

HELP ON UNIT PAGE

This document presents a complete description of the Unit Page. It explains the content of the Unit Page and how to access the related external sources of information.

This help file is the chapter two of the general Help book of the TA website.

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2.1 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)".

An example is necessary in order to clearly establish the basic difference between a unit and an entity. Let consider the *humerus*, a typical object in the domain of anatomy. Nobody has ever seen an humerus! Of course what exists in reality are the *left humerus* and the *right humerus*; together they form the *humerus (pair)*. Because they exists in reality, they are specific entities and can be found in a partonomy. The pair is the partonomic father of the two lateral members. In addition there is a taxonomic father to the two lateral entities named the *generic humerus*. It is a sort of left humerus without its left shape and simultaneously a right humerus without its right shape. Such an entity does not exist in reality: it is a mental artifact. The entire taxonomy, except its leaves, is made of such artifacts, the generic entities. The four above defined entities represent the object *humerus* as a pair unit LA:*humerus*. All pair units

are made of four entities. More on the unit/entity difference can be found in the general documentation.

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 Unit Page, because they are prepared at different dates. The user must be aware of this circumstance.

2.2 Overview

The Unit Page is the presentation of information directly linked to a specific anatomical unit, as defined in the TAH (Terminologia Anatomiae Humanae) and identified by its official unique identifier UID. Links to the corresponding Entity Pages for the same unit are available for an easy navigation in the TAH. Links to all hierarchical lists containing the corresponding unit are present. Other entity based pages can also be reached.

The presentation of an anatomical terminology has to be founded on the most natural unit of knowledge, corresponding to the feeling of casual users and giving rise to the most immediate understanding of the content in this domain. However, this statement should not hide the in-depth knowledge, which necessarily is present in the background and available on request of the users on need of precise and detailed information. The natural units of knowledge are the anatomical Units, to be differentiated from the anatomical Entities. These two aspects have to be resolved in parallel, and the art of excellent presentation has to be deployed.

An anatomical Entity is defined as any body part which can be isolated, dissected and represented as distinct of other entities. But, there is no doubt that some entities are closely linked together, like the left and the right humerus; the pair of humerus is a third entity and the generic humerus is a fourth one. More than 60% of entities of gross anatomy are pairs. Other entities are grouped in sets. The consequence is that the natural unit of representation is the group of entities, to be call a Unit. It is important to make explicit this aspect of the terminology.

The Unit Page is less detailed than the Entity Page and should be the first page to consult, using the navigational links for further information when necessary. The Unit Page is shorter and simpler than the Entity Page: it does not present the detailed language information.

The information of interest on the Unit Page is of the following categories, which are presented in successive sections thereafter: the identification information, the navigation information, the definitions, the partonomic hierarchy based on the specific entities of the units and the taxonomy based on the generic entities of the units.

This page is oriented to the granularity level of a unit, which is a major natural division of an anatomical terminology. Other granularity levels - the lists, the entities and the words - are simply referenced in this page, but not developed.

In this page as in numerous other pages, the language is three-fold: the main language, the subsidiary language and the presentation language. Poten-

Unit page, primary language: LA, subsidiary: FR, interface: EN, work in progress

rami cardiaci thoracici (par)

IDENTIFICATION

Official Latin term	rami cardiaci thoracici (par)
Official subsidiary term	rameaux cardiaques thoraciques (paire)
Unit identifier	TAH:U6783
Unit type	pair set
Materiality	material

NAVIGATION

PARTONOMY

TAXONOMY

Date: 29.11.2021

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Figure 2.1: Structure of a Unit Page into four sections, on LA: *rami cardiaci thoracici*

tially, they can be freely permuted from the available languages: Latin, English, French, Spanish, Russian and more to be added. A typical selection is one modern language as main language, Latin as subsidiary language and the above selected main language as presentation language. Inversion of main and subsidiary languages is frequent. The interplay between languages is developed elsewhere in the general documentation.

The explicit rendering of a modern anatomical terminology is achieved by presentation of the Unit Page with the two basic hierarchies. On one side, the partonomic hierarchy is the preferred approach of anatomists, because it tends to reproduce the paradigm of the atlas of anatomy. On the other side, the taxonomic hierarchy brings a formal aspect to the terminology, allowing definitions of entities and units.

