International Nonproprietary Names for Pharmaceutical Substances

In accordance with article 3 of the Procedure for the Selection of Recommended International Nonproprietary Names for Pharmaceutical Substances,[1] notice is hereby given that the following names are under consideration by the World Health Organization as Proposed International Nonproprietary Names.

Comments on, or formal objections to, the proposed names may be forwarded by any person to the Pharmaceuticals unit of the World Health Organization within four months of the date of their publication in *WHO Drug Information*, e.g., for List 59 Prop. INN not later than 31 December 1988.

The inclusion of a name in the lists of proposed international nonproprietary names does not imply any recommendation for the use of the substance in medicine or pharmacy.

Action and Use

The statements in italics indicating the action and use are based largely on information supplied by the manufacturer. The information is meant to provide an indication of the potential use of new substances at the time they are accorded proposed INNs. WHO is not in a position either to uphold these statements or to comment on the efficacy of the action claimed. Because of their provisional nature these descriptors will not be included in the Cumulative Lists of INNs.

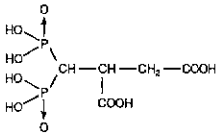
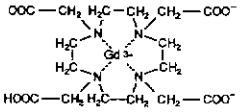
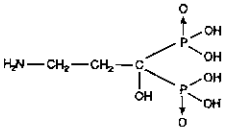
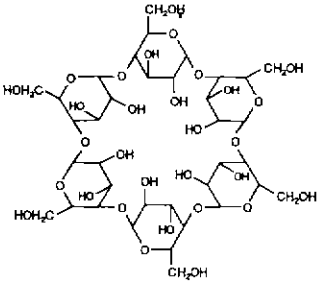
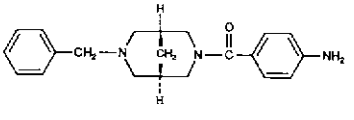
Proposed International Nonproprietary Names (Prop. INN): List 59[2]

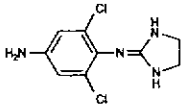
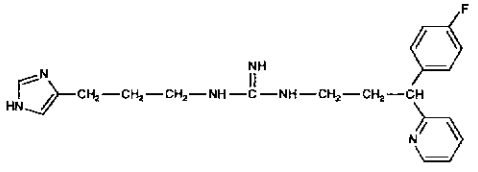
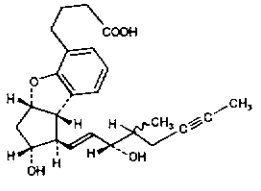
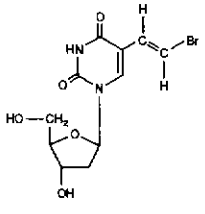
Comprehensive information on the INN programme can be found in: WHO Technical Report Series, No. 581, 1975 (*Nonproprietary Names for Pharmaceutical Substances.* Twentieth Report of the WHO Expert Committee), ISBN 92 4 120581 4 (price: Sw. fr. 6–); an account of this publication will be found in Annex 2 of the present List. All names from Lists 1–47 of Proposed International Nonproprietary Names, together with a molecular formula index, will be found in: *International Nonproprietary Names (INN) for Pharmaceutical Substances. Cumulative List No. 6,* 1982, World Health Organization, Geneva (ISBN 92 4 056013 0) (price: Sw. fr. 55.–) This publication consists, in the main, of a computer printout which groups together all the proposed and recommended international nonproprietary names (INN)—in Latin, English, French, Russian, and Spanish—published up to April 1982. The printout also indicates in which of the 47 individual lists of proposed names and 21 lists of recommended names each INN was originally published, and gives references to national nonproprietary names, pharmacopoeia monographs, and other sources. In addition, the list contains molecular formulae and Chemical Abstracts Service registry numbers. For easy reference, national nonproprietary names that differ from INN, molecular formulae, and Chemical Abstracts Service registry numbers are indexed in a series of annexes. A final annex describes the procedure for selecting recommended INN and outlines the general principles to be followed in devising these names. All the textual material published in this volume appears in both English and French.

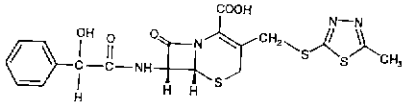
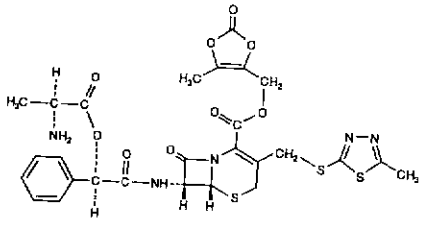
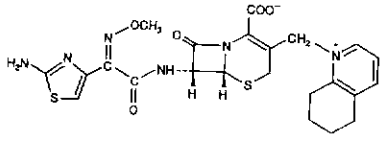
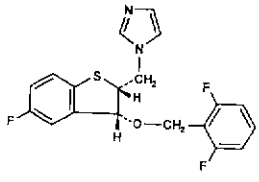
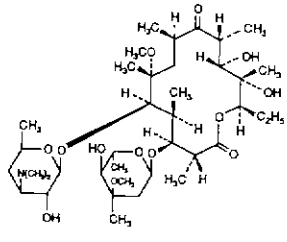
These publications may be obtained, direct or through booksellers, from the sales agents listed on the back cover of *WHO Drug Information*. Orders from countries where sales agents have not yet been appointed may be addressed to: World Health Organization, Distribution and Sales Service, 1211 Geneva 27, Switzerland.

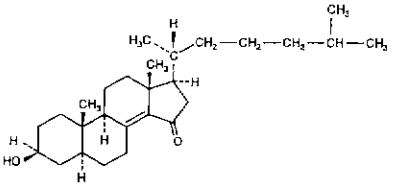
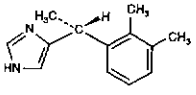
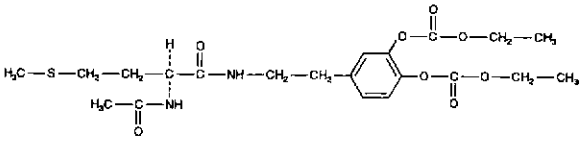
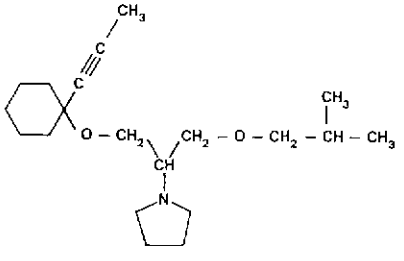
[1] Text adopted by the Executive Board of WHO in resolution EB15.R7 (*Off. Rec. Wld Hlth Org.*, 1955, **60**, 3) and amended by the Board in resolution EB43.R9 (*Off. Rec. Wld. Hlth Org.*, 1969, **173**, 10).

