

40a The Design of Potent Liposome-Based Inhibitors of Anthrax Toxin

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Polyvalency – the simultaneous binding of multiple ligands on one biological entity to multiple receptors on another – is a phenomenon that is ubiquitous in nature. We are using a biomimetic approach, inspired by polyvalency, to design potent inhibitors of anthrax toxin. Since the major symptoms and death from anthrax are due primarily to the action of anthrax toxin, the toxin is a prime target for therapeutic intervention. We have used phage display to identify peptides that bind to the heptameric cell-binding subunit of anthrax toxin. We report that peptide-functionalized liposomes neutralize anthrax toxin *in vitro* at concentrations that are at least four orders of magnitude lower than those of the corresponding monomeric peptide. The liposome-based inhibitors can also neutralize anthrax toxin *in vivo*. The inhibitors developed during this work may enable the successful treatment of anthrax during the latter stages of the disease when antibiotic treatment is ineffective.