

HELP ON PARTONOMIC LISTS

This document presents a complete description of the Partonomic Lists. It explains how to access any list of this type, how to navigate between lists from a general to a specific scope and vice-versa, what is their content and how to access the related external sources of information. This help file is the chapter 4 of the general Help book of the TA website.

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4.1 Introduction

By convention, in this document and others about documentation of TNA, we distinct anatomical units from anatomical entities. A unit is made of one to five entities depending on its type. Entities may be generic or specific, but by definition only specific entities are present in a partonomy; frequently, we encounter specific pair entities, which terms are ended by "(pair)". In the Partonomic Lists, both the specific entities and the corresponding units are displayed with their hyperlinks to Entity Pages and Unit Pages.

There is a number of external references in the present document. They will be active in the presence of an active internet connection: the referred files will open in the actual default web browser. The external references are always linking to the most recent version of a file. Therefore, an external reference may be desynchronized from a particular Partonomic List, because they are prepared at different dates. The user must be aware of this circumstance.

4.2 Overview

A typical Partonomy List is presented in figure 4.1. It is made of 4 sections plus the header and the footer highlighted in blue boxes. The partonomic list itself is divided into two blocks highlighted in red boxes: external references and the list content, made of terms in Latin and in a modern language.

The global architecture of a list is rather straightforward: any Partonomic List is made of six parts:

- a header with the title of the list,
- a navigation section for interlist navigation,
- the indented partonomic list itself in two blocs, presented in two languages,
- a set of scientific notes related to specific entities in the list,
- a signature section attesting of the own personality of the list,
- a footer with the date of publication.

The list itself is made of six columns, grouped into two blocs of columns (from left to right):

- four columns of pointers to external or internal references,
- two columns of terms in Latin and in a modern vernacular.

4.3 Definition of the Partonomic Lists

Let try a global definition: *a Partonomic List is a list in the domain of anatomy, which top entities is a cardinal body part and together with other partonomic lists is making a significant total partition of the domain.* The first affirmation is that it is a list based on the partonomic hierarchy, that is the preferred hierarchy of anatomists for the representation of their domain. The *partof* relation partly reproduces the idea of the atlas of anatomy: a collection of concepts illustrated by their parts. The second affirmation is that the domain of anatomy is naturally partitioned into systems, cardinal body parts, subdivisions and the like, and that this total partition is conveniently covered by the set of all partonomic lists.

The *part_of* relation is formally defined elsewhere in the general documentation. According to this definition, all presented entities in the partonomic lists are strict *part_of* relations (if not it is an error). Any relation like *contained_in* or *isa* is not acceptable: it is an error and it has no meaning. The fact that this statement was not verified in different past terminologies must be corrected in a modern scientific terminology.

A major feature of the Partonomic List is its ability to perform navigation between lists, the most often when pursuing the goal of moving from a global list about an entire system to a detailed list representing a specific part of it. This is implemented through the definition of levels in the lists, from P1 to P4, the highest values corresponding the more global lists. A list at any level provides automatically links to all other levels when they exist.

In addition, all lists are available in different combinations of the languages of the terminology. Navigation between languages is consequently possible at

Partonomy list P2, primary language: LA, subsidiary: EN, interface: EN, work in progress

organum gustatorium [Ⓜ]

LIST NAVIGATION

Home page: [TNA partonomy](#)

Top level: [systema nervosum [Ⓜ]](#)

Current level: [organum gustatorium [Ⓜ]](#) Extended

Subsidiary language with Latin: English [French](#) [Spanish](#) [Russian](#)

Non Latin primary language: [English](#) [French](#) [Spanish](#) [Russian](#)

