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| Sommario/riassunto | The adult vertebrate central nervous system mainly consists of neurons, astrocytes, microglia cells, and oligodendrocytes. Oligodendrocytes, the myelin-forming cells of the CNS, are subjected to cell stress and subsequent death in a number of metabolic or inflammatory disorders, among which multiple sclerosis (MS) is included. This disease is associated with the development of large demyelinated plaques, oligodendrocyte destruction, and axonal degeneration, paralleled by the activation of astrocytes and microglia as well as the recruitment of peripheral immune cells to the site of tissue injury. Of note, viable oligodendrocytes and an intact myelin sheath are indispensable for neuronal health. For example, it has been shown that oligodendrocytes provide nutritional support to neurons, fast axonal transport depends on proper oligodendrocyte function, and mice deficient in mature myelin proteins eventually display severe neurodegeneration. This Special Issue contains a collection of highly relevant primary research articles as well as review articles focusing on the development, physiology, and pathology of the oligodendrocyte-axon-myelin unit. |