 9 provided with two sharpened pins 7 and movable counter to a spring 8, and a mouthpiece 12 which is connected to the housing 1, the deck 3 and a cover 11 via a spindle 10 to enable it to be flipped open or shut, and air through-holes 13 for adjusting the flow resistance.

If the inhalable powders according to the invention are to be packaged in capsules, in accordance with the preferred method of administration described above, the capsules should preferably contain from 1 to 30 mg each. According to the invention they contain either together or separately the dosages per single dose specified for **1**, **2** and **3** hereinbefore.

B) Propellant gas-driven inhalation aerosols containing the combinations according to the invention:

Inhalation aerosols containing propellant gas according to the invention may contain substances **1**, **2** and **3** dissolved in the propellant gas or in dispersed form. **1**, **2** and **3** may be present in separate formulations or in a single preparation, in which **1**, **2** and **3** are either all dissolved, all dispersed or only one or two of the components are dissolved and the others are dispersed. The propellant gases which may be used to prepare the inhalation aerosols according to the invention are known from the prior art. Suitable propellant gases are selected from among hydrocarbons such as n-propane, n-butane or isobutane and halohydrocarbons such as preferably chlorinated and fluorinated derivatives of methane, ethane, propane, butane, cyclopropane or cyclobutane. The propellant gases mentioned above may be used on their own or in mixtures thereof. Particularly preferred propellant gases are halogenated alkane derivatives selected from TG11, TG12, TG134a (1,1,1,2-tetrafluoroethane), TG227 (1,1,1,2,3,3,3-heptafluoropropane) and mixtures thereof, the propellant gases TG134a, TG227 and mixtures thereof being preferred.

The propellant-driven inhalation aerosols according to the invention may also contain other ingredients such as co-solvents, stabilisers, surfactants, antioxidants, lubricants and pH adjusters. All these ingredients are known in the art.

The inhalation aerosols containing propellant gas according to the invention may contain up to 5 wt.-% of active substance **1**, **2** and/or **3**. Aerosols according to the invention contain, for example, 0.002 to 5 wt.-%, 0.01 to 3 wt.-%, 0.015 to 2 wt.-%, 0.1 to 2 wt.-%, 0.5 to 2 wt.-% or 0.5 to 1 wt.-% of active substance **1**, **2** and/or **3**.

If the active substances **1**, **2** and/or **3** are present in dispersed form, the particles of active substance preferably have an average particle size of up to 10 µm, preferably from 0.1 to 6 µm, more preferably from 1 to 5 µm.

The propellant-driven inhalation aerosols according to the invention mentioned above may be administered using inhalers known in the art (MDIs = metered dose inhalers). Accordingly, in another aspect, the present invention relates to pharmaceutical compositions in the form of propellant-driven aerosols as hereinbefore described combined with one or more inhalers suitable for administering these aerosols. In addition, the present invention relates to inhalers which are characterised in that they contain the propellant gas-containing aerosols described above according to the invention.

The present invention also relates to cartridges which are fitted with a suitable valve and can be used in a suitable inhaler and which contain one of the above-mentioned propellant gas-containing inhalation aerosols according to the invention. Suitable cartridges and methods of filling these cartridges with the inhalable aerosols containing propellant gas according to the invention are known from the prior art.

C) Propellant-free inhalable solutions or suspensions containing the combinations of according to the invention:

Propellant-free inhalable solutions according to the invention contain for example aqueous or alcoholic, preferably ethanolic solvents, possibly ethanolic solvents in admixture with aqueous solvents. In the case of aqueous/ethanolic solvent mixtures the relative proportion of ethanol to water is not restricted, but the maximum limit is up to 70 percent by volume, more particularly up to 60 percent by volume of ethanol. The remainder of the volume is made up of water. The solutions or suspensions containing **1** and **2**, separately or together, are adjusted to a pH of 2 to 7, preferably 2 to 5, using suitable acids. The pH may be adjusted using acids selected from inorganic or organic acids. Examples of particularly suitable inorganic acids include hydrochloric acid, hydrobromic acid, nitric acid, sulphuric acid and/or phosphoric acid. Examples of particularly suitable organic acids include ascorbic acid, citric acid, malic acid, tartaric acid, maleic acid, succinic acid, fumaric acid, acetic acid, formic acid and/or propionic acid, etc. Preferred inorganic acids are hydrochloric acid and sulphuric acid. It is also possible to use the acids which have already formed an acid addition salt with one of the active substances. Of the organic acids, ascorbic acid, fumaric acid and citric acid are preferred. If desired, mixtures of the above acids may also be used, particularly in the case of acids which have other properties in addition to their acidifying qualities, e.g. as flavourings, antioxidants or complexing agents, such as citric acid or ascorbic acid, for example. According to the invention, it is particularly preferred to use hydrochloric acid to adjust the pH.