PARTONOMY LIST

FMA	TA	TID	UID	Short official Latin term	Short English equivalent
27853	27853	27853	27853	organum gustatorium [Ⓜ] ; organum gustus	gustatory organ [Ⓜ]
54825	20140	2380	2380	canaliculi gustatorii [Ⓜ] ; gemmae gustatoriae	taste buds
63589	30257	7381	7381	pori gustatorii [Ⓜ]	taste pores
	29966	9327		epithelocytī gustatorij [Ⓜ]	gustatory epithelial cells; gustatory epitheliocytes [Ⓜ]
	29967	9329		epithelocytī gustatorij sensorij typi I	type 1 gustatory sensory epithelial cells
	29968	9330		epithelocytī gustatorij sensorij typi II	type 2 gustatory sensory epithelial cells
	30258	9336		epithelocytī gustatorij sensorij typi III	type 3 gustatory sensory epithelial cells
	30259	9337		epithelocytī gustatorij typi IV; epithelocytī basales [Ⓜ]	type 4 gustatory epithelial cells; basal epithelial cells; basal epitheliocytes
	30260	9342		epithelocytī gustatorij typi V; epithelocytī sustentantes [Ⓜ]	type 5 gustatory epithelial cells; supporting epithelial cells; supporting epitheliocytes
	9344	9344		plexus subcalcularis neurofibrarum	subcalcular neurofibrillar plexus
	30261	9345		fibrae gustatoriae [Ⓜ]	gustatory neurofibres [Ⓜ] ▲
	30262	9346		fibrae perigeminales [Ⓜ]	perigemmal neurofibres [Ⓜ] ▲
	30263	9347		fibrae intragemmales [Ⓜ]	intragemmal neurofibres [Ⓜ] ▲
	30277	9348		glandulae gustatoriae [Ⓜ]	gustatory glands [Ⓜ]
				14 lines	
				82.9 %	52.9 %

SCIENTIFIC NOTES

UID Libelle of note

9327 Epithelocytī gustatorij. A Taste bud contains three types of Sensory epithelial cells (Types 1 - 3), Basal cells (Type 4) and Supporting, peripheral (Perigemmal) cells (Type 5); see Benninghoff/Drenckhahn Anatomie 2004 16th ed, Band 2, pages 757/758. The type 1 cell is also known as Cellula obscura (dark cell), the type 2 and 3 cells as Cellulae clarae (clear cells).

SIGNATURE

Type of list: P2

List Unit Identifier: 7379

Subtotals: subchildren 0 subunits 0

Proper children: 13

Number of children: 13 (validated)

Proper units: 14

Number of units: 14 (validated)

Signature: 399 (validated since 13.5.2018)

Date: 09.09.2021

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External references

Anatomical terms in Latin and a modern language

Figure 4.1: Structure of an Partonomic List into five sections, on ^{LA:} *organum gustatorium*

any moment. The translation between languages being automatized, the users are sure about the unique meaning of the corresponding terms in different vernaculars.

4.4 Presentation

The Partonomic Lists concern the domain of anatomy at large, but the initial release exclusively concerns the neuroanatomy.

The neuroanatomy is presented in 3 chapters and a complement. They are:

- Chapter 1: the ent: *Central Nervous System* (CNS),
- Chapter 2: the ent: *Peripheral Nervous System* (PNS),
- Chapter 3: the ent: *Sense Organs*,
- Complement: the Cerebral Vessels.

The chapters are divided into sections for a total of 23 sections, covering the domain of neuroanatomy. The order of the section is the rostrocaudal sequence when pertinent. The table 4.1 shows all the lists. The size of each entry is represented by the number of units in the rightmost column.

Each section is available in Latin plus one of the 4 modern languages. They are English, French, Spanish and Russian. Latin can be either primary or subsidiary language. When Latin is the primary language, English is the interface language. When a modern language is selected as primary language, it is also selected as interface language. The language selection is permanent as soon as it is set up, but it can be changed at any moment.

Any list has been generated at some point in time specified by the date of publication (bottom right of the footer). The list reflects the content of the database of the terminology at this moment. Consequently, updates made later than the date of publication will not be visible.

