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**Addendum¹ to
"The use of stems in the selection of International
Nonproprietary Names (INN) for pharmaceutical
substances" WHO/EMP/RHT/TSN/2018.1**

Programme on International Nonproprietary Names (INN)

***Health Products Policy and Standards (HPS)
Access to Medicines and Health Products (MHP)***

World Health Organization, Geneva

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Addendum* to "The use of stems in the selection of International Nonproprietary Names (INN) for pharmaceutical substances" - WHO/EMP/RHT/TSN/2018.1

* This addendum is a cumulative list of all new stems selected by the INN Expert Group since the publication of "The use of stems in the selection of International Nonproprietary Names (INN) for pharmaceutical substances" 2018.

-adenant	adenosine receptor antagonists ciforadenant (118), etrumadenant (124), inupadenant (123), muvadenant (130), preladenant (99), sipagladenant (127), taminadenant (120), tozadenant (106), vipadenant (103)
-ampator	α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor modulators farampator (92), mibampator (103), osavampator (128), pesampator (126), tulrampator (116)
-bep	engineered or synthetic scaffold proteins, non-immunoglobulin variable domain derived dazodalibep (123), elarekibep (126), ensovibep (124), izokibep (122), lerodalcibep (123), palsucibep pegol (126), taldefgrobep alfa (121), tezatabep matraxetan (122), tifalibep (122) Under (c) category: abicipar pegol (108)
-bactam	β -lactamase inhibitors
-borbactam	β-lactamase inhibitors, boronic acid derivatives ledaborbactam (125), ledaborbactam etzadroxil (125), taniborbactam (119), vaborbactam (113), xeruborbactam (125)
-bresib	inhibitors of the bromodomain and extra-terminal motif (BET) family of bromodomain (BRD) proteins, antineoplastics alobresib (117), amredobresib (126), birabresib (115), ezobresib (130), mivebresib (115), molibresib (116), pelabresib (123), sendegobresib (130), trotabresib (125)
-caftor	cystic fibrosis transmembrane regulator (CFTR) protein modulators, correctors, and amplifiers bamocaftor (121), deutivacaftor (118), dirocaftor (123), elexacaftor (121), galicaftor (119), icenticaftor (122), ivacaftor (104), lumacaftor (105), navocaftor (121), nesolicaftor (122), olacaftor (119), posenacaftor (122), riselcaftor (130), tezacaftor (114), vanzacaftor (126), zatonacaftor (128)
-calcet/-calcet-	calcium-sensing receptor (CaSR) agonists cinacalcet (88), etelcalcetide (112), evocalcet (113), tecalcet (87), upacalcet (118)
-cerfont	corticotropin-releasing factor (CRF) receptor antagonists crinecerfont (120), emicerfont (102), pexacerfont (97), tildacerfont (119), verucerfont (102)

-cianine	~~indocyanine fluorescence dye group (OLD)~~ cyanine dyes and their derivatives, diagnostic imaging agents (NEW) abenacianine (130), nerindocianine (121), nizaracianine (125), omocianine (93), pafolacianine (124), pegsitacianine (125), pegulicianine (123), zopocianine (130) under (c) category: pudexacianinium chloride (122)
-cirnon	CC chemokine receptor (CCR) antagonists ilacirnon (123), lazucirnon (123), tivumecirnon (128), vercirnon (107), zelnecirnon (130)
-(clo)sporin	ciclosporin derivatives ciclosporin (46), geclosporin (70), oxeclosporin (70), ruclosporin (114), voclosporin (97)
-copan	complement receptor antagonists/ complement inhibitors avacopan (114), danicopan (119), iptacopan (122), nomacopan (119), pelecopan (127), vemircopan (124), zoracopan (130) to be listed under (c) category: pegcetacoplan (120), zilucoplan (118)
-corat	glucocorticoid receptor agonists dagrocorat (111), fosdagrocorat (111), mapracorat (102), mizacorat (127), tomicorat (108), velsecorat (121)
-corilant	glucocorticoid receptor antagonists (non-steroidal) dazucorilant (125), exicorilant (119), miricorilant (119), nenocorilant (127), relacorilant (116), zavacorilant (125)
-delpar	PPAR delta agonists boxidelpar (126), delparantag (108), fonadelpar (114), mavodelpar (127), seladelpar (115)
-dil	<i>vasodilators</i>
-sudil	Rho protein kinase inhibitors belumosudil (123), cotosudil (123), fasudil (64), netarsudil (113), ripasudil (109), verosudil (112), zelasudil (128)
-espib	heat shock protein (HSP) 90 inhibitors (other than –mycin) cemdomespib (126), ganetespib (105), icapamespib (123), luminespib (108), onalespib (112), pimitespib (121), zelavespib (123)
-estrant	estrogen antagonists, including estrogen receptor down-regulators amcenestrant (122), bexirestrant (126), brilanestrant (115), camizestrant (125), elacestrant (115), fulvestrant (79), giredestrant (122), imlunestrant (126), palazestrant (128), rintodestrant (123), taragarestrant (127), vepdegestrant (127)

