Irish Drug Delivery Network (IDDN)

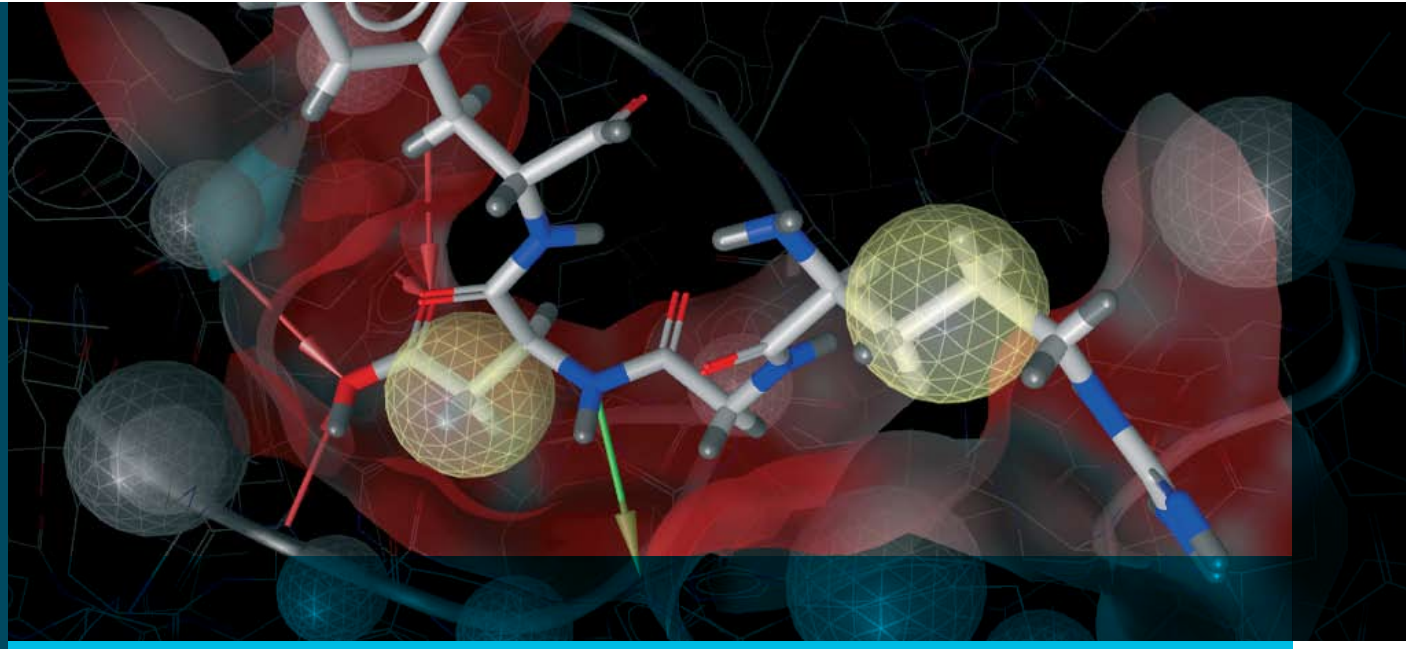

IMAGE *by Norman Davy*

The IDDN is a network of scientists undertaking research into replacing injections with oral and inhaled versions of biotech molecules (e.g. proteins and gene-based medicines).

ABOUT IDDN

The Irish Drug Delivery Network (IDDN) brings together the three Schools of Pharmacy in Ireland and the UCD Conway Institute in a centre of excellence for research into drug delivery. It is led by Professor David Brayden, UCD School of Agriculture, Food Science and Veterinary Medicine and its industry partners include Genzyme Ireland, Sigmoid Biotechnologies and Warwick Effect Polymers.

FUNDING

The Irish Drug Delivery Network has received a major investment of €5.2 million from Science Foundation Ireland as a Strategic Research Cluster. An additional €2.2 million in funding comes from industry partners bringing the overall investment in excess of €7.4 million over the coming five years.

KEY AREAS OF RESEARCH

- **Oral and airway delivery of peptides**
- **Gene delivery research including siRNA for inflammatory diseases**

OUTPUTS

With a critical mass of expertise, scientists in the IDDN hope to create new and better methods of delivering biopharmaceuticals.

COLLABORATION

IDDN is based on a collaboration between scientists in the UCD Conway Institute and the Schools of Pharmacy in Trinity College Dublin, Royal College of Surgeons in Ireland, and University College Cork.