4.5 Help on content

All Partonomic Lists present the same structure: a partonomic list under the top entity given in title, extracted from the Terminologia Anatomica database. The sum of all Partonomic List covers the entire domain of the terminology. However, the initial delivery concern uniquely the Terminologia Neuroanatomica, a subset of the whole.

As documented elsewhere, a list is a granular object of the terminology, It has a number of properties like its head unit, its size, its hierarchical structure, etc. When adding a single entity to a given list, one create a new different list. In the source database, the properties of a list are controlled by the attachment of a signature of the list, that depends on these properties. The signature guaranties the integrity of the list.

The partonomic hierarchy is formally complex. The *part_of* relation is intuitively easy to understand, but in reality it is subject to several interpretations in different context. When we restrict ourselves to the domain of anatomy, we define the *part_of* relation as a true *matter_of* relation, meaning that *A part_of*

UID	Description	P2	P3	P4	F	Lists	Units
5090	LA: <i>Meninges</i>	1	3	1	2	7	116
5264	LA: <i>Encephalon</i>	1	8	88	9	102	1694
5264	LA: <i>Telencephalon</i>		1	20	1	22	699
5779	LA: <i>Hypothalamus</i>		1	3	1	5	71
5263	LA: <i>Diencephalon</i>		1	9	1	11	181
5261	LA: <i>Mesencephalon</i>		1	7	1	9	161
5686	LA: <i>Cerebellum</i>		1	5	1	7	173
11865	LA: <i>Rhombencephalon rostrale</i>		1	20	1	22	161
5431	LA: <i>Pons</i>		1	2	1	4	23
11874	LA: <i>Rhombencephalon caudale</i>		1	18	1	20	225
5138	LA: <i>Medulla spinalis</i>	1	8	0	1	10	231
5078	LA: <i>Tractus</i>	1	9	35	9	54	447
8276	LA: <i>Systema ventriculare</i>	1	3	0	1	5	68
sub	LA: <i>CNS</i>	5	31	124	22	178	2556
8353	LA: <i>Divisio nervi cranialis</i>	1	9	3			190
9444	LA: <i>Divisio nervi spinalis</i>	1	4	31			420
9664	LA: <i>Plexus nervi somatici</i>	1	5	0			281
6758	LA: <i>Divisio autonómica</i>	1	5	9			190
sub	LA: <i>PNS</i>	4	23	43			1081
6877	LA: <i>Organum olfactorium</i>	1	0	0			15
6880	LA: <i>Organum visuale</i>	1	6	21			382
7101	LA: <i>Organum vestibulocochleare</i>	1	3	33			460
7379	LA: <i>Organum gustatorium</i>	1	0	0			14
sub	LA: <i>Sense organs</i>	4	9	54			885
10381	LA: <i>Syst arteriosum cerebrospinale</i>	1	7	9	3	20	313
10382	LA: <i>Syst venosum cerebrospinale</i>	1	10	3			175
sub	LA: <i>Vessels</i>	2	17	12			488
Total	LA: <i>Terminologia NeuroAnatomica</i>	15	80	234	25	198	5010

Table 4.1: The complete set of all partonomic lists covering the subdomain of neuroanatomy for a total of 328 lists made of 5010 units. Each entry is at level P2 and below. The columns P2, P3 and P4 give the number of sublists at this level, the column F is for the number of extended lists and the column Lists gives the total number of lists, the column Units gives the number of units for that entry.

B if all the matter of *A* is also matter of *B*. Then we extend this definition to immaterial entities, that are common in anatomy, like volumes, surfaces, lines and points. We also have extended the *part_of* relation to include the frequently used *branch_of* relation. In reality we have a somewhat restrictive *part_of* relation valid in anatomy. This relation applies to physical entities exclusively. The *part_of* relation is transitive. See elsewhere in the documentation of the terminology for additional information.

