

BRAINENGINEERING

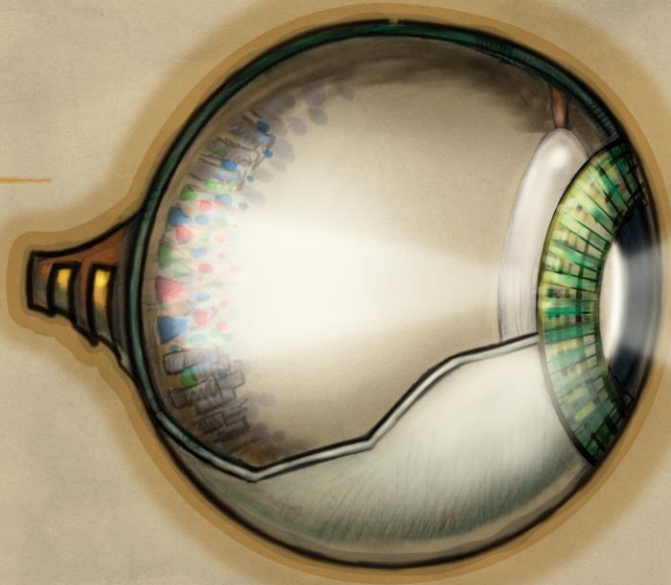
EAR



The outer ear funnels sound waves along the ear canal and into the middle ear. Here the middle ear bones amplify the sound waves and convert them into physical vibrations. These are detected by the cochlea of the inner ear which changes this mechanical input into an electrical output. The inner ear also contains the vestibular apparatus which responds to changes in body position and enables balance.



EYE



A roughly spherical ball of jelly which admits light through the pupil, an aperture whose size is regulated by the iris, a ring of muscles. The light waves are focussed by a lens onto the retina at the back of the eyeball where photoreceptor cells convert the energy of photons into electrical signals.



LARYNX & TONGUE

LARYNX

Generates sound by creating pressure differences in air expelled from the lungs. Contains the vocal cords which regulate the changes in pitch necessary for phonation.

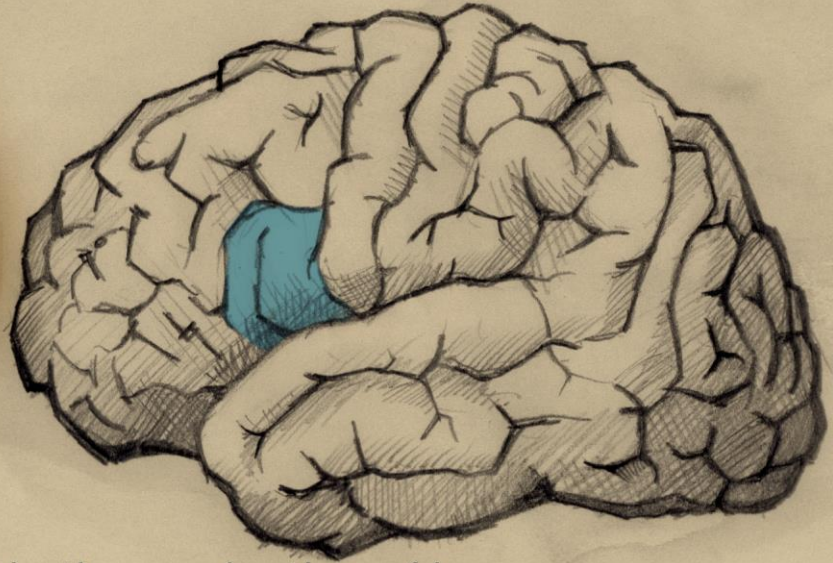
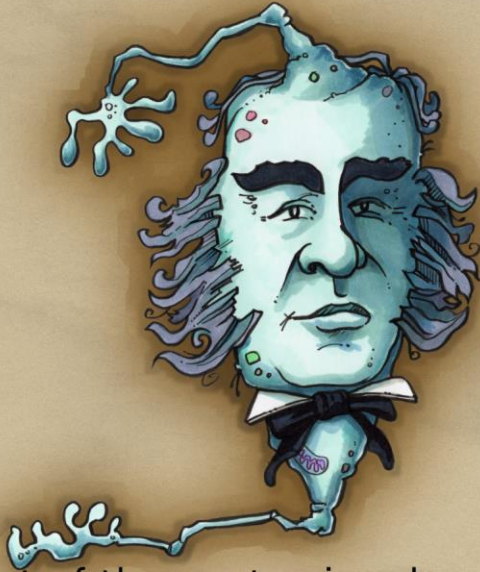


TONGUE

Changes airflow through the vocal tract to enable the production of speech sounds.