According to the invention, the addition of edetic acid (EDTA) or one of the known salts thereof, sodium edetate, as stabiliser or complexing agent is unnecessary in the present formulation. Other embodiments may contain this compound or these compounds. In a preferred embodiment the content based on sodium edetate is less than 100mg/100ml, preferably less than 50mg/100 ml, more preferably less than 20mg/ 100 ml. Generally, inhalable solutions in which the content of sodium edetate is from 0 to 10mg/100ml are preferred.

Co-solvents and/or other excipients may be added to the propellant-free inhalable solutions according to the invention. Preferred co-solvents are those which contain hydroxyl groups or other polar groups, e.g. alcohols - particularly isopropyl alcohol, glycols - particularly propyleneglycol, polyethyleneglycol, polypropyleneglycol, glycolether, glycerol, polyoxyethylene alcohols and polyoxyethylene fatty acid esters. The terms excipients and additives in this context denote any pharmacologically acceptable substance which is not an active substance but which can be formulated with the active substance or substances in the pharmacologically suitable solvent in order to improve the qualitative properties of the active substance formulation. Preferably, these substances have no pharmacological effect or, in connection with the desired therapy, no appreciable or at least no undesirable pharmacological effect. The excipients and additives include, for example, surfactants such as soya lecithin, oleic acid, sorbitan esters, such as polysorbates, polyvinylpyrrolidone, other stabilisers, complexing agents, antioxidants and/or preservatives which guarantee or prolong the shelf life of the finished pharmaceutical formulation, flavourings, vitamins and/or other additives known in the art. The additives also include pharmacologically acceptable salts such as sodium chloride as isotonic agents.

The preferred excipients include antioxidants such as ascorbic acid, for example, provided that it has not already been used to adjust the pH, vitamin A, vitamin E, tocopherols and similar vitamins and provitamins occurring in the human body.

Preservatives may be used to protect the formulation from contamination with pathogens. Suitable preservatives are those which are known in the art, particularly cetyl pyridinium chloride, benzalkonium chloride or benzoic acid or benzoates such as sodium benzoate in the concentration known from the prior art. The preservatives mentioned above are preferably present in concentrations of up to 50mg/100ml, more preferably between 5 and 20mg/100ml.

Preferred formulations contain, in addition to the solvent water and the combination of active substances **1**, **2** and **3** only benzalkonium chloride and sodium edetate. In another preferred embodiment, no sodium edetate is present.

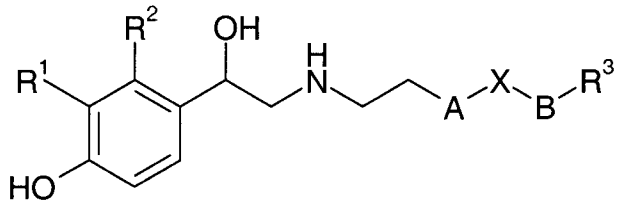
The propellant-free inhalable solutions according to the invention are administered in particular using inhalers of the kind which are capable of nebulising a small amount of a liquid formulation in the therapeutic dose within a few seconds to produce an aerosol

suitable for therapeutic inhalation. Within the scope of the present invention, preferred inhalers are those in which a quantity of less than 100µL, preferably less than 50µL, more preferably between 10 and 30µL of active substance solution can be nebulised in preferably one spray action to form an aerosol with an average particle size of less than 20µm, preferably less than 10µm, such that the inhalable part of the aerosol corresponds to the therapeutically effective quantity.