Previous versions of the terminology were not totally correct about the *part_of* relation. Some relations are *isa* relations in the parts named *nomina generalia*, which are indeed an expression of the taxonomy of the domain. Other are simply wrong: *LA:fissura longitudinalis cerebri* is not a *part_of* *LA:hemispherium cerebri*. Such discrepancies does not influence too much the reading of the terminology, but they are not precise and possibly ambiguous. The present version attempts to correct these weaknesses.

In the Partonomic List, the partonomic hierarchy is made visible by the indentation of the entities in the presentation. A single indentation means a *part_of* relation. When an entity in the list has 3 children, the first one appears immediately below with a single indentation, followed by all the entities of its descendant hierarchy with additional indentations. Then appears the second child with the same indentation as the first child, followed by its descendant hierarchy. Then finally the third child and its descendant hierarchy. This universal presentation is applied everywhere in the list, with 2 exceptions.

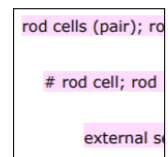
The first exception is about the references, marked by a reference icon on its right. An entity specified as a reference is not included in the partonomic list at this location. Despite it is indented relative to its above entity, it is definitely not *part_of* it. A reference entity means *see also* and nothing more. In other words it says: the here mentioned entity is of interest here by some relation or properties. The user interested by this entity should search it in the terminology. For example, the *LA:fila olfactoria* is not a part of the *LA:nervus olfactorius* and is presented in the partonomic lists under the olfactory nerve as a reference. It is neither a part of the *LA:organum olfactorium*, where it also appears as a reference. In fact, it is a part of the encephalic tracts *LA:tractus originis telencephali*.

The second exception is about the inserted partonomies, which are separate partonomies, independent, but of interest at the present position. Indeed, the domain of anatomy is made of a global partonomy under the top entity *LA:corpus humanum*, plus an indefinite number of dedicated inserted partonomies, in order to describe composite entities. A typical example is *LA:neura bacillifera* or *EN:rod cells* of the *EN:retina*. In the global partonomy, under *LA:organum visuale*, we find somewhere the composite entity rod cells, meaning the set of all rod cells of the retina. Because we want to start a description of a single rod cell, it is necessary to open a separate partonomy with rod cell as its top entity. The occurrence of such a partonomy in the partonomy is made visible by the presence on the left of the new top entity of the number sign #. Such a partonomy could be presented alone, outside of the actual context. There are several occurrences of such partonomies.

As usual, the terms in the Partonomic Lists are optionally followed by the universal icon (the circled U) when a term is computed from an universal formula. The dark icon is for pure universal term with strict correspondence between the formula and the translated term; the light icon means an inherited



Reference icon



Alternate partonomy




Universal icon

term from the formula with a minor difference. The absence of the icon means that the term is specific to a vernacular and incompatible with the universal formula. It can be either regular according to the formal grammar of terms (see documentation elsewhere), or irregular. Only the regular terms are guaranteed to be properly handled in all situations. The regularity of terms is under the responsibility of the National committees, acting for their languages.

The four left columns of the Partonomic List are hyperlinks, referencing the entity and the unit of this line in four contexts, where they are relevant. Some positions may be empty, meaning that the entity has not been found there. The four external references are:

- the Foundational Model of Anatomy (FMA), which acts as cardinal reference for human anatomical taxonomy,
- the Terminologia Anatomica, version 1998 (TA98), which is the reference terminology of human anatomy, published by IFAA,
- the specific Entity Page of the Terminologia Neuroanatomica (TNA), which is a subpart of Terminologia Anatomica, revised and accepted by IFAA General Assembly on August 2019.
- the Unit Page of the Terminologia Neuroanatomica (TNA).

The third and fourth references are to the TNA website itself (<http://ifaa.unifr.ch>), where we are now. They are consequently in relative form, on the contrary of the first two links, which are in absolute form.