WWW.UCD.IE/IDDN

Clique

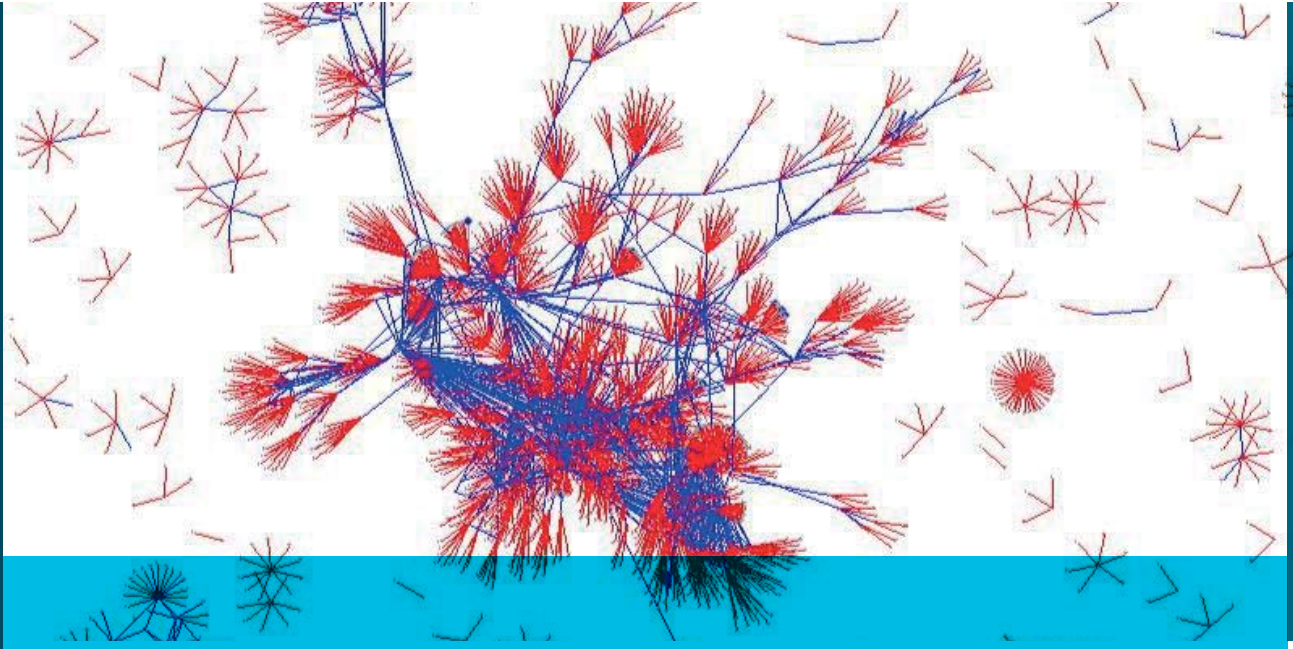

IMAGE Force directed visualization *by Dr Aaron Quigley*

Clique is a Science Foundation Ireland Strategic Research Cluster focused on graph and network analysis and visualisation.

ABOUT CLIQUE

Launched in February 2009, the aim of Clique is to develop software for analysing social and biological networks of objects and the relationships and interactions between them. Although two quite different application areas, at a data level the problems have similar structures and the practice of applying techniques developed in one area to the other is well established and has had a huge impact in recent years.

FUNDING

In February 2009, the Irish government announced €3.56 million in research funding for Clique; in addition to funding received from partner companies, the total industry and SFI funding is in excess of €5 million.

KEY AREAS OF RESEARCH

Clique aims to answer questions that have a direct impact on society, such as:

- **Does credit card fraud have a characteristic pattern of transactions?**
- **Can we identify bad behaviour such as spamming or bullying based on the analysis of communications patterns?**
- **Can we gain insights into how information disseminates in networks?**

OUTPUTS

The technology developed will be applied in internet services, fraud detection and bioinformatics.

COLLABORATION

Clique works with a range of industry partners including IBM, Idiro and Norkom. Its academic partners are University College Dublin, DERI at NUI Galway and other academics around the world.

WWW.CLIQUECLUSTER.ORG

Clique

UCD DUBLIN

Financial Mathematics Computation Research Cluster (FMC^2)

IMAGE *by Davide Bau*

The Financial Mathematics Computation Cluster (FMC^2) will create a leading centre of financial research which will underpin the future development of, and employment growth in, the international financial services sector in Ireland.

