

## **Annotated Nomenclature Tables 4.0**

This is the fourth version of hierarchical Annotated Nomenclature Tables for *Brain maps: structure of the rat brain*. The order followed here is strictly topographic. In the first edition (Swanson, 1992) a functional scheme was used for ordering, and this was modified in the second edition (Swanson, 1998), and modified even more in the third edition (Swanson, 2004), which followed the 4 systems functional network model of nervous system organization (Swanson, 2003).

Topographic ordering was chosen here because anatomy is relatively constant whereas views on function evolve much faster. Put another way, anatomical observations have a much longer lifetime and are easier to establish, than functional interpretations. This is why, historically, structural understanding has always far outstripped functional interpretation for the nervous system. In this sense, strictly topographic ordering of nervous system parts is the least controversial, most foundational approach. But ultimately, to understand the organizing principles of nervous system circuitry, a structure-function organizational scheme based on connections between parts is required (see Bota et al., 2015). Thus, structural, functional, and connectional ordering schemes all have their use.

The hierarchical nomenclature system presented here in Tables A-J is based on the *Systematic Parts Lists for Nervous System Ontology* in the Appendices (1-10) of Swanson (2014), which in turn were based on principles established in the *Foundational Model of Connectivity* (Swanson & Bota, 2010).

### **Nomenclature Tables for Vertebrates in General**

Appendix 1 (Swanson, 2014) is a basic parts list for the adult nervous system of all animals, and it has been abstracted here for vertebrates in Table A. Appendix 2 (Swanson, 2014) is basic parts list for nervous system development in vertebrates, and it is reproduced here in Table B.

### **Nomenclature Tables for Mammals in General and Rats in Particular**

Appendices 3-10 (Swanson, 2014) were constructed mostly to describe the adult human nervous system but generally the upper levels of the hierarchy apply to mammals in general—including rat (Tables C-J); the lowest level in the hierarchy applying to mammals in general is indicated in **green**). On one hand, if a part in Appendices 3-10 is absent in a particular species, it is easily deleted in a nomenclature table for that species, along with terms below it (children in the hierarchy). On the other hand, differentiations of terms at the bottom of Appendices 3-10 hierarchies (basically, standard subdivisions of a part; see next section), for a particular species, are easily added as new children in the nomenclature tables for that species—as exemplified in the following tables for rat (Tables C-J).

### **Terms**

Conventions for naming parts have changed since the previous edition of *Brain maps* (Swanson, 2004). Now they conform to the style established in *Neuroanatomical Terminology* (Swanson, 2014). All in the annotated nomenclature tables are standard terms, with a reference given to the first publication to use the term in sense defined here. That is, the names associated with a term are not eponyms, they establish priority. In *Neuroanatomical Terminology* (Swanson, 2014) all standard terms in the 10 nomenclature tables form the main entries in the lexicon. The lexicon entry for a standard term includes a textual definition and a citation for the first use of the term in the defined sense, as well as the applicable species (and sex if relevant), age, and methodology. In addition, the lexicon entry for standard terms includes nonstandard terms: alternate spellings and translations (the default language of the lexicon is American English), early unnamed identifications, synonyms, and partial correspondences (arbitrary, unrecognized, or “unofficial” zone within a standard part; see Fig. S1w-z in Swanson & Bota, 2010). Because the nomenclature tables are arranged hierarchically, with nervous system at the top, all terms related to the structure of the nervous system can be defined in relation to the standard terms.

Within text, by convention, ***standard terms (Author, date)*** are bold italic, whereas *nonstandard terms (Author, date)* are italic. If scholarship has not established the correct precedent (Author, date) for a term, then the date (>1840), that is, after 1840, is used because in *Neuroanatomical Terminology* (Swanson, 2014), terminology to 1840 was thoroughly documented. New standard terms added here for rat are documented in the accompanying annotation.

### Ordering rules

The general plan for ordering the annotated nomenclature tables follows the topographic and topologic trends observed in vertebrate development. The first criterion is position along the longitudinal axis, from rostral to caudal, followed by position transversely, from central to peripheral. Of the two cardinal transverse planes, medial to lateral is listed before ventral to dorsal because the ***neural plate (Stricker, 1860)*** develops before the ***neural tube (Baer, 1837)***; see Swanson (2014) for further details.