Molecular modelling as a tool for studying the disassembly of potentially leishmanicide-targeted dendrimer

Abstract
Molecular modelling studies were carried out to analyse which carbonyl group is the most vulnerable to the disassembly of potentially leishmanicide-targeted dendrimer. The dendrimers were designed using myo-inositol (core and directing group), d-mannose (directing group), l-malic acid (spacer and dendron) and hydroxymethylnitrofurazone (NFOH) as a bioactive agent. The molecular models were built containing one, two and three branches. For this preliminary analysis, physicochemical properties, such as electronic density distribution and steric hindrance regarding the carbonyl groups were evaluated, and the carbon atoms in the following carbonyl groups were considered: near the core (C-1), close to the directing group (C-2), in l-malic acid (C-3) and near the bioactive agent (C-4). The most probable targeted dendrimers showed the carbonyl close to the core as the most susceptible to a nucleophilic attack, except those molecular systems containing two branches with d-mannose as the directing group, which displayed the carbonyl group near NFOH as the most likely ester breaking point. (AU)