ABOUT FMC^2

Launched in October 2009 with funding of €4.1 million, FMC^2 is part of the Science Foundation Ireland Strategic Research Cluster (SRC) programme. FMC^2 brings together complementary expertise in financial mathematics, financial economics and computer science to create a multi-disciplinary research programme in asset and risk management.

FUNDING

Launched on 14 October 2009 with funding of €4.1 million, FMC^2 is part of the Science Foundation Ireland Strategic Research Cluster (SRC) programme.

KEY AREAS OF RESEARCH

There are two complementary strands to the research activities of the cluster. The first covers such issues as optimal asset allocation, risk management of the resulting investment portfolios, performance measurement of fund managers, algorithmic trading and efficient execution dealing. The cluster will also develop new software tools for these tasks.

The second stream of research focuses on increasing our understanding of risk in financial and other investment markets (including property) and the development of better metrics and software tools to manage this risk. This stream will also examine pension risk in order to develop better methods to manage long term pension investment risk.

The academic Principal Investigators involved in FMC^2 are Professor Anthony Brabazon, Professor Gregory Connor, Professor John Cotter, Dr David Edelman, Professor Paolo Guasoni and Dr Michael O'Neill.

COLLABORATION

The Financial Mathematics Computation Cluster (FMC^2) is a collaboration between University College Dublin, Dublin City University, NUI Maynooth and industry partners.

WWW.FMC-CLUSTER.ORG

FMC^2

UCD DUBLIN

Centre for BioNanoInteractions (CBNI)

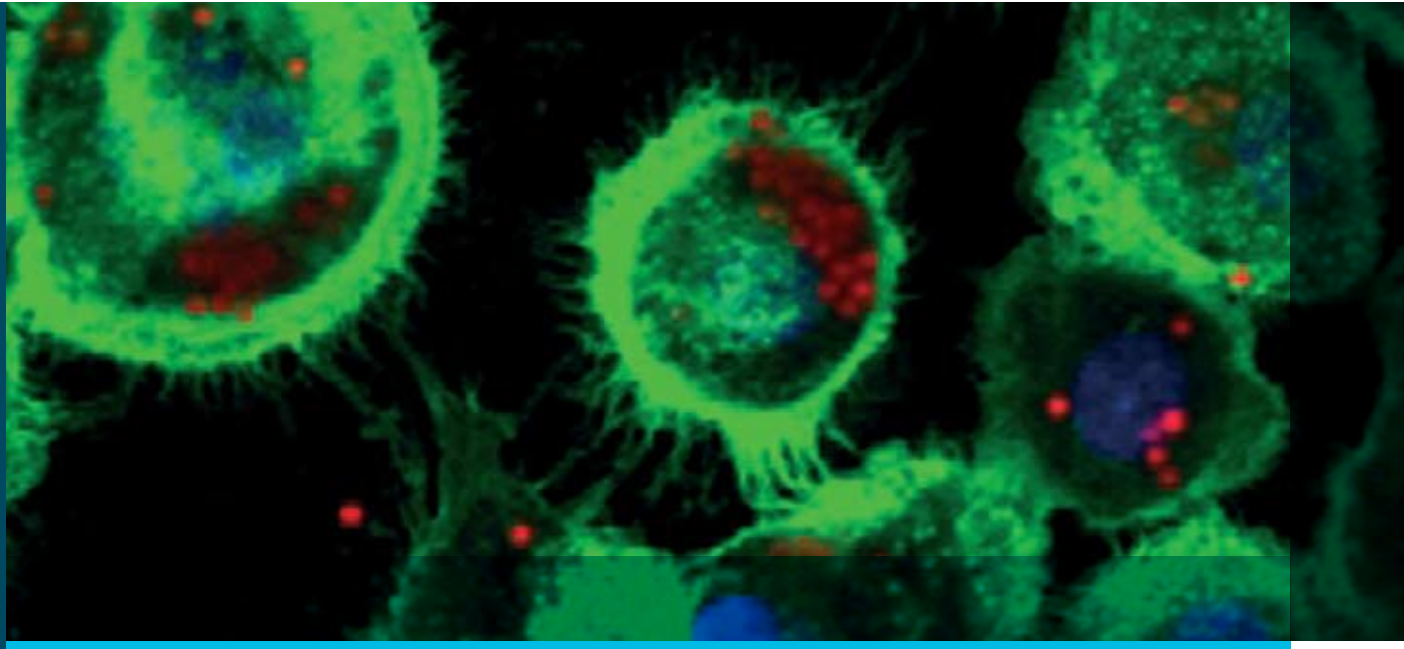

IMAGE Tasty beads *by Juan Varela*

CBNI is Ireland's National Platform for BioNanoInteraction science, and draws together specialists from universities, institutes and companies; the centre is a multi-disciplinary platform for nanotoxicology and nanomedicine.

