

Stereotactic Atlas

A 'stereotactic atlas' (also spelled 'stereotaxic atlas') is a reference map of the brain (or other body regions) that assigns standardized coordinates to anatomical structures, allowing precise three-dimensional targeting for surgical, diagnostic, or experimental purposes.

Types

- 'Human stereotactic atlases':
 - Used in [functional neurosurgery](#), particularly for procedures like [deep brain stimulation](#).
 - Based on MRI, CT, or post-mortem brains aligned to [stereotactic](#) frames.
 - Examples include:
 - Talairach and Tournoux Atlas
 - Schaltenbrand-Wahren Atlas
- 'Animal stereotactic atlases':
 - Essential in experimental neuroscience for targeting specific brain areas in rodents or primates.
 - Common examples:
 - Paxinos and Watson Rat Brain Atlas
 - Paxinos and Franklin Mouse Brain Atlas

Coordinate System

Stereotactic atlases define coordinates along three axes based on anatomical landmarks such as the [bregma](#) or the interaural line:

- 'X-axis': medial-lateral
- 'Y-axis': anterior-posterior
- 'Z-axis': dorsal-ventral (superior-inferior)

This allows for high-precision targeting of structures during surgery or in laboratory procedures.

Comparison of Major Stereotactic Atlases

Below is a comparison of the most cited and widely used stereotactic (or stereotaxic) atlases in clinical and experimental neuroscience:

Atlas	Species	Authors	Year	Main Use	Notes
' Schaltenbrand-Wahren Atlas '	Human	Georg Schaltenbrand, Warren Wahren	1977	Deep brain stimulation , Stereotactic surgery	Based on postmortem brain. Gold standard for surgical targeting of STN , GPi , Vim .
' Talairach and Tournoux Atlas '	Human	Jean Talairach, Pierre Tournoux	1988	Neuroimaging , fMRI , PET	Provides co-planar coordinate system. Common in cognitive neuroscience.
' Paxinos and Watson Atlas '	Rat	George Paxinos, Charles Watson	1982	Rodent neurosurgery , tracing studies	Most cited atlas in experimental neuroscience.
' Paxinos and Franklin Atlas '	Mouse	George Paxinos, Keith B.J. Franklin	Various editions since 1997	Optogenetics , Genetic models	Standard in mouse-based brain research.

See also

- [Stereotactic Atlas](#)
- [Stereotactic surgery](#)
- [Deep brain stimulation](#)
- [Rodent models in neuroscience](#)

Applications

- [Deep brain stimulation](#)
- [Stereotactic biopsy](#)
- [Electrode implantation](#)
- [Neuroanatomical tracing](#)
- [Targeted drug delivery](#)

Key Reference

Schaltenbrand G, Wahren W. Atlas for Stereotaxy of the Human Brain. Thieme, 1977.
see [Morel stereotactic atlas of the human thalamus](#).

AC-PC line

see [AC-PC line](#).

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