2.3 General layout

The Unit Page is divided at maximum into 6 types of sections, according to the kind of information which is there presented. The figure 2.1 shows an example with 4 sections, of which 3 have been closed. The sections are the following:

- Identification section
- Navigation section
- Definition section
- Documentation section
- Partonomic section
- Taxonomic section

The Unit Page, like numerous other pages, is governed by the language selection, visible on the top legend of the page and which can be changed as often

as necessary. Three languages are active: the main language, the subsidiary language and the presentation language. The first two vernaculars concern the content and the last one concerns the presentation exclusively.

Any section may be either open or closed, as indicated by the open/close icons on the left of the title. This is a dynamic feature: any click on the present icon will switch the section to the opposite status.

All sections of the Unit Page will be examined now in turn.



Open/Close
section icons

2.4 Identification section

This section is composed of 5 items or lines of information active for the identification and reference of the unit specified for this page. These items are visible on figure 2.1.

Official Latin term: each anatomical entity receives a TAH unique official term in Latin. This term is guaranteed to be unique in its extended form, as given here. On the contrary any short form cannot be guaranteed to be unique. For example *LA:tunica mucosa tracheae* is unique but *tunica mucosa* alone occurs up to twenty times in the terminology.

The terms (and all other terms on this page) are stamped with the universal icon when the term is issued from the universal formula.



Official language term: the content of the Unit Page is presented in two content languages: a main language and a subsidiary language, one of them being Latin. This item is always given in the non Latin language. Exceptions are possible with other mix of languages.

Universal
stamps

Unit identifier UID: this is the unique identifier of units in the TAH: a unique sequential number, which is blind and computer-generated. This is a positive integer to run from 1 to 24'999. Blind means that no meaning is attached to the value of this number.

The initial unique identifier in the TA98 version, which was a 11-digit code, has been abandoned and replaced by this identifier. The past 11-digit codes were excluded because of their sequential aspect, making them hard to use in the presence of multiple updates. For historical reasons, the values from 1 to 7444 have been attributed to the units issued from TA98 (despite this is in opposition to the blindness of the identifiers!). But this ensures the continuity of identifiers since the opening of the TA98 website of 2013.

When TAH is to be referenced by external sources, the recommended format is the prefix 'TAH:U' followed by the internal identifier, U is for Unit. For example: TAH:U2281 *LA:labia stomatis*. The mention of LA for Latin is optional.

In fact, TA98 represents units and not entities. In general, but not always, the TA98 entity is the generic entity in TAH. This means that the generic entities have an entity identifier between 1 and 24999. All other entities issued from TA98 got an entity identifier TID of 25'000 and above. New generic entities from the successive revisions got values from 7445 to 24'999 and higher for non generic entities. The total number of entities is expected to be above 70'000.

#	Value	Description
1	undefined	undefined type, normally absent
2	single	single unit (1 entity)
3	pair	pair unit (4 entities)
4	paired set	pset unit (5 entities)
5	set	set unit (2 entities)
6	reference	reference unit used for duplication of an existing unit
7	deleted	deleted unit, which has been a published entity
8	lexical	lexical unit used for renaming an existing unit
9	taxonomic	taxonomic unit limited to a single generic entity
10	transitory	unused unit in a temporary wait state
11	vocabulary	vocabulary unit as recipient of words of the languages
12	TA98 duplicate	reference unit for TA98
13	interface	interface unit as container of texts for the website
14	mixed set	mixed set unit (2 entities)

Table 2.1: The 14 types of units.

Unit type: each entity belongs necessarily to a defined unit type. There are 14 types documented in the figure 2.1. The entity type influences the remaining presentation in this page.

Materiality: a unit represents either a material object of the domain of anatomy or an immaterial object like a volume or space, a surface, a line or a point. This item has the value *non physical* when the unit concerns a non physical object.

2.5 Navigation section

The navigation section is illustrated in figure 2.2.

Navigation to other pages from the Unit Page is accomplished by 9 different groups of links, each one with one or more possible selections. See the table 2.2 for a short description.

The 9 groups are detailed thereafter.

Link to the unit: Each entity belongs to a unit of a specified unit type. This link reaches the corresponding Unit Page of the present entity.

Links of entity, lateral links: Some unit types are built with more than one entity, up to 5 entities. When this is the case, each link reach the designed entity. A pair unit has 4 entities; a pset unit has 5 entities; a set unit has 2 entities; all other units have 1 entity. The present entity is mentioned without an active link.

Entity-related links: Other pages are designed around an entity and are available in different circumstances. They are: the Extended Page is an extension of the Entity Page with additional information, the Universal Page about the universal term and its realization in different languages, the Definition Page. These pages can directly be reached.