-fenicol	antibacterial antibiotics, chloramphenicol analogues azidamfenicol (14), cetofenicol (14), cloramfenicol pantotenate complex (14), florfenicol (54), racefenicol (20), sirpafenicol (126)
-fexor	farnesoid X receptor agonists cilofexor (119), nidufexor (118), omesdafexor (127), tropifexor (116), turofexorate isopropyl (103), vonafexor (122)
-fusp	fusion proteins¹ amulirafusp alfa (130), bintrafusp alfa (121), bizaxofusp (127), brenetafusp (128), cemavafusp (128), cinrebafusp alfa (121), clervonafusp alfa (120), dalutrafusp alfa (125), ebribafusp alfa (130), eciskafusp alfa (127), efdamrofusp alfa (125), ensomafusp alfa (125), etakafusp alfa (130), ficerafusp alfa (130), gulgafafusp alfa (128), invikafusp alfa (130), latikafusp (126), lepunafusp alfa (125), lorukafusp alfa (120), lunaxafusp (127), lucorafuspalfa (130), modakafusp alfa (122), nanrilkefusp alfa (126), nomlabofusp (126), onfekafusp alfa (118), oplunofusp (123), pabinafusp alfa (120), palverafusp alfa (130), rozibafusp alfa (120), simlukafusp alfa (121), sotiburafusp alfa (128), tagraxofusp (118), tebentafusp (118), tividenofusp alfa (128), valanafusp alfa (118), vensobafusp alfa (128), vimekofusp (129), vislarafusp alfa (130)
-ganan	antimicrobials, permeability increasing peptides iseganan (85), lefleuganan (127), omiganan (89), peceleganan (126), pexiganan (78), upleganan (128), voxvoganan (126), zaloganan (129)
-golix	gonadotropin releasing hormone (GnRH) antagonists elagolix (99), linzagolix (118), merigolix (128), opigolix (118), relugolix (107), sufugolix (89)
-inurad	urate transporter inhibitors dotinurad (116), darbinurad (130), epaminurad (118), lesinurad (105), lingdolinurad (129), pozdeutinurad (129), puliginurad (127), ruzinurad (125), verinurad (111), xininurad (127)
-irine	cytotoxic pyrrolobenzodiazepine dimers and analogues camidanlumab tesirine (117), loncastuximab tesirine (117), mipasetamab uzoptirine (123), olintatug tesirine (130), pivekimab sunirine (125), rolinsatamab talirine (119), rovalpituzumab tesirine (114), serclutamab talirine (120), tamrintamab pamozirine (120), vadastuximab talirine (113)

¹ A fusion protein is defined as a multifunctional protein derived from a single nucleotide sequence which may contain two or more genes or portions of genes with or without amino acid linker sequences. The genes should originally code for separate proteins, with at least two of them endowed with pharmacological action (e.g. action and targeting). “Notes from the fusion protein Working Group”, INN Working Document number 17.414 rev.

