

The Medusa® Platform for the Controlled Delivery of Proteins, Peptides, and Molecules

Stephen H. Willard, Chief Executive Officer, Flamel Technologies, SA

Abstract

Medusa is a drug delivery platform that uses self-associated nanoparticles to effect the delivery of proteins, peptides, and other molecules at a controlled rate for periods of up to two weeks or more. The nanoparticles comprise polyglutamate and Vitamin E and are amphiphilic in water, with a hydrophobic core and a hydrophilic periphery. The nanoparticles contain unfilled hydrophobic bonding sites, such that hydrophobic therapeutic molecules introduced in a solution containing the nanoparticles self-associate to these sites. These hydrophobic molecules are gradually displaced upon subcutaneous injection. Because no covalent bond is created, the process does not involve denaturation of the molecule, which maintains full bioactivity.

The Medusa platform is cost-effective and scalable because the self-assembly process is quite efficient. Pharmacokinetics are well-controlled, which may explain results where lesser side-effects were observed as compared to pegylated interferon. Because no chemical engineering is necessitated, the process is widely applicable to molecules and types of molecules that may not be susceptible to competing technologies. Flamel is currently engaged in Medusa projects with four of the top ten and six of the top twenty pharmaceutical companies in the world.