NAVIGATION	
Link to the unit	nervus cardiacus cervicalis superior (par) ^U
Links of entity	generic: nervus cardiacus cervicalis superior ^U
	specific: nervus cardiacus cervicalis superior (par) ^U
Lateral links	left: nervus cardiacus cervicalis superior sinister ^U
	right: nervus cardiacus cervicalis superior dexter ^U
External links	Gray1918 TA98 FMA Wikipedia
Partonomic links	Level 2: divisio autonómica ^U Short Extended
	Level 3: pars thoracolumbalis ^U Short Extended
	Level 4: truncus sympathicus (par) ^U
Taxonomic links	Level 2: nervus ^U Short Extended
Subsidiary language with Latin	English French Spanish Russian
Non Latin primary language	English French Spanish Russian

Figure 2.2: A typical navigation section based on *LA:nervus cardiacus cervicalis superior*

External links: Different links to external websites are proposed and open directly on a page relative to the actual unit. This information is optionally present. The authors of the terminology considers these websites as relevant, but do not express any guarantee about the information to be found there.

The following websites are candidates to be proposed:

- Gray Anatomy 1918 edition: The actual unit is mentioned on the displayed page of this book (home is <https://archive.org/about/>).
- Fundational Model of Anatomy: The taxonomic FMA hierarchy is open on the actual unit (home is <https://bioportal.bioontology.org/ontologies/FMA/?p=summary>).
- Terminologia Anatomica 1998: The TA98 website (2013) is open on a page representing the actual unit (home is <https://ifaa.unifr.ch/Public/EntryPage/HomePublicNew.html>).
- Wikipedia: This website is open when an article is specifically dedicated to the actual unit (home is https://en.wikipedia.org/wiki/Main_Page).
- Radiopedia: This website is open when an article is specifically dedicated to the actual unit (home is <https://radiopaedia.org>).
- ScienceDirect: This website is open when an article is specifically dedicated to the actual unit (home is <https://www.sciencedirect.com>).

The policy of the authors of the terminology is to propose alternate websites generally offering valuable scientific information in the domain of anatomy. However, the authors of this terminology can in no way be considered as responsible for the displayed or the missing content.

#	Group	Description
1	unit	to present unit (absent on a unit page)
2	entity	to entities constituting the present unit
3	lateral entity	to left and right members of a pair unit
4	unit-related page	to any different page based on this unit
5	external website	to any relevant website based on this unit
6	partonomy	to partonomic lists of superior level containing this unit
7	taxonomy	to taxonomic lists of superior level containing this unit
8	subsidiary	to a different subsidiary language with English interface
9	presentation	to a different presentation language

Table 2.2: The types of links to other pages from the unit page.

Partonomic links: The present entity is possibly part of different partonomic lists at different levels from 0 to 4. Not all levels necessarily exist for all entities, this being dependent on the size of the anatomical system to which belongs the entity. At each level (except level 4) the partonomic list may exist in two presentations: a short list with sub levels not developed or an extended list. Corresponding selections are proposed.

Taxonomic links: The present entity is possibly part of different taxonomic lists at different levels from 0 to 4. Not all levels necessarily exist for all entities, this being dependent on the size of the section of the taxonomy to which belongs the entity. At each level (except level 4) the partonomic list may exist in two presentations: a short list with sub levels not developed or an extended list. Corresponding selections are proposed.

Subsidiary language switches: This selection defines the subsidiary language with Latin as the main language and English as the presentation language.

Presentation language switches: This selection defines simultaneously the main language and the presentation language. The subsidiary language is Latin.

All the links are set at generation of the page. This not guarantees that the links will be satisfied when the user select them. Care will be given to maintain the website with a maximum of satisfied links, but updates and maintenance tasks may result in some missing links.

2.6 Definition section

On figure 2.3, we have built an assembly of four different definition sections, in order to show the translation process when the presentation language is changed.

This section displays the taxonomic definition of a unit. The language is the main language if not Latin, subject to the condition that a translation has been validated. If the main language is Latin, English is used for the definition. In the absence of a translation in the specified language, English is selected by default. In the absence of a definition, this section is not displayed.