FMA	TA	TID	UID
27853		7379	7372
54825		30140	7380
63589		30252	7381
		29956	9327

4 references

4.6 Item description

All items of a Partonomic list are reviewed thereafter. The order of presentation is top to bottom, left to right.

Header introduction text This text is currently invariable. It helps to distinguish this list from others.

Title of the Partonomic List This is the main Latin term of the top entity of the list. The universal sign - a circled U - may be present on the right of this term. It means that the term is directly computed from a universal formula.

Title of section Partonomy List

Legends of the columns There are 6 columns in a Partonomic List. The first 3 columns are hyperlinks to respectively the FMA, TA98 and the website of neuroanatomy. The last 2 columns are the terms denoting an entity in Latin and the selected modern language of the list.

FMA link When an entity of the list has an equivalent entity in the FMA, its FMA identifier is given, acting as an hyperlink to a representative website of the FMA (<https://bioportal.bioontology.org/ontologies/FMA/>). This website will open on the selected entity, when call from a Partonomic List. The hyperlinks remains active when the list is locally stored or exchanged between users.

The FMA link establishes a correspondence on entities of the TA and the FMA. It is not guaranteed to be exact and the authors of the TA terminology cannot exclude that divergent meanings are possibly present.

TA98 link When an entity of the list is equal to an existing TA98 entity, the TA98 icon (the Da Vinci homonculus) is displayed, acting as an hyperlink to a representative website of TA98 (<https://ifaa.unifr.ch/Public/EntryPage/HomePublicNew.html>). This website will open on the selected entity. The hyperlinks remains active when the list is locally stored or exchanged between users.

The correspondence between TNA and TA98 is guaranteed to be exact, because both terminologies use common identifiers, as first published on the TA98 website since 2013.

Entity Page link The specific entity present in the partonomic list can be reached by this link, displaying its Entity Page.

Temporary: the availability of the Entity Pages may be restricted until a complete validation is performed.

Unit Page link Each entity in the list is a constitutive part of a unit, which identifier is displayed, acting as link to its Unit Page.

Temporary: the availability of the Unit Pages may be restricted until a complete validation is performed. The same is true of the hyperlinks on the Unit Page itself.

Reference to a scientific note A down arrow just on the right of the Unit Page link calls for a scientific note related to this unit, presented in the section below the list itself.

Latin terms The Latin terms is the collection, semi-column separated, of the main term and up to 3 synonyms of the Latin versions of the terms of this entity. Each term may be followed on its right by the universal icon when the term is computed from a universal formula.




Modern language terms The modern language terms are similar to Latin for the selected modern language. In English, the terms are in UK English. When the US English is different, a black triangle is displayed.

Number of lines As the last line of the Partonomic list (partonomy list section) is given the total number of lines in the list (not including the line of titles of columns, and not included the present line). This is possibly not the number of entities in the list, because of the two exceptions: references and inserted partonomies (see above).




Title of section Scientific notes

Legends of the columns This section is made of two columns. The first column gives the Unit Identifier (UID) to which the note is attached. The second column is the note itself in English free text.

Unit identifier A scientific note is attached to a units, which identifier is displayed there.

FMA	TA	UID
77853		7379
54825		7380
63589		7381
		93271
		9329

A scientific note for 9327

rofibrillar plexus
ibres 
eurofibres 
neurofibres 

The UK/US flag

Scientific note A scientific note is an English free text, giving a scientific comment and making references to the scientific literature. The note corresponds to the unit mentioned in the first column.

Date of publication Each Partonomic List is built at a specific point in time. The date figures this moment.

IFAA reference The IFAA signature acts as an hyperlink to the official IFAA website (<http://ifaa.net>).

Copyright information The two links on this last line of the page are pointing to copyright information available on the Creative Common website (<https://creativecommons.org>).

4.7 Navigation

The figure 4.2 presents a complete example of navigation at 4 levels. This example is using the P4 list of LA: *sclera*. In the navigation section, one can see the references to the top level, the levels 2 and 3, and the current P4 level.