-ixafor-	chemokine CXCR4 antagonists balixafortide (112), burixafor (104), gallium (⁶⁸ Ga) boclatixaforide (126), mavorixafor (118), motixaforide (120), plerixafor (93), yttrium (⁹⁰ Y) anditixaforide (126)
-ixibat	ileal bile acid transporter (IBAT) inhibitors, bile acid reabsorption inhibitors barixibat (88), elobixibat (104), linerixibat (118), maralixibat chloride (113), odevixibat (119), ritivixibat (128), volixibat (113)
-leuton	5-lipo-oxygenase inhibitors, anti-inflammatory atreleuton (78), diroleuton (118), epeleuton (118), fenleuton (72), setileuton (101), zileuton (63)
-madlin	E3 ubiquitin-protein ligase Mdm2 (Hdm2) inhibitors alrizomadlin (125), brigimadlin (128), navtemadlin (124), rebemadlin (125), siremadlin (119), sulanemadlin (123) to be listed under category (c): idasanutlin (111), milademetan (117), serdemetan (101)
-meran	messenger RNA (mRNA) abdavomeran (124), acavameran (124), autogene cevumeran (122), bemremeran (130), enomimeran (123), fazulemeran (125), ganulameran (124), gindameran (123), luvomeran (130), nadorameran (113), ontasameran (123), pidacmeran (124), pomulmeran (123), vecilmeran (129), vibosameran (123), zapomeran (130), zeldesmeran (127), ziclumeran (127), zorecimeran (124) -tozinameran (124): riltozinameran (126), famtozinameran (128), raxtozinameran (129), pitozinameran (129) -ufrenmeran (127), tegrenmeran (130) -elasomeran (125): imelasomeran (127), secelasomeran (128), davesomeran (128), andusomeran (129), vintesomeran (129)
-pixant	purinoreceptor (P2X) antagonists camlipixant (127), eliapiixant (122), filapixant (122), gefapixant (118), sivopixant (123)
-prodil	N-methyl-D-aspartate (NMDA) receptor antagonists eliprodil (66), ifenprodil (27), onfasprodil (126), radiprodil (98), traxoprodil (86) under (c) category: -nemdaz nelonemdaz (121), rislenemdaz (116)
-protafib	protein tyrosine phosphatase (HPTP) inhibitors batoprotafib (127), ertiprotafib (87), migoprotafib (128), osunprotafib (129), razuprotafib (116), tegeprotafib (129), vociprotafib (127)
-(o)pterin	pteridine derivatives aminopterin sodium (04), fosdenopterin (121), ronopterin (113), sapropterin (63), sepiapterin (126)

-rasib	Ras protein inhibitors adagrasib (124), divarasib (127), fulzerasib (128), garsorasib (126), opnurasib (128), salirasib (97), setidegrasib (130), sotorasib (123), talorasib (130)
-rogant	retinoic acid receptor-related orphan receptor gamma (RORγ) antagonists and inverse agonists bevurogant (125), cedirogant (123), izumerogant (128), retezorogant (126), vimirogant (120)
-rsen	antisense oligonucleotides
-nersen	targeting neurological functions elsunersen (130), lexanersen (125), movronersen (125), nusinersen (112), rovanersen (125), rugonersen (125), tominersen (121), tadnersen (124), ulefnersen (127), zilganersen (126), zorevunersen (125) under (b) category: cenersen (97) under (c) category: baliforsen (116), casimersen (115), dematirsen (116), drisapersen (106), eteplirsen (103), golodirsen (115), inotersen (115), plenotersen (123), renadirsen (120), rimigorsen (116), sepfarsen (121), suvodirsen (121), varodarsen (116)
-sidenib	isocitrate dehydrogenase inhibitors crelosidenib (130), enasidenib (113), ivosidenib (114), olutasidenib (120), safusidenib (126), vorasidenib (117)
stat	enzyme inhibitors
-demstat	lysine-specific histone demethylase inhibitors bomedemstat (122), iadademstat (119), pulrodemstat (124), seclidemstat (118), vafidemstat (119), zavondemstat (128)
-becestat	beta secretase inhibitors atabecestat (117), elenbecestat (117), umibecestat (119), lanabecestat (116), verubecestat (112)
-folastat	inhibitors of folate hydrolase 1 (prostate-specific membrane antigen, PSMA) abefolastat tesaroxetan (129), flotufolastat (^{18}F) (123), iofolastat (^{123}I) (105), piflufolastat (^{18}F) (126), technetium ($^{99\text{m}}\text{Tc}$) trofolastat chloride (109), vidoflufolastat (^{18}F) (127)
-glustat	ceramide glucosyltransferase inhibitors duvoglustat (102), eliglustat (103), miglustat (85), nizubaglustat (128), sinbaglustat (121), venglustat (114)
-metostat	histone N-methyltransferase inhibitors epsametostat (130), igermetostat (129), lirametostat (123), onametostat (123), pemrametostat (123), pinometostat (112), tazemetostat (112), tulmimetostat (126), valemestostat (118)

