**3/3 – NEUROPIL; Events, which take place in the neuropil**

The other name of neuropil is the synaptic field. The reason for this is that the neuropil is a synaptically dense region, which is formed by unmyelinated axons, dendrites, and glial cell processes. It is easy to recognize, because it contains a relatively low number of cell bodies. Neuropil is located in the central nervous system and in some parts of the peripheral nervous system.

We can distinguish between structured and unstructured neuropil.  
Within the unstructured neuropil there may be plexiform or diffuse neuropil.  
In case of diffuse neuropil: processes spread through the neuropile to different degrees, they are extensively branched and rarely homogeneous. The main difference between the two is that diffuse neuropil is more heterogeneous, although synaptic connections were difficult to detect with light microscopy.

The structured neuropil is recognizable by the repetitive substructures formed by regular fiber configurations. It is usually part of complex sensory organs. There are also two types of structured neuropil: glomerular or stratified. Glomeruli may be in layers or in apparently unstructured clumps.   
Glomeruli are also found in the olfactory bulb. The olfactory bulb is an essential structure, located near the frontal part of the brain. This is the system of sense of smell. Within all glomeruli, the apical dendrites of mitral cells make contact with the axons of the receptor neurons. The sensory neuron axons form synapses in the glomeruli located in the olfactory bulb. These are capable of regeneration following regrowth of an olfactory sensory neuron.

Stratified neuropil is formed by precisely oriented neuron processes, and composed of regular, three-dimensional fiber lattice.

Events: neuropil integration involves excitatory or inhibitory synaptic transmission. Many of the neuropil association or motor elements receive continuous, presynaptic bombardment.   
Neuropil is involved in metabolic processes, when some of the released neurotransmitters, neuropeptides, enter the extracellular space via synaptic specialization. In this case, the concentration of the neurotransmitter can be measured. We can talk about non-synaptic neuronal transmission, which the Swedes called volume transmission.

The gaseous substances produced in the cells may diffuse and then act on the axon terminals. Similarly, when nutrients get into the intracellular space, nerve cells can take them up from there. They also have to take up oxygen and give off carbon monoxide, this is cellular respiration.

Sources:

Donald M. Maynard - Organization Of Neuropil; American Zoologist, 1962

A. J. Pinching And T. P. S. Powell - The Neuropil Of The Glomeruli Of The

Olfactory Bulb; J. Cell Sci. 9, 347-377 (1971)

[<https://en.wikipedia.org/wiki/Olfactory_bulb>](https://en.wikipedia.org/wiki/Olfactory_bulb)

<https://www.neuroscientificallychallenged.com/blog/know-your-brain-olfactory-bulb>

<https://users.itk.ppke.hu/neurobiologia>