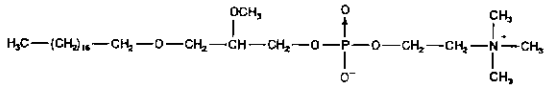
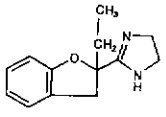
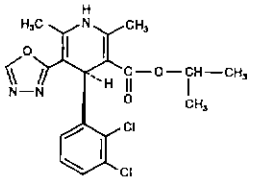
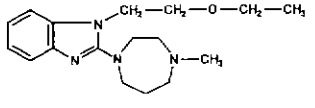
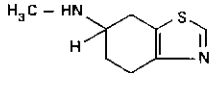
[2] Other lists of proposed and recommended international nonproprietary names can be found in *Cumulative List No. 6,* 1982.

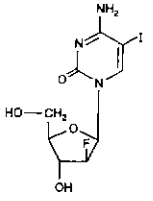
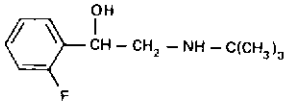
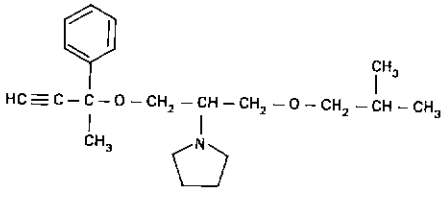
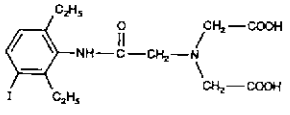
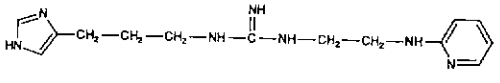
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) Registry Number* *Action and use*
acidum butedronicum butedronic acid	(diphosphonomethyl)succinic acid $C_5H_{10}O_{10}P_2$ 51395-42-7 *bone imaging agent* 
acidum gadotericum gadoteric acid	hydrogen [1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetato(4-)]-gadolinate(1-) $C_{16}H_{25}GdN_4O_8$ 72573-82-1 *paramagnetic contrast medium* 
acidum pamidronicum pamidronic acid	(3-amino-1-hydroxypropylidene)diphosphonic acid $C_3H_{11}NO_7P_2$ 40391-99-9 *inhibitor of tumor-induced hypercalcaemia* 
alfadexum alfadex	α-cyclodextrin $C_{36}H_{60}O_{30}$ 10016-20-3 
alteplasum alteplase	plasminogen activator (human tissue-type 2-chain form protein moiety) $C_{2736}H_{4174}N_{814}O_{824}S_{45}$ 105857-23-6
ambasilidum ambasilide	3-(*p*-aminobenzoyl)-7-benzyl-3,7-diazabicyclo[3.3.1]nonane $C_{21}H_{25}N_3O$ 83991-25-7 *antidysrhythmic* 

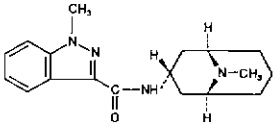
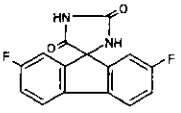
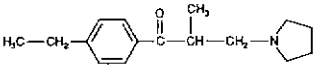
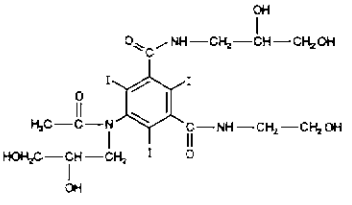
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
aminoacida amino acids	see general statement on nomenclature of amino acids under *amendments*
anistreplasum anistreplase	anisoylated (human) lys-plasminogen streptokinase activator complex (1 : 1) – 81669-57-0
apraclonidinum apraclonidine	2-[(4-amino-2,6-dichlorophenyl)imino]imidazolidine $C_9H_{10}Cl_2N_4$ 66711-21-5 *α_2-adrenoreceptor agonist* 
arpromidinum arpromidine	(±)-1-[3-(*p*-fluorophenyl)-3-(2-pyridyl)propyl]-3-(3-imidazol-4-ylpropyl)-guanidine $C_{21}H_{25}FN_6$ 106669-71-0 *histamine H_2-agonist* 
beraprostum beraprost	(±)-(1*R**,2*R**,3a*S**,8b*S**)-2,3,3a,8b-tetrahydro-2-hydroxy-1-[(*E*)-(3*S**)-3-hydroxy-4-methyl-1-octen-6-ynyl]-1*H*-cyclopenta[*b*]benzofuran-5-butyric acid $C_{24}H_{30}O_5$ 88430-50-6 *platelet aggregation inhibitor, vasodilator* 
brivudinum brivudine	(*E*)-5-(2-bromovinyl)-2′-deoxyuridine $C_{11}H_{13}BrN_2O_5$ 69304-47-8 *antiviral* 

