

Nanoscience may hold key to surgical recovery

April 27 2011

(PhysOrg.com) -- New nano-systems developed in York may eventually help patients recover from surgery without the danger of allergic reactions to drugs.

Researchers from the University of York's Department of Chemistry have developed synthetic molecules capable of binding the chemical drug heparin, which they believe may provide an alternative to protamine.

During surgery patients are given heparin to thin the blood and prevent clotting. However, once <u>surgery</u> is finished, it is essential to remove the heparin and allow clotting so the patient can recover. Currently this is done with the drug protamine, a natural product extracted from shellfish which can cause serious side effects in some patients.

The synthetic molecules created in York are designed to self-assemble into nanometre-sized structures with similar dimensions to protamine and containing multiple heparin binding units.

The results of the early stage study, published in *Angewandte Chemie*, show that the new nano-systems are capable of binding heparin just as effectively as protamine.

Professor Dave Smith, from the Department of Chemistry, said: "Clearly there is lots of fundamental work still to be done before clinical application. However, we hope that this approach may eventually yield



biocompatible and degradable <u>heparin</u> binders which will help surgical recovery without any of the side effects which can be caused by protamine."

More information: The full article, "Self-Assembling Ligands for Multivalent Nanoscale Heparin Binding" by David Smith, Ana C.Rodrigo, Anna Barnard and James Cooper is published in *Angewandte Chemie* at doi:10.1002/ange.201100019 for the German edition and doi:10.1002/anie.201100019 for the international edition.

Provided by University of York

Citation: Nanoscience may hold key to surgical recovery (2011, April 27) retrieved 27 April 2024 from <u>https://phys.org/news/2011-04-nanoscience-key-surgical-recovery.html</u>

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