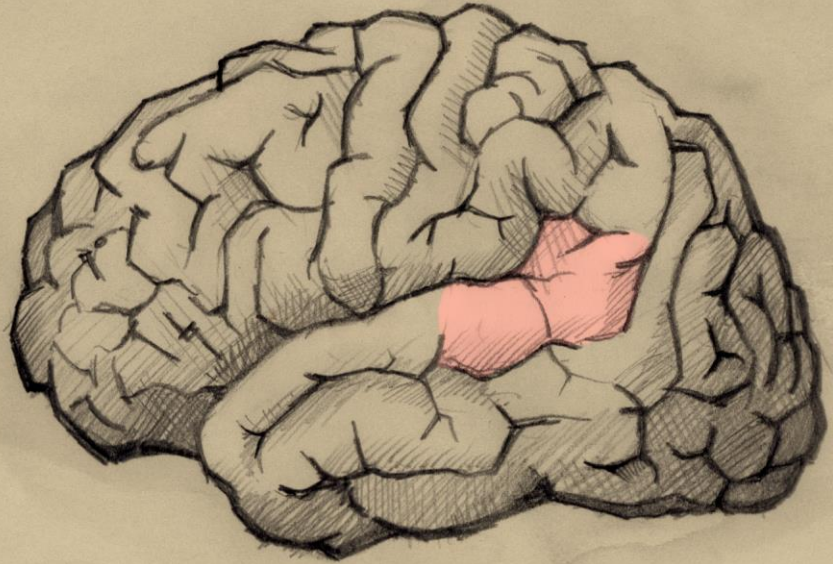
BROCA'S AREA



Part of the cortex involved in the production of language. Named after a 19th century French neurologist who shaped modern scientific understanding of how different areas of the brain work.



WERNICKE'S AREA



Part of the cortex involved in the comprehension of written or spoken language. Named after a 19th century German neurologist who shaped modern scientific understanding of how different areas of the brain work.



MOTOR CORTEX



Receives sensory input and planning signals from other brain areas. Combines these into motor commands which are sent out to motor neurons in the brainstem and spinal cord.



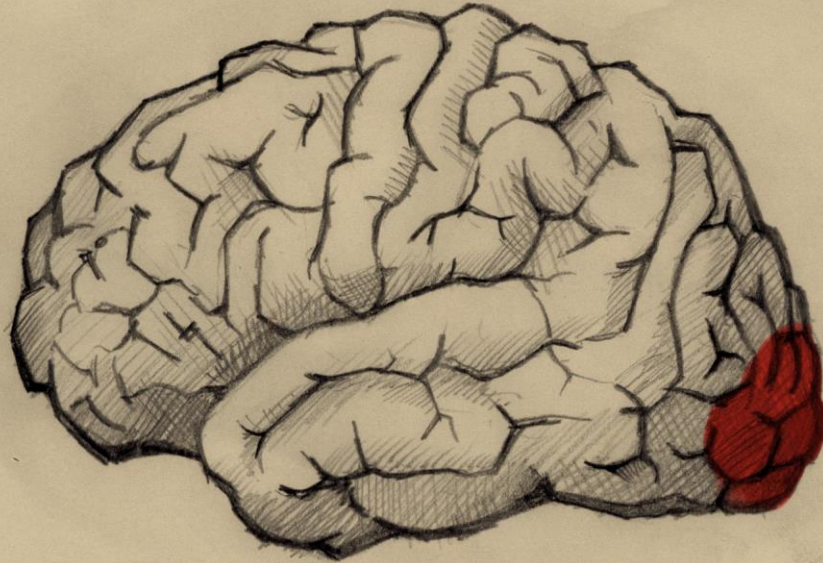
AUDITORY CORTEX



Receives auditory information from auditory nerve pathways and maps the frequency and position of sounds. Transmits the results of this processing in streams to other parts of the brain so that sounds can be perceived.