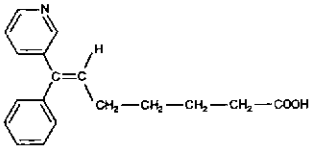
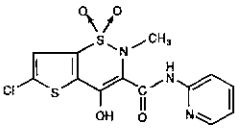
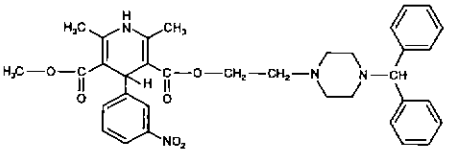
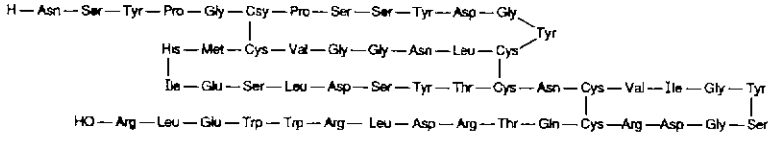
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
cefcanelum cefcanel	(6*R*,7*R*)-7-[(*R*)-mandelamido]-3-[[(5-methyl-1,3,4-thiadiazol-2-yl)thio]methyl]-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid $C_{19}H_{18}N_4O_5S_3$ 41952-52-7 *antibiotic* 
cefcanelum daloxatum cefcanel daloxate	2,3-dihydroxy-2-butenyl (6*R*,7*R*)-7-[(*R*)-mandelamido]-3-[[(5-methyl-1,3,4-thiadiazol-2-yl)thio]methyl]-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylate, cyclic 2,3-carbonate, ester with L-alanine $C_{27}H_{27}N_5O_9S_3$ 97275-40-6 *antibiotic* 
cefquinomum cefquinome	1-[[(6*R*,7*R*)-7-[2-(2-amino-4-thiazolyl)glyoxylamido]-2-carboxy-8-oxo-5-thia-1-azabicyclo[4.2.0.]oct-2-en-3-yl]methyl]-5,6,7,8-tetrahydroquinolinium hydroxide, inner salt, 7²-(*Z*)-(*O*-methyloxime) $C_{23}H_{24}N_6O_5S_2$ 84957-30-2 *antibiotic* 
cisconazolum cisconazole	(±)-*cis*-1-[[3-[(2,6-difluorobenzyl)oxy]-5-fluoro-2,3-dihydrobenzo[*b*]thien-2-yl]methyl]imidazole $C_{19}H_{15}F_3N_2OS$ 104456-79-3 *antifungal* 
clarithromycinum clarithromycin	6-*O*-methylerythromycin $C_{38}H_{69}NO_{13}$ 81103-11-9 *antibiotic* 

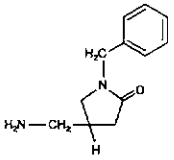
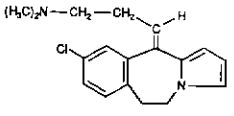
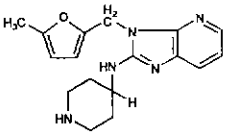
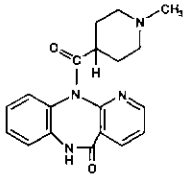
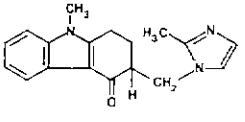
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
colestolonum colestolone	3β-hydroxy-5α-cholest-8(14)-en-15-one $C_{27}H_{44}O_2$ 50673-97-7 *hypolipidaemic* 
dexmedetomidinum dexmedetomidine	(+)-4-[(*R*)-α,2,3-trimethylbenzyl]imidazole $C_{13}H_{16}N_2$ 113775-47-6 *α_2-adrenoreceptor agonist* 
docarpaminum docarpamine	(−)-(*S*)-2-acetamido-*N*-(3,4-dihydroxyphenethyl)-4-(methylthio)butyramide bis(ethyl carbonate) (ester) $C_{21}H_{30}N_2O_8S$ 74639-40-0 *dopamine prodrug* 
dopropidilum dopropidil	1-[1-(isobutoxymethyl)-2-[[1-(1-propynyl)cyclohexyl]oxy]ethyl]pyrrolidine $C_{20}H_{35}NO_2$ 79700-61-1 *antianginal, anti-ischaemic* 
dumorelinum dumorelin	27-L-leucine-44a-glycinegrowth hormone-releasing factor (human) $C_{218}H_{362}N_{72}O_{68}$ 105953-59-1 H—Tyr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Ser—Tyr—Arg—Lys—Val—Leu—Gly— Gln—Leu—Ser—Ala—Arg—Lys—Leu—Leu—Gln—Asp—Ile—Leu—Ser—Arg—Gln— Gln—Gly—Glu—Ser—Asn—Gln—Glu—Arg—Gly—Ala—Arg—Ala—Arg—Leu—Gly—OH

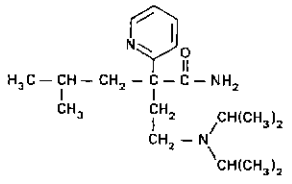
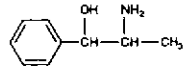
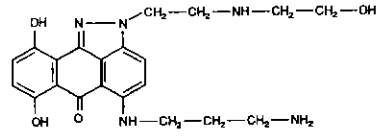
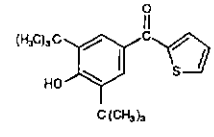
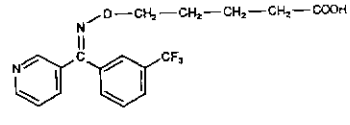
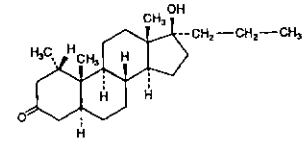
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
edelfosinum edelfosine	choline hydroxide, (±)-2-methoxy-3-(octadecyloxy)propyl hydrogen phosphate, inner salt or 2-*O*-methyl-1-*O*-octadecyl-*rac*-glycero-3-phosphocholine $C_{27}H_{58}NO_6P$ 70641-51-9 *antineoplastic* 
efaroxanum efaroxan	(±)-2-(2-ethyl-2,3-dihydro-2-benzofuranyl)-2-imidazoline $C_{13}H_{16}N_2O$ 89197-32-0 *α_2-adrenoreceptor antagonist* 
elnadipinum elnadipine	isopropyl (−)-(*S*)-4-(2,3-dichlorophenyl)-1,4-dihydro-2,6-dimethyl-5-(1,3,4-oxadiazol-2-yl)nicotinate $C_{19}H_{19}Cl_2N_3O_3$ 103946-15-2 *Calcium antagonist* 
emedastinum emedastine	1-(2-ethoxyethyl)-2-(hexahydro-4-methyl-1*H*-1,4-diazepin-1-yl)benzimidazole $C_{17}H_{26}N_4O$ 87233-61-2 *histamine antagonist* 
etrabaminum etrabamine	4,5,6,7-tetrahydro-6-(methylamino)benzothiazole $C_8H_{12}N_2S$ 70590-58-8 *antidepressant* 