An apparatus of this kind for propellant-free delivery of a metered quantity of a liquid pharmaceutical composition for inhalation is described for example in International Patent Application WO 91/14468 and also in WO 97/12687 (cf. in particular Figures 6a and 6b). The nebulisers (devices) described therein are known by the name Respimat®.

Patent Claims

1) Medicament combinations which contain in addition to one or more, preferably one, compound of general formula **1**



1

wherein

A denotes phenylen or -C_1-C_5-alkylen;

B denotes a group selected from a single bond, phenylen, -C_1-C_5-alkylen and -C_1-C_3-alkylen-O-C_1-C_3-alkylen which is optionally substituted by OH or -O-C_1-C_4-alkyl;

X denotes -NH- or -O-;

R^1 denotes -CH_2-OH, or -NH-CHO;

R^2 denotes hydrogen, or

R^1 and R^2 together -NH-CO-CH=CH-

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among -C_1-C_4-alkyl, halogen, -O-C_1-C_4-alkyl, -O-C_1-C_4-alkylene-NH_2, -SO_2NH_2, -NH-CO-NH_2, -SO_2-C_1-C_5-alkyl and -SO_2-C_3-C_6-cycloalkyl,

at least one anticholinergic **2** and at least one steroid **3** and optionally a pharmaceutically acceptable carrier.

2) Medicament combinations according to claim 1 which contain in addition to one or more, preferably one, compound of general formula **1**, wherein

A denotes phenylen, -CH_2-CH_2-CH_2-CH_2- or -CH_2-CH_2-CH_2-CH_2-CH_2-;

B denotes a group selected from phenylen, -CH_2-CH_2-, -CH_2-CH_2-CH_2-, -CH_2-CH_2-CH_2-CH_2- and -CH_2-CH_2-O-CH_2- which is optionally substituted by OH or -O-CH_3;

X denotes -NH- or -O-;

R^1 denotes -CH_2-OH, or -NH-CHO;

R^2 denotes hydrogen, or

R^1 and R^2 together denote -NH-CO-CH=CH-

R^3 denotes phenyl which is optionally substituted by one or two groups selected from among $-CH_3$, Cl, $-O-CH_2-C(CH_3)_2-NH_2$, $-SO_2NH_2$, $-NH-CO-NH_2$ and $-SO_2$-cyclopentyl;

at least one anticholinergic **2** and at least one steroid **3** and optionally a pharmaceutically acceptable carrier.

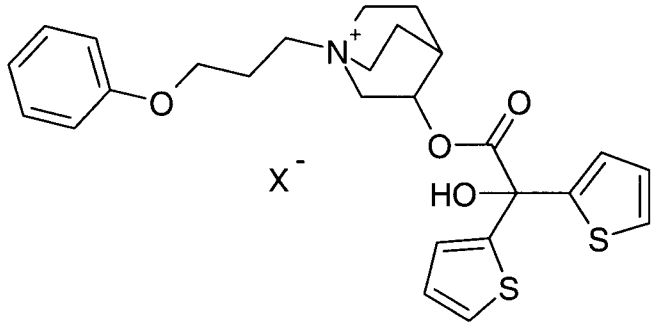
3) Medicament combinations according to one of claims 1 or 2, which contain one or more compounds of general formula **1** in the form of the individual optical isomers, mixtures of the individual enantiomers or racemates.

4) Medicament combinations according to one of claims 1 to 3, which contain one or more compounds of general formula **1** in the form of the acid addition salts with pharmacologically acceptable acids as well as optionally in the form of the solvates and/or hydrates.

5) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from among the tiotropium salts (**2.1**), oxitropium salts (**2.2**), flutropium salts (**2.3**), ipratropium salts (**2.4**), glycopyrronium salts (**2.5**) and trospium salts (**2.6**).

6) Medicament combinations according to claim 5 wherein the salts are seleceted from among chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate.

7) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from the salts of formula **2.7**



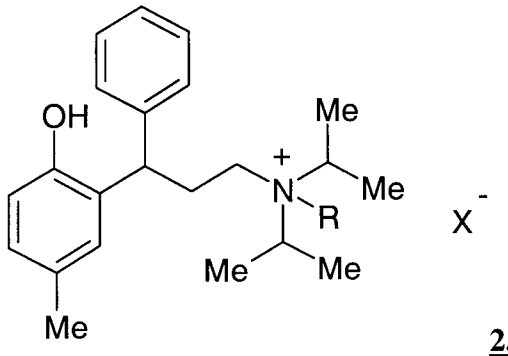
2.7

wherein

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

optionally in the form of the racemates, enantiomers or hydrates thereof.

8) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from the salts of formula **2.8**



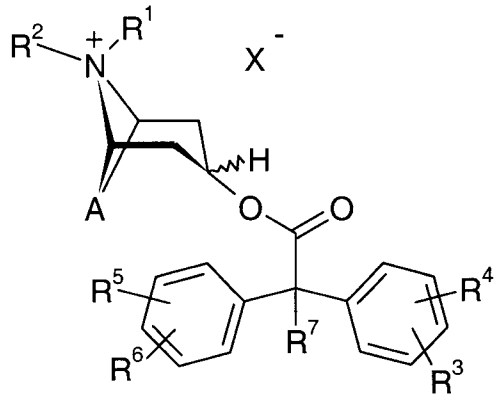
2.8

wherein R denotes either methyl or ethyl and wherein

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

optionally in the form of the racemates, enantiomers or hydrates thereof.

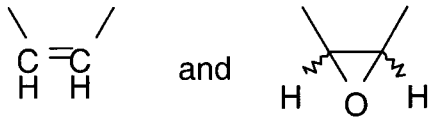
9) Medicament combinations according to one of claims 1 to 4 wherein the the anticholinergic **2** is selected from the compounds of formula **2.9**



2.9

wherein

A denotes a double-bonded group selected from the groups



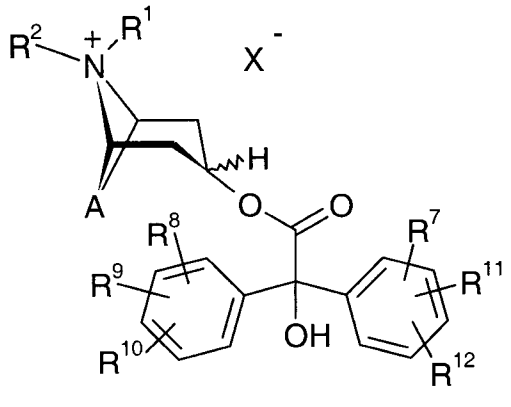
X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

R^1 and R^2 which may be identical or different, denote methyl or ethyl, preferably methyl;

R^3, R^4, R^5 and R^6, which may be identical or different, denote hydrogen, methyl, methyloxy, chlorine or fluorine;

R^7 denotes hydrogen, methyl or fluorine.

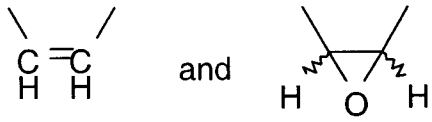
10) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from the compounds of formula **2.10**



2.10

wherein

A denotes a double-bonded group selected from the groups

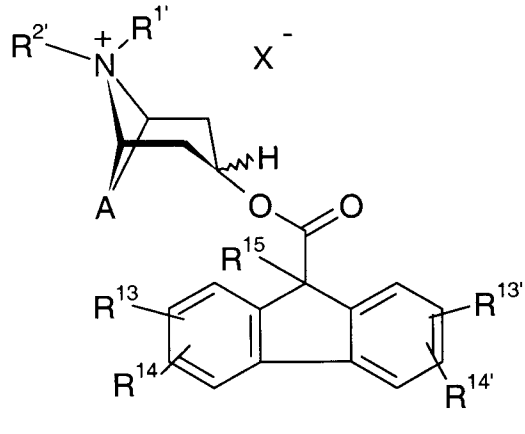


X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

R^1 and R^2 which may be identical or different, denote methyl or ethyl, preferably methyl;

R^7, R^8, R^9, R^{10}, R^{11} and R^{12}, which may be identical or different, denote hydrogen, fluorine, chlorine or bromine, preferably fluorine, while at least one of the groups R^7, R^8, R^9, R^{10}, R^{11} and R^{12} may not be hydrogen.

