Implantable Catheter for the Prevention of Cellular Occlusion

Published date: March 12, 2015

Technology description

Background

At present, central venous access devices have a high failure rate due to cellular obstructions or thrombus formation that can be lethal for patients. For conditions, such as hydrocephalus, a method to resolve these issues is in situ recanalization after revision surgery and in-patient neurosurgery, while for central venous access, there needs to be full replacement of these devices. Often times, patients need to be concomitantly treated with blood thinners, antibiotics, and other drugs that have other side effects. Therefore, both processes can be costly, risky, and painful for patients.

Technology Summary

To resolve such issues, researchers at Purdue University have looked at the well-known technique of magnetic nanoparticle induced hyperthermia for treatment of cancer cells and used this method to coat or infuse magnetic nanoparticles on implantable catheters. This would induce localized heat (hyperthermia) using external magnetic fields and help to remove or prevent cellular occlusion at the site of these catheters that are used for various medical procedures. This technology would also reduce the need for revision surgery or replacement of devices and can be used in situ and activated non-invasively, making it much safer and cost-effective.

Web Links

Application area

Implantable central venous access devices

Advantages

Induces localized heat (hyperthermia)
Removes/prevents cellular occlusion
Reduces need for surgery and replacement of devices

Institution

Purdue University

Inventors

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