



NovaUCD

## Technology Transfer Opportunity

### Novel Fine Material Production Method

#### **OPPORTUNITY:**

Novel fine material production method - controlled deposition of functional materials on the surface of micro and nanoparticles.

#### **Description of Technology:**

Traditional methods for patterning of nanoparticles use Langmuir-Blodgett adsorption techniques and direct evaporation processes. These methods indiscriminately deposit a monolayer of material on the surface of the particle and thus confine its specificity and functionality to a single substrate only.

This novel method selectively patterns micro- and nanoparticles with functional molecules, such that a complexity of functional architectures can be built on the particle surface, thereby providing specificity to multiple substrates and also with a specific directional selectivity. A porous membrane is used as a template to anchor micro- or nanosized spherical particles. Regions of the sphere's surface are then selectively patterned with other nanoparticles of a desired property through a self-assembly process.

#### **Value Proposition:**

Many materials are now commercially available in micro- and nanoparticle sizes providing unique properties, which are attributable to their micro- and nano-dimensions. However, capturing these unique properties in a material format which can be readily transferred into a commercial application is a challenge and many end users are left to develop their own custom required materials de novo.

The process offered here can be readily used by fine material producers to open up a whole new platform of functional materials in the form of custom designed micro- and nanoparticles selectively patterned with functional molecules, providing specificity to multiple substrates combined with directional selectivity.

Selectively patterned particles can be used to form commercially interesting materials such as nanowires, nanofilms or nanocomposites.

Patterning materials can be chosen from inorganic particles such as gold, silver, metal oxides, catalytic materials, etc., or from organic and biomolecules such as dyes, proteins, enzymes, DNA, etc.

#### **Market:**

Medical Diagnostics, Drug Screening, Drug Delivery, Batteries, Information Storage, Displays, Solar Cells, Hygiene, Cosmetics, Food, Security.

#### **Inventor:**

Professor Donald Fitzmaurice, UCD School of Chemistry and Chemical Biology.

#### **Publications:**

Nagle, L. et al, Nanolett. 2003, 3, 51.  
Fitzmaurice, D. Adv. Mat. 2003, 15, 933.

#### **Status:**

A PCT patent application has been filed on 16th August 2002, designating the USA, EPO contracting states and Singapore. Publication No.: WO2004/016696.

#### **Opportunity Sought:**

Licenses sought for exploitation of the technology on a field of application basis.

#### **Contact:**

Dr François Pichot, Project Manager, Technology Transfer, NovaUCD, Belfield Innovation Park, UCD, Belfield, Dublin 4.

t: +353 1 716 3725  
e: francois.pichot@ucd.ie  
w: www.ucd.ie/nova