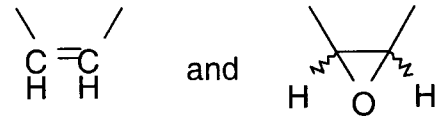
11) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** contained is selected from the compounds of formula **2.11**



2.11

wherein

A denotes a double-bonded group selected from the groups



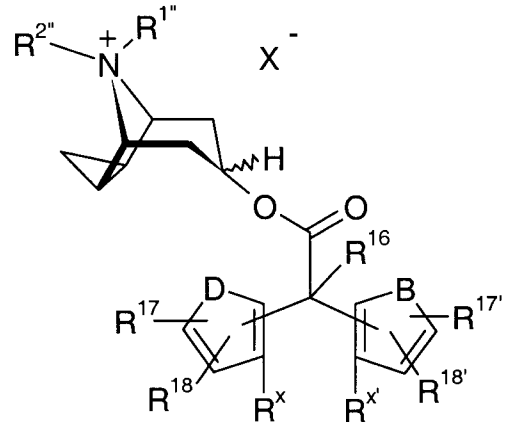
X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

R^{15} denotes hydroxy or methyl, preferably methyl;

$R^{1'}$ and $R^{2'}$ which may be identical or different, denote methyl or ethyl, preferably methyl;

R^{13}, R^{14}, $R^{13'}$ and $R^{14'}$ which may be identical or different, denote hydrogen or fluorine.

12) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from the compounds of formula **2.12**



2.12

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

D and B which may be identical or different, preferably identical, denote S or CH=CH;

R^{16} denotes hydrogen, hydroxy or methyl;

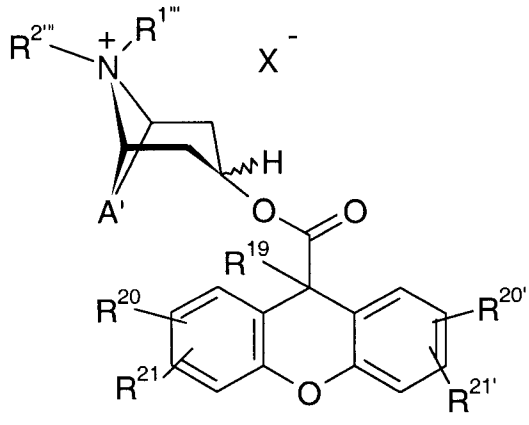
$R^{1''}$ and $R^{2''}$ which may be identical or different, denote methyl or ethyl;

R^{17}, R^{18}, $R^{17'}$ and $R^{18'}$, which may be identical or different, denote hydrogen, $-CF_3$ or fluorine, preferably hydrogen;

R^X and $R^{X'}$ which may be identical or different, denote hydrogen, $-CF_3$ or fluorine, preferably hydrogen, or

R^X and $R^{X'}$ together denote a single bond or -O.

13) Medicament combinations according to one of claims 1 to 4 wherein the anticholinergic **2** is selected from the compounds of formula **2.13**



2.13

X^- denotes an anion with a single negative charge, preferably an anion selected from among the fluoride, chloride, bromide, iodide, sulphate, phosphate, methanesulphonate, nitrate, maleate, acetate, citrate, fumarate, tartrate, oxalate, succinate, benzoate and p-toluenesulphonate,

A' denotes a double-bonded group selected from



;

R^{19} denotes hydroxy or methyl, preferably methyl;

$R^{1'''}$ and $R^{2'''}$ which may be identical or different, denote methyl or ethyl, preferably methyl;

R^{20}, R^{21}, $R^{20'}$ and $R^{21'}$ which may be identical or different, denote hydrogen or fluorine.