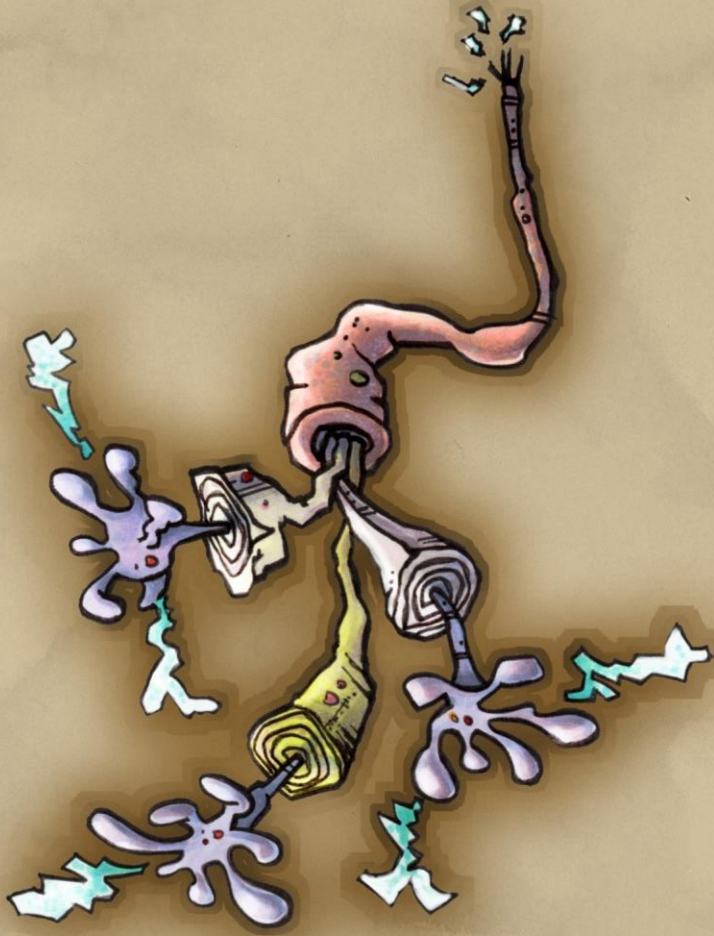
VISUAL CORTEX



Receives visual information from optic nerve pathways and responds to patterns and movement. Transmits the results of this processing in streams to other parts of the brain so that images can be perceived.



OPTIC NERVE

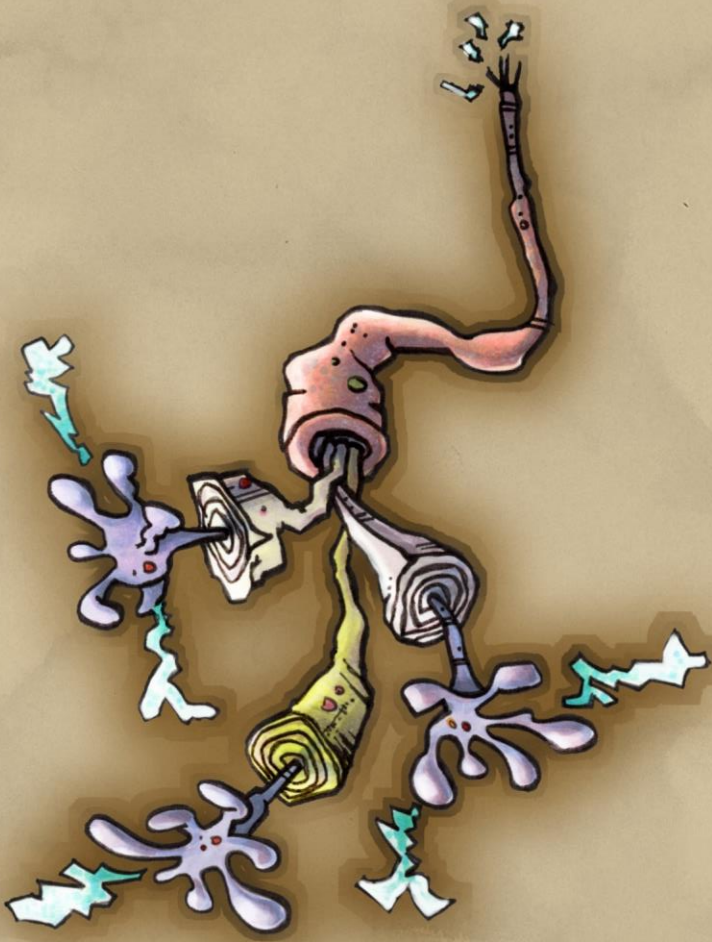


Carries electrical signals from the retina to the visual cortex.

The second cranial nerve, nII.



