Glycosylation is a process in which sugar molecules (also known as glycans) are covalently attached to proteins or lipids, forming glycoproteins or glycolipids. This process occurs in most living organisms and is essential for many biological processes, including cell adhesion, signaling, and immune responses.

There are two main types of glycosylation: N-glycosylation and O-glycosylation. N-glycosylation involves the attachment of a sugar molecule to the amide nitrogen of an asparagine amino acid in the protein, while O-glycosylation involves the attachment of a sugar molecule to the hydroxyl group of a serine or threonine amino acid in the protein.

Glycosylation can affect the function, stability, and immunogenicity of proteins, and aberrant glycosylation has been implicated in several diseases, including cancer and neurodegenerative disorders. Researchers have also explored the use of glycosylation as a potential biomarker for disease diagnosis and prognosis.

The study of glycosylation is an active area of research, and advances in analytical methods, such as mass spectrometry, have enabled more detailed characterization of glycoproteins and glycolipids.