

Study finds new nanomaterial could be breakthrough for implantable medical devices

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(PhysOrg.com) -- A team of researchers led by North Carolina State University has made a breakthrough that could lead to new dialysis devices and a host of other revolutionary medical implants. The researchers have found that the unique properties of a new material can be used to create new devices that can be implanted into the human body – including blood glucose sensors for diabetics and artificial hemodialysis membranes that can scrub impurities from the blood.

Researchers have long sought to develop medical devices that could be implanted into patients for a variety of purposes, such as monitoring glucose levels in diabetic patients. However, existing materials present significant problems. For example, devices need to be made of a material that prevents the body's proteins from building up on sensors and preventing them from working properly. And any implanted device also needs to avoid provoking an inflammatory response from the body that would result in the body's walling off the device or rejecting it completely.

Now a new study finds that nanoporous ceramic membranes may be used to resolve these issues. Dr. Roger Narayan – an associate professor in the joint biomedical engineering department of NC State and the University of North Carolina at Chapel Hill – led the research and says the nanoporous membranes could be used to "create an interface between human tissues and medical devices that is free of protein

buildup."

The new research, published in a special issue of *Biomedical Materials*, is the first in-depth study of the biological and physical properties of the membranes. The study suggests that the human body will not reject the nanoporous ceramic membrane. Narayan adds that this could be a major advance for the development of kidney dialysis membranes and other medical devices whose development has been stalled by poor compatibility with human tissues. Narayan was also the lead researcher on the team that first developed these new materials.

Citation: "Mechanical and biological properties of nanoporous carbon membranes", Dr. Roger J. Narayan et al., Aug. 8, 2008, in *Biomedical Materials*

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