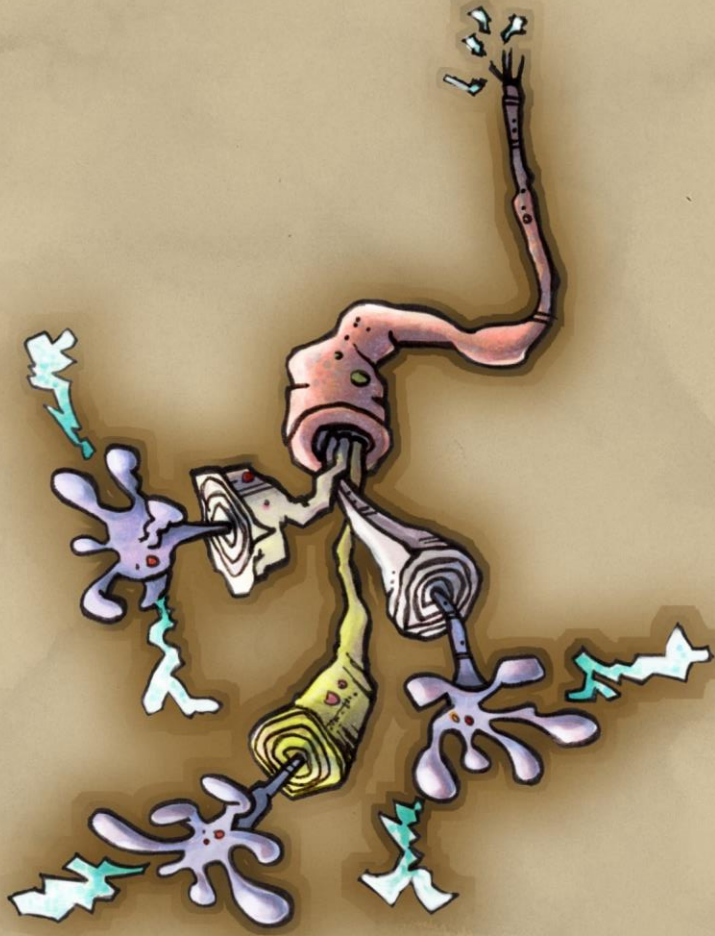
AUDITORY NERVE



Carries electrical signals from the cochlea to
the auditory cortex.
The eighth cranial nerve, **nVIII**.



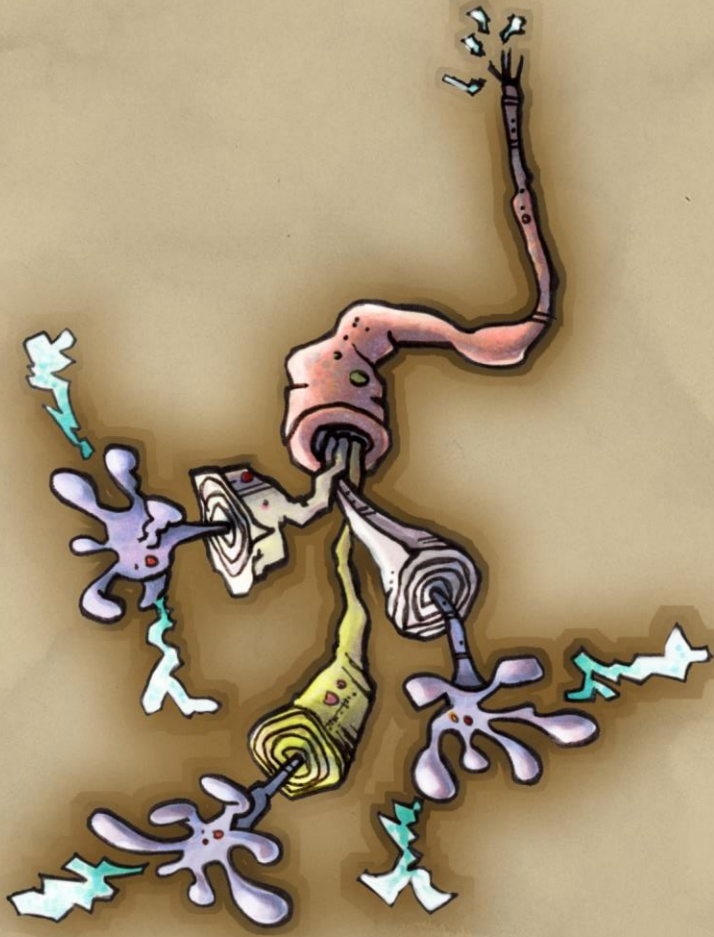
VAGUS NERVE



Nerve X – the tenth cranial nerve. Contains a mixture of sensory and motor nerves growing out from the brainstem. One branch, the recurrent laryngeal nerve, controls the movement of the vocal cords.



HYPOGLOSSAL NERVE



Carries motor signals from the brainstem to control tongue movements. The twelfth of the twelve cranial nerves, **nXII**.

