The grey matter consists of neurons and neurites, neuroglia and blood vessels. It appears grey because of the abundance of neuronal cell bodies. The neuroglia form a dense network among the neuronal cell bodies and neurites, and are particularly condensed in the gel-like substance around the central canal. The neurons found within the grey matter are multipolar, varying in size, length and the arrangement of their axons and dendrites. Some neurons remain within a particular segment and are said to be intrasegmental, others are referred to as intersegmental as they are distributed through several segments.

For convenience, the arrangement of the spinal cord grey matter is defined as being in ventral, dorsal and lateral grey horns (columns).