-stinel	N-methyl-D-aspartate (NMDA) receptor co-agonists apimostinel (115), gavestinel (77), licostinel (77), nevadistinel (129), rapastinel (111), risevistinel (129), zelquistinel (121)
-tide	<i>peptides</i>
-dutide	oxyntomodulin analogues and other dual agonists at glucagon-like peptide receptor 1 (GLP-1R) and glucagon receptors (GCGR) bamadutide (119), cotadutide (119), efinopegdutide (119), mazdutide (126), pegapamodutide (116), pemvidutide (126)
-enatide	glucagon-like peptide-1 receptor (GLP1R) agonists, exenatide (exendin-4) and analogues albenatide (114), efpeglenatide (111), exenatide (89), langlenatide (111), lixisenatide (99), pegsebrenatide (127), pegloxenatide (125), visepegenatide (129), vurolenatide (126)
-netide	neurological alirinetide (117), cibinetide (114), davunetide (100), nerinetide (119), obinepitide (96), orenetide (125), trofinetide (112) under (b) category: diamfenetide (28) under (c) category: doreptide (59), nemifitide (87), pareptide (38), vanutide cridificar (100)
-paratide	parathyroid hormone analogues abaloparatide (109), eneboparatide (127), palopegteriparatide (126), semparatide (80), teriparatide (50)
-pultide	peptides and proteins, used in pulmonary surfactants elopultide (121), lusupultide (80), redipultide (119), sinapultide (78), zelpultide alfa (126)
-tinib	tyrosine kinase inhibitors
-ertinib	epidermal growth factor receptor (EGFR) inhibitors abivertinib (119), asandeutertinib (130), befotertinib (123), canertinib (87), epertinib (115), firmonertinib (129), lazertinib (117), mavelertinib (118), mifanertinib (128), mobocertinib (121), olafertinib (121), osimertinib (113), rezivertinib (122), sacibertinib (127), sunvozertinib (125), tigozertinib (130), tuxobertinib (125), xiliertinib (121), zipalertinib (126), zongertinib (128), zorifertinib (121) Under (b) category: ulixertinib (113), ravoxertinib (115) (Erk inhibitors) Under (c) category: afatinib (104), olmutinib (114), erlotinib (85), gefitinib (85), mubritinib (90), nazartinib (114), mubritinib (90), nazartinib (114)
-trectinib	tropomyosin receptor kinase (TRK) inhibitors anizatrectinib (127), boditrectinib (128), emzeltrectinib (128), entrectinib (113), larotrectinib (115), paltimatrectinib (126), repotrectinib (120), selitrectinib (120), taletrectinib (123), utatrectinib (126)

-tirom(-)	antihyperlidaemics, thyromimetic derivatives acetiromate (30), axitirome (82), bentiromide (41), eprotirome (99), omzotirome (125), resmetirom (119), sobetirome (126)
-toclax	B-cell lymphoma 2 (Bcl-2) inhibitors foselutoclax (130), imlatoclax (115), lacutoclax (129), lisaftoclax (125), mirzotamab clezutoclax (121), murizatoclax (122), navitoclax (103), obatooclax (94), pelcitoclax (122), sonrotoclax (128), surzetoclax (130), tapotoclax (121), ulintoclax pegondrimer (130), venetoclax (111), zamzetoclax (130)
-trep	transient receptor potential antagonists asivatrep (117), elismetrep (118), evifacotrep (125), libvatrep (124), mavatrep (111), motugivatrep (126), zerencotrep (130)
-trombopag	thrombopoietin agonists avatrombopag (107), eltrombopag (94), lusutrombopag (104), rafutrombopag (127), totrombopag (97)
-turev	under the advanced therapy scheme for: oncolytic viruses canerpaturev (117), gebasaxturev (126), lerapolturev (125), suratadenoturev (123), tasadenoturev (117), teserpaturev (119) under (c) category: enadenotucirev (111)
-vatein -covatein	protein vaccine substances coronavirus alsecovatein (128), upsalcovatein (129), carocovatein (128), enlicovatein (128), laricovatein (128), riticovatein (128), selvacovatein (128), tibrecovatein (128) -sorimcovatein (128), pesorimcovatein (130), tisorimcovatein (130)
-vir -capavir	antivirals viral capsid and nucleocapsid inhibitors bersacapavir (122), canocapavir (127), claficapavir (126), pocapavir (107), lenacapavir (121) under (c) category: pirodavir (63), vapendavir (106)
-trelvir	antiviral 3CL protease inhibitors abimtrelovir (126), atilotrelovir (129), bofutrelovir (127), deunirmatrelovir (129), ensitrelovir (126), ibuzatrelovir (129), imocitrelovir (130), iscartrelovir (130), limnetrelovir (130), lufotrelovir (125), nirmatrelovir (126), olgotrelovir (129), pomotrelovir (127), zevotrelovir (129)
-vivint	Wnt signalling inhibitors cirtuvivint (123), foscenvivint (124), ipivivint (123), lorecivivint (119), tegavivint (118), teplinovivint (123)