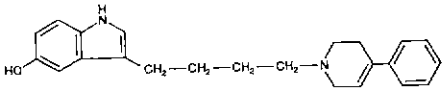
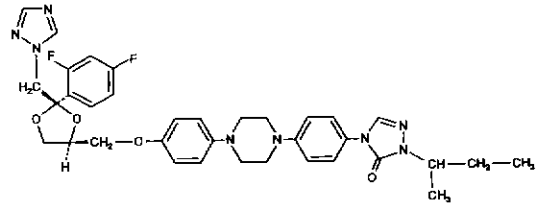
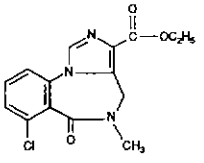
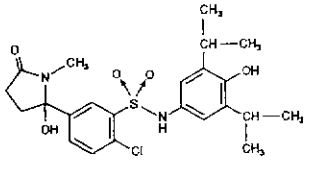
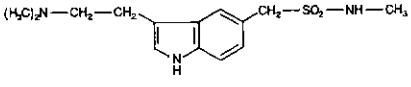
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
fiacitabinum fiacitabine	1-(2-deoxy-2-fluoro-β-D-arabinofuranosyl)-5-iodocytosine $C_9H_{11}FIN_3O_4$ 69123-90-6 *antiviral* 
flerobuterolum flerobuterol	α-[(*tert*-butylamino)methyl]-*o*-fluorobenzyl alcohol $C_{12}H_{18}FNO$ 82101-10-8 *β-adrenoreceptor agonist* 
fronedipilum fronedipil	1-[1-(isobutoxymethyl)-2-[(1-methyl-1-phenyl-2-propynyl)oxy]ethyl]pyrrolidine $C_{21}H_{31}NO_2$ 79700-63-3 *antidysrhythmic, anti-ischaemic* 
[illegible]ltifeninum [illegible]tifenin	[[[(2,6-diethyl-3-iodophenyl)carbamoyl]methyl]imino]diacetic acid $C_{16}H_{21}IN_2O_5$ 106719-74-8 *diagnostic aid* 
gapromidinum gapromidine	1-(3-imidazol-4-ylpropyl)-3-[2-(2-pyridylamino)ethyl]guanidine $C_{14}H_{21}N_7$ 106686-40-2 *histamine H_2-agonist* 

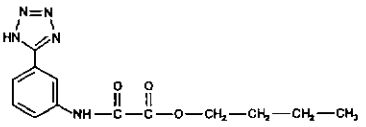
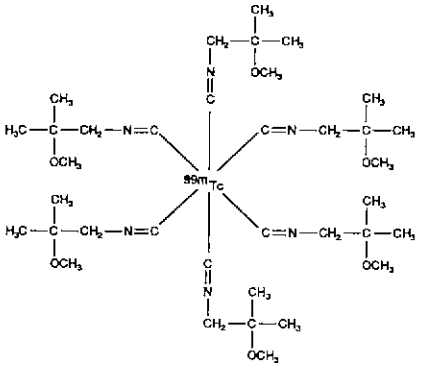
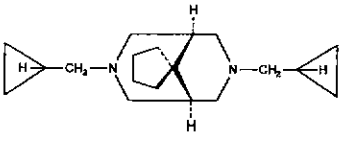
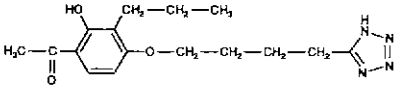
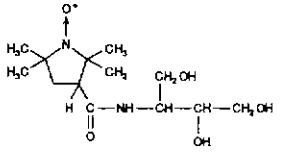
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
granisetronum granisetron	1-methyl-*N*-(*endo*-9-methyl-9-azabicyclo[3.3.1]non-3-yl)-1*H*-indazole-3-carboxamide $C_{18}H_{24}N_4O$ 109889-09-0 *serotonin antagonist* 
imirestatum imirestat	2,7-difluorospiro[fluorene-9,4′-imidazolidine]-2′,5′-dione $C_{15}H_8F_2N_2O_2$ 89391-50-4 *aldose reductase inhibitor* 
inaperisonum inaperisone	(±)-4′-ethyl-2-methyl-3-(1-pyrrolidinyl)propiophenone $C_{16}H_{23}NO$ 99323-21-4 *centrally acting muscle relaxant* 
ioxilanum ioxilan	*N*-(2,3-dihydroxypropyl)-5-[*N*-(2,3-dihydroxypropyl)acetamido]-*N*′-(2-hydroxyethyl)-2,4,6-triidoisophthalamide $C_{19}H_{24}I_3N_3O_8$ 107793-72-6 *contrast medium* 

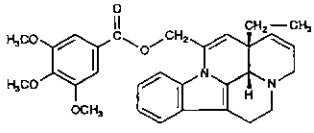
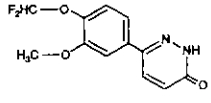
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
isbogrelum isbogrel	(*E*)-7-phenyl-7-(3-pyridyl)-6-heptenoic acid $C_{18}H_{19}NO_2$ 89667-40-3 *thromboxane A_2-synthetase inhibitor* 
lornoxicamum lornoxicam	6-chloro-4-hydroxy-2-methyl-*N*-2-pyridyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide 1,1-dioxide $C_{13}H_{10}ClN_3O_4S_2$ 70374-39-9 *nonsteroidal anti-inflammatory* 
manidipinum manidipine 6300	2-[4-(diphenylmethyl)-1-piperazinyl]ethyl methyl (±)-1,4-dihydro-2,6-dimethyl-4-(*m*-nitrophenyl)-3,5-pyridinedicarboxylate $C_{35}H_{38}N_4O_6$ 89226-50-6 *Calcium antagonist* 
murodermum murodermin	urogastrone (mouse salivary gland) or epidermal growth factor (mouse salivary gland) – 62229-50-9 
muromonabum-CD3 muromonab-CD3	A biochemically purified IgG_{2a} immunoglobulin consisting of a heavy chain of approx. 50,000 daltons and a light chain of approx. 25,000 daltons. It is manufactured by a process involving the fusion of mouse myeloma cells to lymphocytes from immunized animals to produce a hybridoma which secretes antigen-specific antibodies to the T3 antigen of human T-lymphocytes. – – *immunomodulator*

Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
nebracetamum nebracetam	(±)-4-(aminomethyl)-1-benzyl-2-pyrrolidinone $C_{12}H_{16}N_2O$ 97205-34-0 *nootropic agent* 
nelezaprinum nelezaprine	(*E*)-9-chloro-11-[3-(dimethylamino)propylidene]-6,11-dihydro-5*H*-pyrrolo[2,1-*b*][3]benzazepine $C_{18}H_{21}ClN_2$ 69624-60-8 *centrally acting muscle relaxant* 
noberastinum noberastine	3-(5-methylfurfuryl)-2-(4-piperidylamino)-3*H*-imidazo[4,5-*b*]pyridine $C_{17}H_{21}N_5O$ 110588-56-2 *histamine H_1-antagonist* 
nuvenzepinum nuvenzepine	6,11-dihydro-11-(1-methylisonipecotoyl)-5*H*-pyrido[2,3-*b*][1,5]benzodiazepin-5-one $C_{19}H_{20}N_4O_2$ 96487-37-5 *antiulcer, gastric antisecretory* 
ondansetronum ondansetron	(±)-2,3-dihydro-9-methyl-3-[(2-methylimidazol-1-yl)methyl]carbazol-4(1*H*)-one $C_{18}H_{19}N_3O$ 99614-02-5 *serotonin antagonist* 

Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
pentisomidum pentisomide	(±)-α-[2-(diisopropylamino)ethyl]-α-isobutyl-2-pyridineacetamide $C_{19}H_{33}N_3O$ 96513-83-6 *antidysrhythmic* 
phenylpropanolaminum phenylpropanolamine	(±)-norephedrine $C_9H_{13}NO$ 14838-15-4 *sympathomimetic* 
piroxantronum piroxantrone	5-[(3-aminopropyl)amino]-7,10-dihydroxy-2-[2-[(2-hydroxyethyl)amino]-ethyl]anthra[1,9-*cd*]pyrazol-6(2*H*)-one $C_{21}H_{25}N_5O_4$ 91441-23-5 *antineoplastic* 
prifelonum prifelone	3,5-di-*tert*-butyl-4-hydroxyphenyl 2-thienyl ketone $C_{19}H_{24}O_2S$ 69425-13-4 *nonsteroidal anti-inflammatory* 
ridogrelum ridogrel	(*E*)-5-[[[α-3-pyridyl-*m*-(trifluoromethyl)benzylidene]amino]oxy]valeric acid $C_{18}H_{17}F_3N_2O_3$ 110140-89-1 *thromboxane synthetase inhibitor* 
rosterelonum rosterelone	17β-hydroxy-1α-methyl-17-propyl-5α-androstan-3-one $C_{23}H_{38}O_2$ 79243-67-7 *antiandrogen* 

Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
roxindolum roxindole	3-[4-(3,6-dihydro-4-phenyl-1(2*H*)-pyridyl)butyl]indol-5-ol $C_{23}H_{26}N_2O$ 112192-04-8 *presynaptic dopamine agonist* 
saperconazolum saperconazole	(±)-1-*sec*-butyl-4-[*p*-[4-[*p*-[[(2R*,4S*)-2-(2,4-difluorophenyl)-2-(1*H*-1,2,4-triazol-1-ylmethyl)-1,3-dioxolan-4-yl]methoxy]phenyl]-1-piperazinyl]phenyl]-Δ^2-1,2,4-triazolin-5-one $C_{35}H_{38}F_2N_8O_4$ 110588-57-3 *antifungal* 
sarmazenilum sarmazenil	ethyl 7-chloro-5,6-dihydro-5-methyl-6-oxo-4*H*-imidazo-[1,5-*a*][1,4]benzodiazepine-3-carboxylate $C_{15}H_{14}ClN_3O_3$ 78771-13-8 *benzodiazepine antagonist* 
sitalidonum sitalidone	(±)-2-chloro-4′-hydroxy-5-(2-hydroxy-1-methyl-5-oxo-2-pyrrolidinyl)-3′,5′-diisopropylbenzenesulfonanilide $C_{23}H_{29}ClN_2O_5S$ 108894-39-9 *diuretic, hypolipidaemic* 
sumatriptanum sumatriptan	3-[2-(dimethylamino)ethyl]-*N*-methylindole-5-methanesulfonamide $C_{14}H_{21}N_3O_2S$ 103628-46-2 *serotonin agonist* 

Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
tazanolastum tazanolast	butyl 3′-(1*H*-tetrazol-5-yl)oxanilate $C_{13}H_{15}N_5O_3$ 82989-25-1 *antiallergic* 
technetium (^{99m}Tc) sestamibi technetium (^{99m}Tc) sestamibi	hexakis(2-methoxy-2-methylpropyl isocyanide)[^{99m}Tc]technetium(1+) $C_{36}H_{66}N_6O_6{}^{99m}Tc$ 109581-73-9 *radioactive diagnostic agent* 
tedisamilum tedisamil	3′,7′-bis(cyclopropylmethyl)spiro[cyclopentane-1,9′-[3,7]diazabicyclo[3.3.1]nonane] $C_{19}H_{32}N_2$ 90961-53-8 *anti-ischaemic* 
)melukastum ıomelukast	2′-hydroxy-3′-propyl-4′-[4-(1*H*-tetrazol-5-yl)butoxy]acetophenone $C_{16}H_{22}N_4O_3$ 88107-10-2 *antiasthmatic* 
troxolamidum troxolamide	3-[[2,3-dihydroxy-1-(hydroxymethyl)propyl]carbamoyl]-2,2,5,5-tetramethyl-1-pyrrolidinyloxy $C_{13}H_{25}N_2O_5$ 97546-74-2 *paramagnetic contrast medium* 

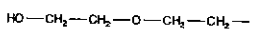
Proposed International Nonproprietary Name (Latin, English)	*Chemical Name or Description, Molecular and Graphic Formulae* *Chemical Abstracts Service (CAS) registry number* *Action and use*
vinmegallatum vinmegallate	17,18-didehydro-3α,16α-eburnamenine-14-methanol 3,4,5-trimethoxybenzoate (ester) $C_{30}H_{32}N_2O_5$ 83482-77-3 *antipsoriatic* 
zardaverinum zardaverine	6-[4-(difluoromethoxy)-3-methoxyphenyl]-3(2*H*)-pyridazinone $C_{12}H_{10}F_2N_2O_3$ 101975-10-4 *bronchospasmolytic* 

Names for Radicals and Groups

Some substances for which a proposed international nonproprietary name has been established may be used in the form of salts or esters. The radicals or groups involved may be of complex composition and it is then inconvenient to refer to them in systematic chemical nomenclature. Consequently, shorter nonproprietary names for some radicals and groups have been devised or selected, and they are suggested for use with the proposed international nonproprietary names.

digolilum
digolil

2-(2-hydroxyethoxy)ethyl
$C_4H_9O_2$



AMENDMENTS TO PREVIOUS LISTS

Nomenclature of aminoacids:

During the Seventeenth Consultation on INNs held in Geneva from 29 April to 1 May 1987 the following was agreed:

Names for the L-form should be the names of the aminoacids without a prefix as is present practice in INNs. When there is a need to name the DL- and D-forms the INNs of the respective aminoacids should be prefixed with DL- and D- respectively. This approach is in agreement with established IUPAC practices in structural formulae for aminoacids where in the abbreviations Arg, Lys etc. the configuration is not indicated for the usual L-form but only when the aminoacid is in the D-form and then it is indicated as D-.