A taxonomic definition is based on the *genus et differentia* principle, as initially stated by Aristotle. The definition is made of a left part based on the *genus* or taxonomic father, and a right part based on the *differentia*. The genus

▼ TAXONOMIC DEFINITION	
Taxonomic definition	An ansa subclavia is a branch of middle cervical ganglion [ramus ganglii cervicalis medii] which forms a loop around the subclavian artery [arteria subclavia] which connects the middle cervical ganglion [ganglion cervicale medium] and cervicothoracic ganglion [ganglion cervicothoracicum].
▼ DÉFINITION TAXONOMIQUE	
Définition taxonomique	Une anse subclavière est un rameau du ganglion cervical moyen [ramus ganglii cervicalis medii] qui forme une boucle autour de l'artère subclavière [arteria subclavia] qui connecte le ganglion cervical moyen [ganglion cervicale medium] et le ganglion cervicothoracique [ganglion cervicothoracicum].
▼ DEFINICIÓN TAXONÓMICA	
Definición taxonómica	Una asa subclavicular es una rama del ganglio cervical medio [ramus ganglii cervicalis medii] que forma un bucle alrededor de la arteria subclavia [arteria subclavia] que conecta el ganglio cervical medio [ganglion cervicale medium] y el ganglio cervicotórácico [ganglion cervicothoracicum].
▼ ТАКСОНОМИЧЕСКОЕ ОПРЕДЕЛЕНИЕ	
таксономическое определение	субключичная петля - это ветвь среднего шейного узла [ramus ganglii cervicalis medii] который образует петлю вокруг подключичной артерии [arteria subclavia], которая соединяет средний шейный узел [ganglion cervicale medium] и шейно-грудной узел [ganglion cervicothoracicum].

Figure 2.3: An assembly of four definition sections in four modern languages for the *LA:ansa subclavia*. As it can be seen in the taxonomy, the taxonomic father *LA:ramus ganglii cervicalis medii* is used for preparing the genus of the definition.

part is auto generated from the taxonomy. The differentia part is specified in the form of a short and precise free text describing the differentia, not including properties that are not necessary.

Translation of the text of the differentia is ensured by the authors of the terminology, with the help of a translating tool (Google translate). This process is largely automated and this ensures a strict similar presentation in all vernaculars. Nevertheless, these texts are expected to be validated by a native speaker of the language. Before that, translation errors would probably be present.

The text of a definition is regularly interspersed with hyperlinks to other Unit Pages, when the definition mentions other units. The hyperlink includes also the Latin main term of this unit. The hyperlinks are visible in blue on figure 2.3.

2.7 Documentation section

The documentation, that is optional in the Unit Page, brings some documentation about the specified unit. This information is generally structured in a number of paragraphs, depending on the need. In particular, such a section is visible for the part of the taxonomy on *LA:relatio partitionis*.

2.8 Partonomy section

A light partonomy section is presented on figure 2.4. The light partonomy is the simplified partonomy presented on the Unit Page, to be contrasted with the full partonomy presented on the Entity Page.

This section presents the TAH partonomic hierarchy below the unit selected for the present page. This means that any TAH unit has a position (and only one) in the TAH tree under *LA:corpus humanum*. The detailed aspects of this

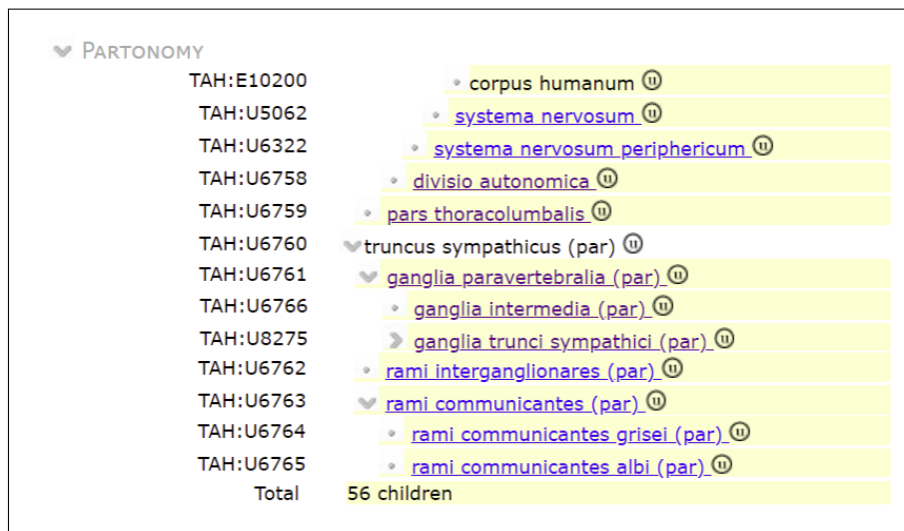


Figure 2.4: A typical light partonomy section based on *LA:truncus sympathicus* with 5 ancestors and 56 children, of which only 7 are visible, the others being visible on user action.

hierarchy are detailed in the general documentation.