ABOUT CBNI

Nanoscience has the potential to revolutionise and benefit many aspects of human society, especially in the fields of information technology and medicine. As one of the world's leading centres of knowledge for bionanointeractions, applied to the fields of nanosafety, nanobiology and nanomedicine, the CBNI is pioneering many of the new techniques and approaches in this area.

FUNDING

Working as a virtual centre since 2005, the CBNI was awarded funding from Cycle 4 of the Programme for Research in Third Level Institutions in October 2007, which marked the official start date of the centre. In addition to government funding, core funding for the centre comes from Irish Universities, the European Union and US sources.

KEY AREAS OF RESEARCH

- **Interactions between nanoparticles and the living world**
- **NanoPhotonics, nanoelectronics & nanobioscience**
- **Environmental impact of nanoparticles**
- **Nanoparticles and neurodegenerative diseases**

RESEARCHERS

Currently the centre has 4 Principal Investigators and 4 associated Principal Investigators as well as multiple collaborators across 8 Schools in UCD. The Centre is led by Professor Kenneth Dawson.

COLLABORATION

In 2008, CBNI was part of a winning bid awarded by the National Science Foundation and the US Environmental Protection Agency to establish two centres for the Environmental Implications of Nanotechnology, led by UCLA and Duke University. It is also a member of the Integrated NanoScience Platform for Ireland consortium (INSPIRE).

WWW.CBNI.EU

cbni

UCD DUBLIN

Reproductive Biology Research Cluster

IMAGE Waiting to Develop
by Claire Moran

The Reproductive Biology Research cluster is a Science Foundation Ireland Strategic Research Cluster that comprises a group of internationally recognised scientists from UCD and Teagasc whose research interests focus on fertility in domestic animals using cutting edge technologies.

ABOUT THE REPRODUCTIVE BIOLOGY RESEARCH CLUSTER

This research group comprises over 60 members and research is conducted at UCD's Belfield Campus and Lyons Research Farm, and at Teagasc's research centres. The cluster is led by Professor Alexander Evans of the UCD School of Agriculture, Food Science and Veterinary Medicine.

FUNDING

The Cluster has recently been awarded a multi-million Euro grant from Science Foundation Ireland (SFI) to address specific aspects of female infertility, focusing on events in the days immediately before and after fertilisation.

RESEARCH

The overall objective is to identify genes, proteins and other complex molecules, and their expression patterns, in bovine ovarian follicles that are responsible for, or are markers of, infertility. Particular focus is on those molecules that are responsible for failure of the initiation and establishment of pregnancy in the days following fertilisation.

OUTPUTS

The knowledge generated will provide opportunities to develop new diagnostics and therapeutics to improve reproductive efficiency in cattle, in the short term, and other mammalian species in the longer term.

WWW.UCD.IE/AGFOODVET/REPRODUCTIVE_BIOLOGY.HTM

UCD DUBLIN

Solar Energy Conversion Research Cluster

IMAGE The touch of the sun: life!
by Erica Cacciotti

The Solar Energy Conversion Cluster was officially launched in 2009 with a mission to develop new materials and synthesise devices that mimic the steps involved in natural photosynthesis.

RESEARCH

Harnessing the "free energy" of the sun, together with the application of engineering, chemistry, biochemistry, physics and computational modelling, the cluster is directing its research to sustainable energy production.

The research group's work programme is subdivided into four research strands with tasks which parallel the sequence of steps observed in photosynthesis. The first three strands focus on the fabrication and characterisation of energy related materials and the objectives of the fourth strand will focus on the development of commercially viable solar energy modules.

THE TEAM

The Strategic Research Cluster is led by Director, Professor Don MacElroy, UCD School of Chemical and Bioprocess Engineering; the four Research Strand Leaders are Prof Edmond Magner, Prof Don MacElroy, Prof Han Vos and Prof John T Sheridan.

In addition, the team comprises a number of academic funded researchers, collaborators, postdoctoral researchers, PhD and MSc research students.

FUNDING

The Solar Energy Conversion (SEC) Cluster has received funding through Science Foundation Ireland's Strategic Research Programme of €5.3 million over 5 years.

COLLABORATION

Industry partners to date include Airtricity, Celtic Catalysts and SolarPrint.

WWW.SECCLUSTER.IE

SEC

UCD DUBLIN