Chronicle of the World Health Organization, Vol. 7, No. 10, 1953

Proposed International Nonproprietary Names (Prop. INN): List 1

p. 299	acidum glutamicum glutamic acid	*replace the chemical name by the following:* L-glutamic acid

Chronicle of the World Health Organization, Vol. 10, No. 1, 1956

Proposed International Nonproprietary Names (Prop. INN): List 4

p. 32	methioninum methionine	*replace the chemical name by the following:* L-methionine

In Cumulative List No 6 replace CAS registry number by: 63-68-3

WHO Chronicle, Vol. 17, No. 10, 1963

Proposed International Nonproprietary Names (Prop. INN): List 13

p. 394 levoglutamidum
levoglutamide

replace the chemical name by the following:

L-glutamine

WHO Chronicle, Vol. 18, No. 11, 1964

Proposed International Nonproprietary Names (Prop. INN): List 14

p. 433 acidum asparticum
aspartic acid

replace the chemical name by the following:

L-aspartic acid

Cumulative List No. 3, 1971

International Nonproprietary Names (INN) for Pharmaceutical Substances

p. 17 aprotininum
aprotinin

replace the chemical name and the molecular formula by the following:

Arg-Pro-Asp-Phe-HCys-Leu-Glu-Pro-Pro-Tyr-Thr-Gly-Pro-HCys-Lys-Ala-Arg-Ile-Ile-Arg-Tyr-Phe-Tyr-Asn-Ala-Lys-Ala-Gly-Leu-HCys-Gln-Thr-Phe-Val-Tyr-Gly-Gly-HCys-Arg-Ala-Lys-Arg-Asn-Asn-Phe-Lys-Ser-Ala-Glu-Asn-HCys-Met-Arg-Thr-HCys-Gly-Gly-Ala cyclic (5→55), (14→38), (30→51)-tris(disulfide)

$C_{284}H_{432}N_{84}O_{79}S_7$

p. 117 quinbolonum
quinbolone

replace the chemical name by the following:

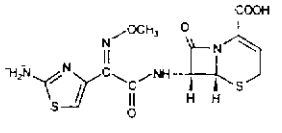
17β-(1-cyclopenten-1-yloxy)androsta-1,4-dien-3-one

WHO Chronicle, Supplement to Vol. 33, No. 9, 1979

Proposed International Nonproprietary Names (Prop. INN): List 42

p. 6 ceftizoximum
ceftizoxime

replace the graphic formula by the following:

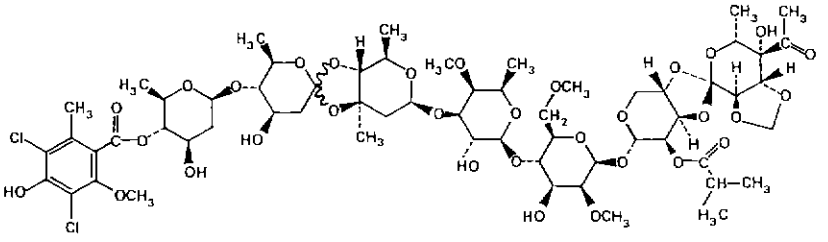


Proposed International Nonproprietary Names (Prop. INN): List 46

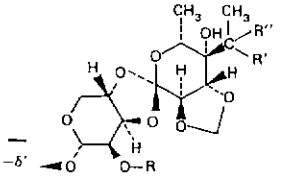
p. 3 avilamycinum
avilamycin

replace the chemical name and the graphic formula by the following:

Consists mainly of avilamycin A *or* *O*-(1*R*)-4-*C*-acetyl-6-deoxy-2,3-*O*-methylene-D-galactopyranosylidene-(1→3-4)-2-*O*-(2-methyl-1-oxopropyl)-α-L-lyxopyranosyl *O*-2,6-dideoxy-4-*O*-(3,5-dichloro-4-hydroxy-2-methoxy-6-methylbenzoyl)-β-D-*arabino*-hexopyranosyl-(1→4)-*O*-2,6-dideoxy-D-*arabino*-hexopyranosylidene-(1→3-4)-*O*-2,6-dideoxy-3-*C*-methyl-β-D-*arabino*-hexopyranosyl-(1→3)-*O*-6-deoxy-4-*O*-methyl-β-D-galactopyranosyl-(1→4)-2,6-di-*O*-methyl-β-D-mannopyranoside



major component A



minor components

	R	R' + R''
B	$-CO-CH_3$	=O
C	$-CO-CH(CH_3)_2$	−H + −OH
D_1	−H	=O
D_2	$-CO-CH_3$	−H + −OH
E	−H	−H + −OH

WHO Chronicle, Supplement to Vol. 39, May, 1985

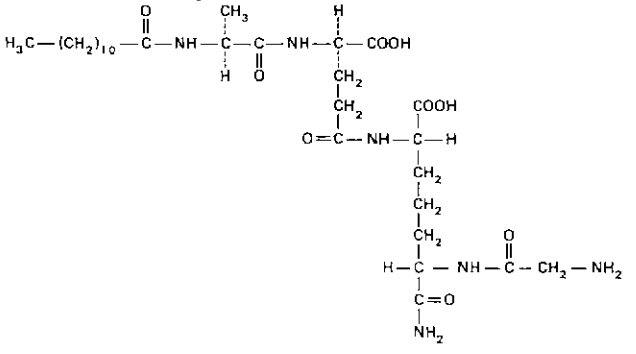
Proposed International Nonproprietary Names (Prop. INN): List 53

p. 14	*delete*	*insert*
	midalcipranum midalcipran	milnacipranum milnacipran

p. 17 pimelautidum
pimelautide

replace the chemical name and the graphic formula by the following:

threo-6-carbamoyl-N^2-[*N*-(*N*-lauroyl-L-alanyl)-D-γ-glutamyl]-N^6-glycyl-DL-lysine