The partonomy is presented with the current unit in a left most position. From there on, the upper levels - the ancestors - and lower levels - the children - of the hierarchy are presented with successive indentations. The number of ancestors is not limited (up to the top of the hierarchy) but they are not all visible, limited to 20 by an installation parameter. The number of children is not limited (up to the entire TAH) in theory, but is limited to 200 by an installation parameter in practice. In case of too many children, only the first generation of children is listed together with the number of unlisted units. The children may not be necessary visible and the user needs to open the hierarchy, using the open/close icons on the left of the terms.

This presentation of the partonomy is not complete: all left and right members of pairs are simply discarded, in order not to have too long presentations. In the example above, we could have immediately under *LA:truncus sympathicus (par)* the two entries *LA:truncus sympathicus sinister* and *LA:truncus sympathicus dexter*.

Each unit is prefixed in a left column by its UID.

The displayed unit name is a simplified form of the official term instead of its formal name: the pair units are presented by their generator term, followed by the word pair in parentheses. Example: the formal name of the pair of humeri is *par humerorum* and is replaced by *humerus (par)*. The set units are presented by their generator term at plural. This is true in all languages.

The term of the subsidiary language is visible under the form of bubbles. When moving the mouse pointer on the term, the bubble appears after a short delay.

The displayed unit names act as hyperlinks to the corresponding Unit Pages.



Open/Close

icons

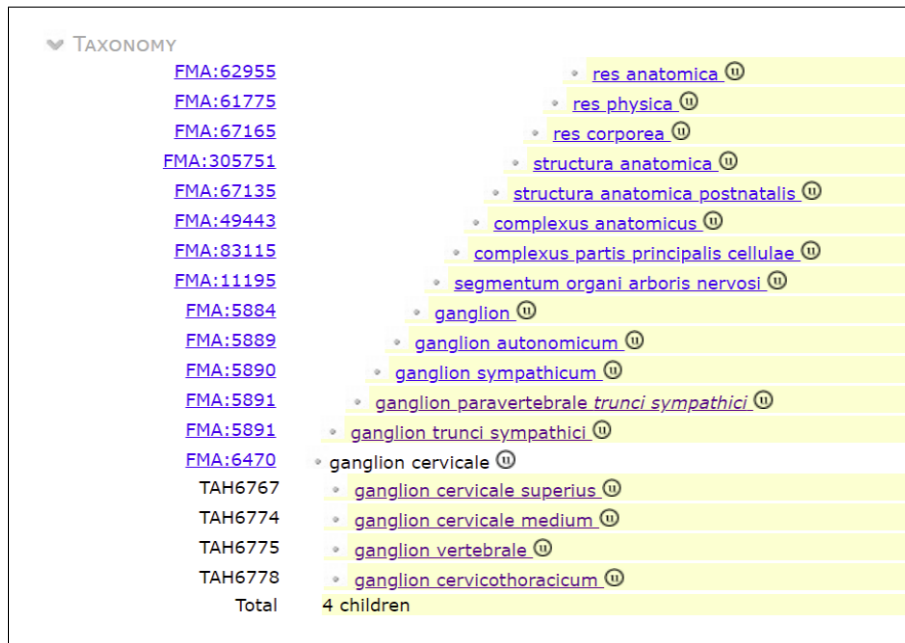


Figure 2.5: A typical taxonomy section based on LA: *ganglion cervicale*

2.9 Taxonomy section

This section presents an adapted FMA taxonomy (Foundational Model of Anatomy) as developed by the Structural Informatics Group at University of Washington, Seattle, USA.

A typical taxonomy section is shown on figure 2.5.

Temporary: When the first ancestor in the taxonomy is missing, it means that this part of the taxonomy is still under construction. Therefore, the ancestors are not visible and the taxonomic definitions are not available.

The adapted FMA taxonomy is based on the original FMA publication, but changes and updates have been necessary in the presence of recognized differences of point of view between the FMA group and the FIPAT group. Another reason for differences is the fact that the recent additions to the terminology by FIPAT have not been necessarily followed by the FMA. These differences have been limited in number as much as possible, and their number is below a few percents of the whole. The hyperlinks to the FMA allow to make its own opinion about these differences. See also the next section about the highlights on changes by background colors.