The organization in levels is as natural as possible, but the goal is to split the whole TNA at the top level into more than 200 detailed lists at the P4 level, ideally of a similar size. This constraint may make the splitting somewhat arbitrary. Here is a presentation of the four levels:

Top level P1: The top level is the TNA itself, with more than 5000 units in the list. Of course, such a large list cannot be easily displayed, therefore it is replaced by a short version, where the development of the partonomy is stopped each time a term at the level P2 is encountered. Consequently, the list is reduced to 21 lines.

Level 2: This level corresponds to the subchapters at level P2 of each chapter of the TNA, in particular to all the segments of the neuraxis. There are only 15 lists at this level. They are presented in two forms: a short list limited to the terms up to the next level P3 and a extended list with all the terms.

Level 3: This level corresponds to subdivisions at level P3 of a list at level P2. There are some 80 lists at this level for the TNA. They are presented in two forms: a short list limited to the terms up to the next level P3 and a extended list with all the terms.

Current level: This level is a fake proposal, because no navigation is available on it. This level is necessarily one less than its above level: it may be P3 or P4. At this level, we find only the extended form of the lists.

Navigation from the actual list is always bidirectional: to an upper level or to a lower level. The navigation towards an upper level is performed in the navigation section. The user simply selects either a short list or an extended list between the proposals, or the top level.

The navigation towards a lower level is performed inside the list itself, in the left column, on an entity marked at some level P2, P3 or P4, if any is present.

LIST NAVIGATION			
Home page	TNA partonomy		
Top level	systema nervosum ⓘ		
Level 2	organum visuale (par) ⓘ Short Extended		
Level 3	tunica fibrosa bulbi oculi (par) ⓘ Short Extended		
Current level	sclera (par) ⓘ		
Subsidiary language with Latin	English French Spanish Russian		
Non Latin primary language	English French Spanish Russian		

PARTONOMY LIST					
FMA	TA	TID	UID	Short official Latin term	Short English equivalent
58269		34775	6892	sclera (par) ⓘ	sclera (pair) ⓘ
58411		34778	6893	sulcus sclerae (par) ⓘ	scleral sulcus (pair)
58373		26312	7531	laminae sclerae (par) ⓘ	scleral layers (pair) ⓘ
58362		34781	6898	lamina episcleralis sclerae (par) ⓘ	episcleral layer of sclera (pair) ⓘ
58365		34784	6899	substantia propria sclerae (par) ⓘ; stroma sclerae (par)	substantia propria of sclera (pair); stroma of sclera (pair)
58368		34787	6900	lamina fusca sclerae (par) ⓘ	suprachoroid layer of sclera (pair)
58371		34790	6901	lamina cribrosa sclerae (par) ⓘ	cribrosal layer of sclera (pair) ⓘ
		26295	7532	cellulae sclerae (par) ⓘ	cells of sclera (pair) ⓘ
		26299	7535	melanocyti sclerae (par) ⓘ	scleral melanocytes (pair)
9 lines					
100.0 %					75.6 %

Figure 4.2: Structure of an Partonomic List into four sections, on *LA: sclera*

The selection TNA partonomy means to leave the navigation in the lists and to return to the starting page.

The move from one language selection to another is also proposed in the navigation section. Such a move becomes permanent until a next move is performed.

4.8 Log of updates

25 Dec 2021 Creation of the file.

4.9 Credentials

This document is part of the help system accompanying the website on Terminologia Anatomica. It expresses the vision of the authors of the terminology about its content and its form of presentation. Despite it is as exact as possible, close to the reality of the database of the terminology and the surrounding software, approximations, errors and ambiguities are possible and should be considered as independent of their willingness and intents.

Identified comments about the content of the website and its presentation are welcome. An appropriate answer will be given when pertinent.

Authentic URL of this file: <https://ifaa.unifr.ch/Public/TNAEntryPage/help/HelpPartList.pdf>