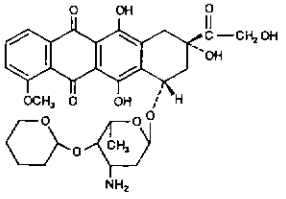
WHO Chronicle, Supplement to Vol. 40, No. 1, 1986

Proposed International Nonproprietary Names (Prop. INN): List 55

p. 11 pirarubicinum
pirarubicin

replace the chemical name and the graphic formula by the following:

(8*S*,10*S*)-10-[[3-amino-2,3,6-trideoxy-4-*O*-(2*R*-tetrahydro-2*H*-pyran-2-yl)-α-L-*lyxo*-hexopyranosyl]oxy]-8-glycoloyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-5,12-naphthacenedione



WHO Chronicle, Supplement to Vol. 40, No. 5, 1986

Proposed International Nonproprietary Names (Prop. INN): List 56

	delete	*insert*
p. 3	bermastinum bermastine	barmastinum barmastine
p. 6	ebiratidum ebiratide	*replace the chemical name by:* L-methionyl-L-glutamyl-L-histidyl-L-phenylalanyl-D-lysyl-*N*-(8-amino-octyl)-L-phenylalaninamide *S*,*S*-dioxide
p. 15	seganserinum seganserin	*replace the molecular formula by the following:* $C_{25}H_{27}F_2N_3O$
p. 16	somatropinum somatropin	*replace the molecular formula by the following:* $C_{990}H_{1528}N_{262}O_{300}S_7$

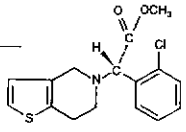
WHO Drug Information, Vol. 1, No. 2, 1987

Proposed International Nonproprietary Names (Prop. INN): List 57

p. 96 clopidogrelum
clopidogrel

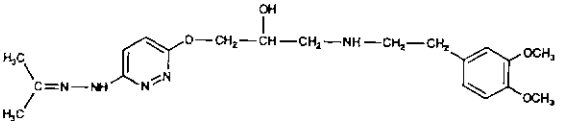
replace the chemical name, CAS registry number and graphic formula by:

methyl (+)-(*S*)-α-(*o*-chlorophenyl)-6,7-dihydrothieno[3,2-*c*]pyridine-5(4*H*)-acetate
113665-84-2



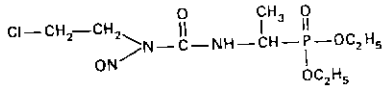
p. 97 dramedilolum
dramedilol

replace the graphical formula by the following:



p. 99 fotemustinum
fotemustine

replace the graphic formula by the following:



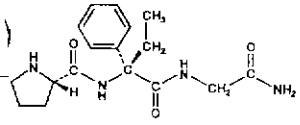
WHO Drug Information, Vol. 1, No. 3, 1987

Proposed International Nonproprietary Names (Prop. INN): List 58

	delete	*insert*
p. 177	bendacololum bendacolol	bendacalolum bendacalol
p. 178	clipoxaminum clipoxamine	cliropaminum cliropamine

p. 180 doreptidum
doreptide

replace the graphic formula by the following:



Annex 1
PROCEDURE FOR THE SELECTION OF RECOMMENDED INTERNATIONAL NONPROPRIETARY NAMES FOR PHARMACEUTICAL SUBSTANCES*

The following procedure shall be followed by the World Health Organization in the selection of recommended international nonproprietary names for pharmaceutical substances, in accordance with the World Health Assembly resolution WHA3.11:

1. Proposals for recommended international nonproprietary names shall be submitted to the World Health Organization on the form provided therefor.

2. Such proposals shall be submitted by the Director-General of the World Health Organization to the members of the Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations designated for this purpose, for consideration in accordance with the "General principles for guidance in devising International Nonproprietary Names", appended to this procedure. The name used by the person discovering or first developing and marketing a pharmaceutical substance shall be accepted, unless there are compelling reasons to the contrary.

3. Subsequent to the examination provided for in article 2, the Director-General of the World Health Organization shall give notice that a proposed international nonproprietary name is being considered.

A. Such notice shall be given by publication in the *Chronicle of the World Health Organization*[1] and by letter to Member States and to national pharmacopoeia commissions or other bodies designated by Member States.

(i) Notice may also be sent to specific persons known to be concerned with a name under consideration.

B. Such notice shall:

(i) set forth the name under consideration;

(ii) identify the person who submitted a proposal for naming the substance, if so requested by such person,

(iii) identify the substance for which a name is being considered;

(iv) set forth the time within which comments and objections will be received and the person and place to whom they should be directed;

(v) state the authority under which the World Health Organization is acting and refer to these rules of procedure.

C. In forwarding the notice, the Director-General of the World Health Organization shall request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the proposed

* Text adopted by the Executive Board of WHO in resolution EB15.R7 (*Off. Rec. Wld Hlth Org.*, 1955, **60**, 3) and amended by the Board in resolution EB43.R9 (*Off. Rec. Wld Hlth Org.*, 1969, **173**, 10).

name during the period it is under consideration by the World Health Organization.

4. Comments on the proposed name may be forwarded by any person to the World Health Organization within four months of the date of publication, under article 3, of the name in the *Chronicle of the World Health Organization* [1]

5. A formal objection to a proposed name may be filed by any interested person within four months of the date of publication, under article 3, of the name in the *Chronicle of the World Health Organization.*[1]

A. Such objection shall:

(i) identify the person objecting;
(ii) state his interest in the name;
(iii) set forth the reasons for his objection to the name proposed.

6. Where there is a formal objection under article 5, the World Health Organization may either reconsider the proposed name or use its good offices to attempt to obtain withdrawal of the objection. Without prejudice to the consideration by the World Health Organization of a substitut name or names, a name shall not be selected by the World Health Organization as a recommended international nonproprietary name while there exists a formal objection thereto filed under article 5 which has not been withdrawn.

7. Where no objection has been filed under article 5, or all objections previously filed have been withdrawn, the Director-General of the World Health Organization shall give notice in accordance with subsection A of article 3 that the name has been selected by the World Health Organization as a recommended international nonproprietary name.

