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# Exploitation of Glycobiology in Anti-Adhesion Approaches against Biothreat Agents

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**Abstract**

Pathogen adherence to a host cell is one of the first essential steps for establishing invasion, colonization and release of virulence factors such as toxins. Understanding the mechanisms used by pathogens and toxins to adhere and invade human cells could lead to the development of new strategies for preventing and controlling the spread of infectious diseases. This review focuses on carbohydrate-lectin interactions utilized by selected biothreat agents to bind and invade host cells. The principle of using anti-adhesion molecules, based on glycobiology research, has already been shown to be effective in the treatment of influenza. Therefore, translating the same principle to other biothreat agents that mediate invasion of a host cell through carbohydrate-lectin mechanisms is a very promising strategy. We investigate recent literature to highlight the latest developments in the field of glycobiology focused on inhibiting the initial steps of pathogen invasion, with examples for bacteria, toxin and virus interactions. The successful glycomimetics and glycoconjugates represent strategies for interruption of adhesion by single molecules and in multivalent systems against uropathogenic E. coli, several toxins (Shiga-like, cholera, botulinum) and well-known or emerging viruses (influenza, HIV, Ebola, and Zika). This review provides promising directions and prophylactic as well as therapeutic potential of anti-adhesive strategies against selected biothreat targets.

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