All the differences have been carefully documented, using background colors in this section. A short help on used colors is available when positioning the cursor on the corresponding text on the first line of the section. But this feature is visible only on Entity Pages.

The taxonomy is presented with the current unit in a left most position. From there on, the upper and lower levels of the hierarchy are presented with successive indentations. The number of ancestors is limited (up to 20) and they are all visible. The number of children is not limited (up to the entire TAH) in

theory, but is limited by an installation parameter in practice. In case of too much children, only the first generation of children are listed together with the number of unlisted units.

The unit displayed name is the preferred term in the main language. The subsidiary language is visible under the form of bubbles. The displayed name acts as an hyperlink to the corresponding Unit Page.

Each unit is prefixed in a left column by its identification number, either TAH or FMA. When both are present, the FMA is selected and the other is in bubble. In addition, any FMA identifier is an hyperlink to a website of FMA. This gives a direct access to a source representation of this terminology.

2.10 History of changes in taxonomy

The taxonomy, as already explained, is essentially the FMA taxonomy. However, some changes are necessary because of the two reasons: 1) new entities have been added to the terminology and the corresponding updates of the taxonomy have not (yet) been done in the FMA; 2) diverging points of view on some aspects of the FMA.

The authors of the TNA clearly want to limit the changes to a strict minimum and to maintain a large compatibility with the FMA. But some changes are necessary. In particular, the presentation of white matter is considered as not sufficient in the original FMA and a considerable evolution did occur in this subdomain since the source publication of the FMA. Another point is the taxonomy of neurons, quite larger as it was initially, on need of a refreshment.

In order to cope safely with the changes in the taxonomy, a system of background colors has been set up in the taxonomic presentation of the Unit pages. Four colors have been selected, each supporting a different message about the highlighted entity. See figure 2.6 for an example. They are presented thereafter:

Pink for modified entity: The present entity has been modified as described by the light blue and grey color paths.

Light blue for new path: The new path for the modified entity.

Grey for old path: The old path for the modified entity, ended on top by the junction entity on which to jump in the above hierarchy.

Yellow: The terms in Latin are usually highlighted with this color.

Indeed, the new taxonomy can be read when ignoring the grey colored entities. And an immediate comparison with the old path is possible. Comment: the new entities in light blue have no reference to FMA in the left column, because they do not exist in the FMA.

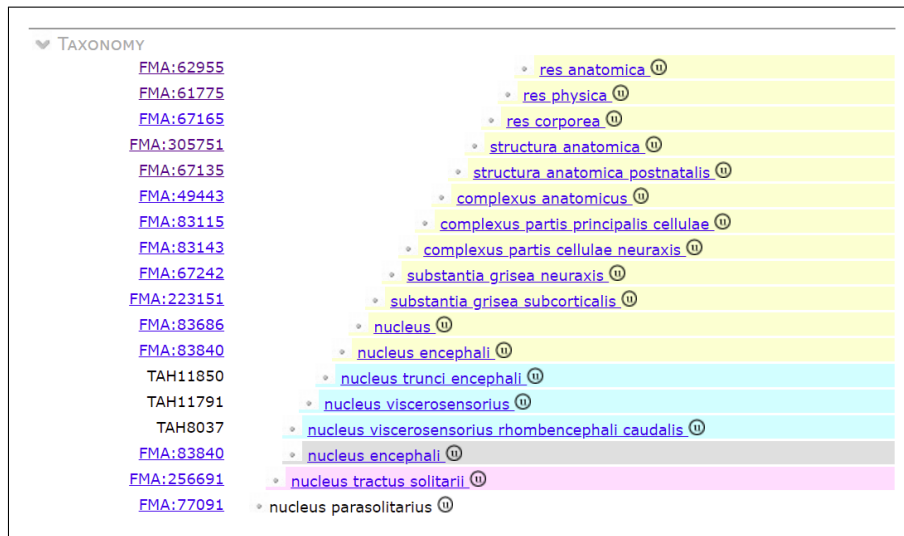


Figure 2.6: A changed taxonomy section based on *LA: nucleus parasolitarii*

2.11 Log of updates

26 Mar 2022 Update for documentation section

15 Mar 2022 Update for history of changes in taxonomy

01 Dec 2021 Creation of the file.

2.12 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/HelpUnitPage.pdf>