8. In forwarding a recommended international nonproprietary name to Member States under article 7, the Director-General of the World Health Organization shall:

A. request that it be recognized as the nonproprietary name for the substance; and

B. request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the name, including prohibiting registration of the name as a trade-mark or trade-name.

[1] The title of this publication was changed to *WHO Chronicle* in January 1959. From 1987 onwards lists of INNs are published in *WHO Drug Information.*

GENERAL PRINCIPLES FOR GUIDANCE IN DEVISING INTERNATIONAL NONPROPRIETARY NAMES FOR PHARMACEUTICAL SUBSTANCES

1. International Nonproprietary Names (INN) should be distinctive in sound and spelling. They should not be inconveniently long and should not be liable to confusion with names in common use.

2. The INN for a substance belonging to a group of pharmacologically related substances should, where appropriate, show this relationship. Names that are likely to convey to a patient an anatomical, physiological, pathological or therapeutic suggestion should be avoided.

These primary principles are to be implemented by using the following secondary principles

3. In devising the INN of the first substance in a new pharmacological group, consideration should be given to the possibility of devising suitable INN for related substances, belonging to the new group.

4. In devising INN for acids, one-word names are preferred; their salts should be named without modifying the acid name, e.g. "oxacillin" and "oxacillin sodium", "ibufenac" and "ibufenac sodium".

5. INN for substances which are used as salts should in general apply to the active base or the active acid. Names for different salts or esters of the same active substance should differ only in respect of the name of the inactive acid or the inactive base.

For quaternary ammonium substances, the cation and anion should be named appropriately as separate components of a quaternary substance and not in the amine-salt style.

6. The use of an isolated letter or number should be avoided; hyphenated construction is also undesirable.

7. To facilitate the translation and pronunciation of INN, "f" should be used instead of "ph", "t" instead of "th", "e" instead of "ae" or "oe", and "i" instead of "y"; the use of the letters "h" and "k" should be avoided.

8. Provided that the names suggested are in accordance with these principles, names proposed by the person discovering or first developing and marketing a pharmaceutical preparation, or names already officially in use in any country, should receive preferential consideration.

9. Group relationship in INN (see Guiding Principle 2) should if possible be shown by using a common stem. The following list contains examples of stems for groups of substances, particularly for new groups. There are many other stems in active use. Where a stem is shown without any hyphens it may be used anywhere in the name.

Latin	*English*	
-acum	-ac	anti-inflammatory agents of the ibufenac group
-actidum	-actide	synthetic polypeptides with a corticotrophin-like action
-adolum	-adol	analgesics
-adol-	-adol-	
-astum	-ast	anti-asthmatic, anti-allergic substances not acting primarily as antihistaminics
-astinum	-astine	antihistaminics
-azepamum	-azepam	substances of the diazepam group
-bactamum	-bactam	β-lactamase inhibitors

bol	bol	steroids, anabolic
-buzonum	-buzone	anti-inflammatory analgesics of the phenylbutazone group
-cain-	-cain-	antifibrillant substances with local anaesthetic activity
-cainum	-caine	local anaesthetics
cef-	cef-	antibiotics, derivatives of cefalosporanic acid
-cillinum	-cillin	antibiotics, derivatives of 6-aminopenicillanic acid
-conazolum	-conazole	systematic antifungal agents of the miconazole group
cort	cort	corticosteroids, except those of the prednisolone group
-dipinum	-dipine	calcium antagonists of the nifedipine group
-fibratum	-fibrate	substances of the clofibrate group
gest	gest	steroids, progestogens
gli-	gli-	sulfonamide hypoglycemics
io-	io-	iodine-containing contrast media
-ium	-ium	quaternary ammonium compounds
-metacinum	-metacin	anti-inflammatory substances of the indometacin group
-mycinum	-mycin	antibiotics, produced by *Streptomyces* strains
-nidazolum	-nidazole	antiprotozoal substances of the metronidazole group
-ololum	-olol	β-adrenergic blocking agents
-oxacinum	-oxacin	antibacterial agents of the nalidix acid group
-pridum	-pride	sulpiride derivatives
-pril(at)um	pril(at)	angiotensin-converting enzyme inhibitors
-profenum	-profen	anti-inflammatory substances of the ibuprofen group
prost	prost	prostaglandins
-relinum	-relin	hypophyseal hormone release-stimulating peptides
-terolum	-terol	bronchodilators, phenethylamine derivates
-tidinum	-tidine	H_2-receptor antagonists
-trexatum	-trexate	folic acid antagonists
-verinum	-verine	spasmolytics with a papaverine-like action
vin-	vin-	vinca type alkaloids
-vin-	-vin-	vinca type alkaloids

[1] A more extensive listing of stems is contained in the working document Pharm S/Nom 15 which is regularly updated and can be requested from Pharmaceuticals, WHO, Geneva

Annex 2
NONPROPRIETARY NAMES FOR PHARMACEUTICAL SUBSTANCES: TWENTIETH REPORT OF THE WHO EXPERT COMMITTEE

In its twentieth report[1] the WHO Expert Committee on Nonproprietary Names for Pharmaceutical Substances reviewed the general principles for devising, and the procedures for selecting, international nonproprietary names (INN) in the light of developments in pharmaceutical compounds in recent years. The most significant recent change has been the extension to the naming of synthetic chemical substances of the practice previously used for substances originating in or derived from natural products. This practice involves employing a characteristic "stem" indicative of a common property of the members of a group. The reasons for, and the implications of, the change are fully discussed. Also reported is the intention to change the practice with regard to the nomenclature of individual members of polymeric series.

Other sections of the report concern instructions to be followed by bodies making application for international nonproprietary names, the availability of computer-printed cumulative lists of international nonproprietary names, information supplied by WHO Member States concerning their official use of national or international names for pharmaceutical products, and proposals relative to the withdrawal of international nonproprietary names allocated to substances that are no longer in use.

The official texts relating to the procedures for selecting, and general guidance for devising, international nonproprietary names are reproduced in two annexes to the report. Other annexes give examples of international nonproprietary names that incorporate selected stems, the most frequently used initial groups of letters in international nonproprietary names, a historical review of the programme of selecting international nonproprietary names, some useful literature references, and a model of the form to be used in all applications for international nonproprietary names.

[1] WHO Technical Report Series, No 581, 1975 (*Nonproprietary Names for Pharmaceutical Substances*. Twentieth Report of the WHO Expert Committee), ISBN 92 4 120581 4 Price Sw fr 6–.