14) Medicament combinations according to one of claims 1 to 13 wherein the steroid **3** is selected from among prednisolone (**3.1**), prednisone (**3.2**), butixocortpropionate (**3.3**), RPR-106541 (**3.4**), flunisolide (**3.5**), beclomethasone (**3.6**), triamcinolone (**3.7**), budesonide (**3.8**), fluticasone (**3.9**), mometasone (**3.10**), ciclesonide (**3.11**), rofleponide (**3.12**), ST-126 (**3.13**), dexamethasone (**3.14**), (S)-fluoromethyl 6α,9α-difluoro-17α-[(2-furanylcarbonyl)oxy]-11β-hydroxy-16α-methyl-3-oxo-androsta-1,4-diene-17β-carbothionate (**3.15**), (S)-(2-oxo-tetrahydro-furan-3S-yl)6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-propionyloxy-androsta-1,4-diene-17β-carbothionate (**3.16**), etiprednol-dichloroacetate (BNP-166, **3.17**) and 6α,9α-difluoro-11β-hydroxy-16α-methyl-3-oxo-17α-(2,2,3,3-tertamethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17β-carboxylic acid cyanomethyl ester (**3.18**), optionally in the form of the racemates, enantiomers or diastereomers thereof and optionally in the form of the salts and derivatives thereof, the solvates and/or hydrates thereof.

15) Medicament combinations according to one of claims 1 to 14, characterised in that they also contain, in addition to therapeutically effective amounts of **1**, **2** and **3** , a pharmaceutically acceptable carrier.

16) Pharmaceutical combination according to one of claims 1 to 15, characterised in that it is in the form of a formulation suitable for inhalation.

17) Pharmaceutical combination according to claim 16, characterised in that it is a preparation selected from the group comprising inhalable powders, propellant-driven metered-dose aerosols and propellant-free inhalable solutions or suspensions.

18) Pharmaceutical combination according to claim 17, characterised in that the preparation is an inhalable powder which contains **1**, **2** and **3** in admixture with suitable physiologically acceptable excipients selected from the group comprising monosaccharides, disaccharides, oligo- and polysaccharides, polyalcohols, salts, or mixtures of these excipients with one another.

19) Pharmaceutical combination according to claim 17, characterised in that the preparation is a propellant-drive inhalable aerosol which contains **1**, **2** and **3** in dissolved or dispersed form.

20) Pharmaceutical combination according to claim 19, characterised in that the inhalable aerosol contains as the propellant gas hydrocarbons such as n-propane, n-butane or isobutane or halohydrocarbons such as chlorinated and/or fluorinated derivatives of methane, ethane, propane, butane, cyclopropane or cyclobutane.

21) Pharmaceutical combination according to claim 20, characterised in that the propellant gas is TG11, TG12, TG134a, TG227 or mixtures thereof, preferably TG134a, TG227 or a mixture thereof.

22) Pharmaceutical combination according to claim 17, characterised in that the preparation is a propellant-free inhalable solution or suspension which contains as solvent water, ethanol or a mixture of water and ethanol.

23) Use of a pharmaceutical combination according to one of claims 1 to 22 for preparing a pharmaceutical composition for the treatment of inflammatory and obstructive respiratory complaints, for inhibiting premature labour in midwifery (tocolysis), for restoring sinus rhythm in the heart in atrioventricular block, for correcting bradycardic heart rhythm disorders (antiarrhythmic), for treating circulatory shock (vasodilatation and increasing the heart volume) as well as for the treatment of skin irritations and inflammation.

24) Use according to claim 23, for preparing a pharmaceutical composition for the treatment of respiratory complaints selected from the group comprising obstructive pulmonary diseases of various origins, pulmonary emphysema of various origins, restrictive pulmonary diseases, interstitial pulmonary diseases, cystic fibrosis, bronchitis of various origins, bronchiectasis, ARDS (adult respiratory distress syndrome) and all forms of pulmonary oedema.

25) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of obstructive pulmonary diseases selected from among bronchial asthma, paediatric asthma, severe asthma, acute asthma attacks, chronic bronchitis and COPD (chronic obstructive pulmonary disease), while it is particularly preferable according to the invention to use them for preparing a pharmaceutical composition for the treatment of bronchial asthma and COPD.

26) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of pulmonary emphysema which has its origins in COPD or α1-proteinase inhibitor deficiency.

27) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of restrictive pulmonary diseases selected from among allergic alveolitis, restrictive pulmonary diseases triggered by work-related noxious substances, such as asbestosis or silicosis, and restriction caused by lung tumours, such as for example lymphangiosis carcinomatosa, bronchoalveolar carcinoma and lymphomas.

28) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of interstitial pulmonary diseases selected from among pneumonia caused by infections, such as for example infection by viruses, bacteria, fungi, protozoa, helminths or

other pathogens, pneumonitis caused by various factors, such as for example aspiration and left heart insufficiency, radiation-induced pneumonitis or fibrosis, collagenoses, such as for example lupus erythematodes, systemic sclerodermy or sarcoidosis, granulomatoses, such as for example Boeck's disease, idiopathic interstitial pneumonia or idiopathic pulmonary fibrosis (IPF).

29) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of cystic fibrosis or mucoviscidosis.

30) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of bronchitis, such as bronchitis caused by bacterial or viral infection, allergic bronchitis and toxic bronchitis.

31) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of bronchiectasis.

32) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of ARDS (adult respiratory distress syndrome).

33) Use according to claim 24, for preparing a pharmaceutical composition for the treatment of pulmonary oedema.

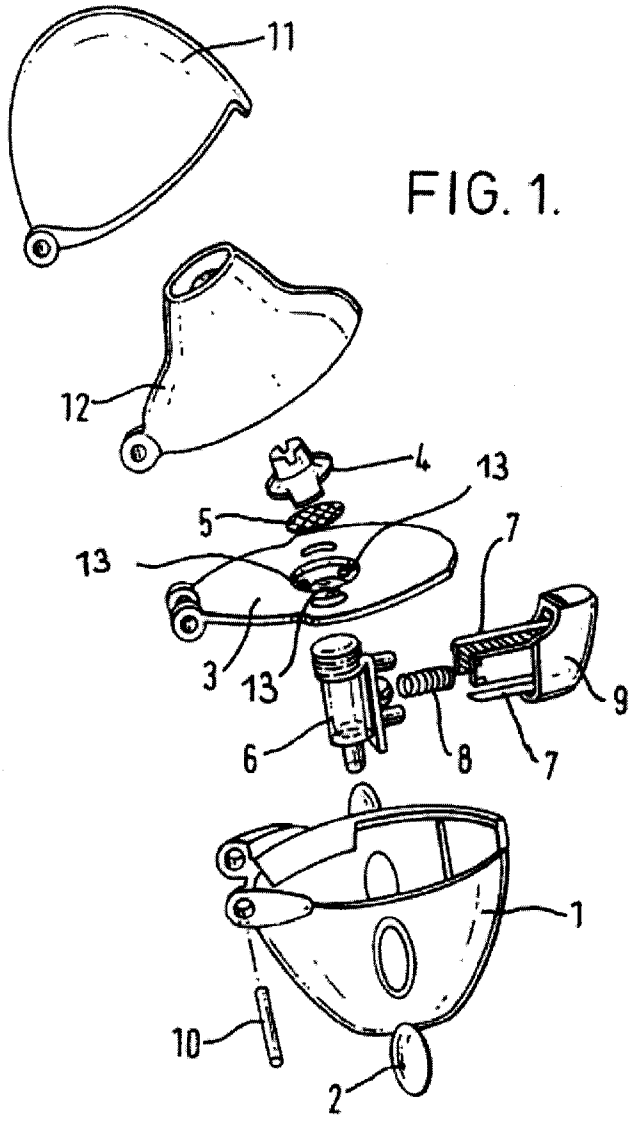


FIG. 1.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/054487

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K31/075 A61K31/17 A61K31/18 A61K31/435 A61K31/56
A61P11/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, CHEM ABS Data, BEILSTEIN Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/034776 A1 (PIEPER MICHAEL P [DE] ET AL) 16 February 2006 (2006-02-16) paragraph [0004] - paragraph [0017] paragraph [0029] paragraph [0033] - paragraph [0037] claims 1-23	1-6,11, 14-25, 27-33
X	WO 2004/019985 A (CIPLA LTD [IN]; LULLA AMAR [IN]; MALHOTRA GEENA [IN]; WAIN CHRISTOPHER) 11 March 2004 (2004-03-11) claims 1,8-23,29,30	1-6, 14-18, 20-25