Amendments were also made in the following stems' definitions:

-eridine

from *analgesics, pethidine derivatives*

to *analgesics, pethidine derivatives and other synthetic small molecule μ -opioid receptor agonists*

kef

from *enkephalin agonists*

to *enkephalin, endorphin and dynorphin opioid δ , μ and κ receptor agonists*

-ilide

from *class III antiarrhythmics, sematilide derivatives*

to *class III antiarrhythmics, ~~sematilide derivatives~~*

-imus

from *immunosuppressants, other than antineoplastics*

to *immunosuppressants, ~~other than antineoplastics~~*

-isant

from *histamine H_3 receptor antagonists*

to *histamine H_3 receptor antagonists, inverse agonists*

-kinra

from *interleukin receptor antagonists*

to *interleukin receptor antagonists and interleukin antagonists*

-(o)nidine

from *antihypertensives, clonidine derivatives*

to *α_2 adrenoreceptor agonists*

-pressin

from *vasoconstrictors, vasopressin derivatives*

to ~~*vasoconstrictors*~~, *vasopressin analogues*

-pride

from *sulpiride derivatives*

to *sulpiride derivatives and analogues*

-prim

from *antimicrobials, dihydrofolate reductase (DHFR) inhibitors, trimethoprim derivatives*

to *antimicrobials, dihydrofolate reductase (DHFR) inhibitors, trimethoprim analogues*

-racetam

from *amide ~~type~~ nootrope agents, piracetam derivatives*

to *amide ~~type~~ nootrope agents, piracetam type*

-renone

from *aldosterone receptor antagonists, spironolactone derivatives*

to *mineralocorticoid receptor (MR, MCR, aldosterone receptor) antagonists*

-siran

from *small interfering RNA*

to *small interfering RNA including siRNA, miRNA and piRNA*

under *-tant*

-netant

from *neurokinin NK3 receptor antagonists*

to *neurokinin NK3 and dual NK3-NK1 receptor antagonists*

under *-tide*

-glutide

from *glucagon-like peptide (GLP) analogues*

to *glucagon-like peptide (GLP) analogues and agonists*

-toclax see above

from *B-cell lymphoma 2 (Bcl-2) inhibitors, antineoplastics*

to *B-cell lymphoma 2 (Bcl-2) inhibitors, ~~antineoplastics~~*

Amendments were also made in the stem's infix:

-gromab (under -mab)

from *-gros*mab

for the designation of INN for monoclonal antibodies targeting skeletal muscle mass related growth factors and receptors

-ki- (under -mab)

for the designation of INN for monoclonal antibodies targeting interleukins,

to cytokine and cytokine receptors

Please note that a new naming scheme for monoclonal antibodies was adopted at the 73rd INN Consultation. The document can be retrieved here after and from our webpages at:

[https://cdn.who.int/media/docs/default-source/international-nonproprietary-names-\(inn\)/new_mab_-nomenclature-2021.pdf?sfvrsn=207e78cb_12&download=true](https://cdn.who.int/media/docs/default-source/international-nonproprietary-names-(inn)/new_mab_-nomenclature-2021.pdf?sfvrsn=207e78cb_12&download=true)