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Minireview

Biosynthetic and synthetic access to amino sugars

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ABSTRACT

Amino sugars are important constituents of a number of biomacromolecules and products of microbial secondary metabolism, including antibiotics. For most of them, the amino group is located at the positions C1, C2 or C3 of the hexose or pentose ring. In biological systems, amino sugars are formed due to the catalytic activity of specific aminotransferases or amidotransferases by introducing an amino functionality derived from L-glutamate or L-glutamine to the keto forms of sugar phosphates or sugar nucleotides. The synthetic introduction of amino functionalities in a regio- and stereoselective manner onto sugar scaffolds represents a substantial challenge. Most of the modern methods of for the preparation of 1-, 2- and 3-amino sugars are those starting from "an active ester" of carbohydrate derivatives, glycals, alcohols, carbonyl compounds and amino acids. A substantial progress in the development of region- and stereoselective methods of amino sugar synthesis has been made in the recent years, due to the application of metal-based catalysts and tethered approaches. A comprehensive review on the current state of knowledge on biosynthesis and chemical synthesis of amino sugars is presented.

Contents

1. Introduction

Amino sugars are sugar derivatives in which at least one of the hydroxyl functionalities is substituted with an amino group.

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