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 August 2007	31/08/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Damiani, Federica

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/054487

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/000241 A (BOEHRINGER INGELHEIM PHARMA [DE]; MEADE CHRISTOPHER JOHN MONTAGU [DE];) 3 January 2003 (2003-01-03) page 1 - page 3 page 5 page 12 - page 14 page 15, line 11 - line 20	1-6, 14-27,29
X	DE 10 2004 038886 A1 (BOEHRINGER INGELHEIM PHARMA [DE]) 23 February 2006 (2006-02-23) claims 1-7,11-24	1-6,11, 14-21, 23-25
X	US 2005/042174 A1 (NILSSON THOMAS [SE] ET AL) 24 February 2005 (2005-02-24) paragraph [0051] - paragraph [0052]	1-6, 14-17, 23,25
X,P	WO 2006/114379 A (BOEHRINGER INGELHEIM INT [DE]; BOEHRINGER INGELHEIM PHARMA [DE]; KONET) 2 November 2006 (2006-11-02) page 1 - page 6 page 20 - page 22 page 45, line 1 - line 11 column 1 - column 13	1-7,9, 11-33
X,P	WO 2006/105401 A (SCHERING CORP [US]; SEQUEIRA JOEL A [US]; YANG TSONG-TOH [US]) 5 October 2006 (2006-10-05) claims 1-19,32	1-6, 14-20, 22,23
P,X	WO 2006/056527 A (BOEHRINGER INGELHEIM INT [DE]; BOEHRINGER INGELHEIM PHARMA [DE]; PIEPE) 1 June 2006 (2006-06-01) page 1 - page 2 claims 1-11	1-6,9, 14-25
A	CA 2 527 178 A1 (BOEHRINGER INGELHEIM INT [DE]) 9 December 2004 (2004-12-09) page 1	1-33
A	WO 03/035599 A (UPJOHN CO [US]; RICHARDS IVAN [US]; CAMMARATA SUE K [US]; WEGNER CRAIG) 1 May 2003 (2003-05-01) page 4 - page 5 page 7 page 21, line 7 - line 13	1-33
A	US 2003/158176 A1 (RICHARDS IVAN [US] ET AL) 21 August 2003 (2003-08-21) paragraph [0093] examples 2-4	1-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/054487

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006034776 A1	16-02-2006	CA 2573370 A1	23-02-2006
		EP 1778227 A1	02-05-2007
		WO 2006018391 A1	23-02-2006
WO 2004019985 A	11-03-2004	AU 2003260754 A1	19-03-2004
		CA 2496699 A1	11-03-2004
		EP 1531866 A1	25-05-2005
		JP 2005539046 T	22-12-2005
		US 2006035874 A1	16-02-2006
WO 03000241 A	03-01-2003	AU 2002316935 A1	08-01-2003
		CA 2455167 A1	03-01-2003
		DE 10130371 A1	02-01-2003
		EP 1408967 A2	21-04-2004
		JP 2005502608 T	27-01-2005
		MX PA03011515 A	18-03-2004
DE 102004038886 A1	23-02-2006	NONE	
US 2005042174 A1	24-02-2005	NONE	
WO 2006114379 A	02-11-2006	US 2006239908 A1	26-10-2006
WO 2006105401 A	05-10-2006	NONE	
WO 2006056527 A	01-06-2006	CA 2582207 A1	01-06-2006
		DE 102004056579 A1	24-05-2006
		US 2006110329 A1	25-05-2006
CA 2527178 A1	09-12-2004	DE 10323966 A1	16-12-2004
		EP 1631287 A2	08-03-2006
		WO 2004105759 A2	09-12-2004
		JP 2007500194 T	11-01-2007
WO 03035599 A	01-05-2003	BR 0206207 A	23-12-2003
		CA 2464223 A1	01-05-2003
		EP 1461306 A1	29-09-2004
		JP 2005524605 T	18-08-2005
		MX PA04003865 A	08-07-2004
		NO 20032938 A	25-08-2003
US 2003158176 A1	21-08-2003	US 2005148672 A1	07-07-2005