

A licensing or co-development opportunity



Polymer with improved transfection efficiency, reduced cytotoxicity and significant potential for gene therapy application

Principal Investigators and Institution:

Dr. Wenxin Wang, Network of Excellence for Functional Biomaterials (NFB), NCBES, NUI Galway, Ireland.

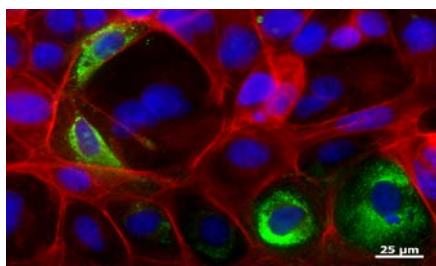
Market Opportunity:

The demand for reagent-based genetic transfection systems has expanded rapidly in the last decade, currently standing at \$250M per year and rising¹. Reagents such as Lipofectamine™2000, Polyethyleneimine, SuperFect and FuGENE® are now hugely important tools for R&D scientists. Indeed, Lipofectamine® reagents, owned by Life Technologies, have become the most referenced transfection reagents with over 42,000 citations to date. Despite market saturation, limitations in terms of transfection efficiency, cellular toxicity and clinical application mean the improvement drive is ongoing.

The translation of 'Gene Therapy' developments to clinical application has to date been severely restricted by mutagenesis concerns with virus-based delivery systems and efficiency issues with currently available chemical-based reagents.

Technology Description:

At NUIG, we have recently developed a synthesis platform suitable for the production of specifically-designed cationic polymers. We have demonstrated these polymers to deliver improved transfection efficiency and cytotoxicity performance when compared to currently available gold standard gene delivery reagents. 'NFBfect' is an example of one such polymer.



Expression of collagen VII (green) in Collagen VII deficient keratinocytes after transfection with **NFBfect**.

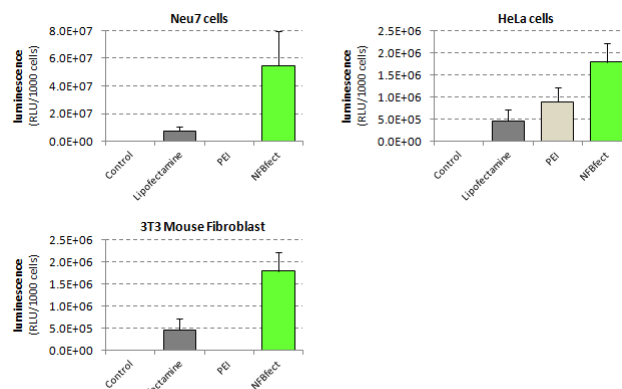
Our platform is capable of synthesising polymers with impressive biodegradable properties [intracellular] and the specific addition of modifiable functional groups, making antibody (or indeed moieties of a variety of other applications) attachment a genuine prospect.

¹ Frost & Sullivan, www.genomeweb.com

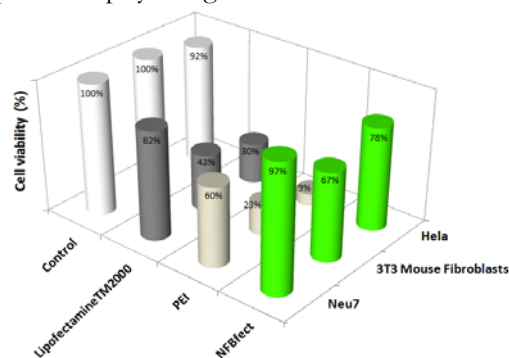
Competitive Advantage:

In comparison to commercially available transfection agents the NUIG technology has:

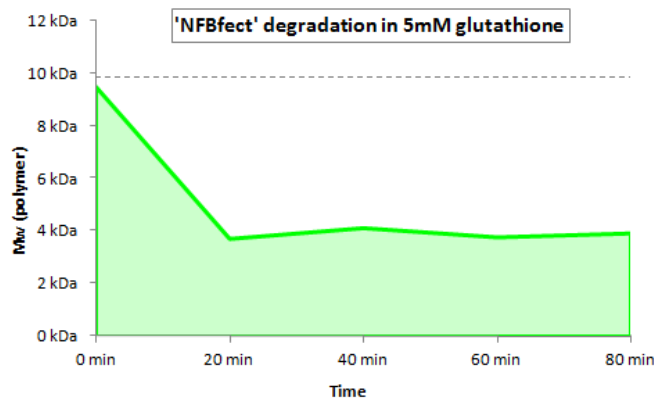
1. **Superior Transfection Efficiency** - transfection efficiency in a variety of cell types demonstrates superior luciferase expression compared to PEI and Lipofectamine™2000 [Polymer/DNA @ optimal w/w].



2. **Reduced Toxicity** – aided by superior biodegradability when placed in physiological conditions.



In physiological conditions (glutathione), NFBfect degrades within minutes.



3. **Function Group Modification and Gene Therapy Potential.**

To discuss this technology further please contact:

Dr. Seamus Coyne,

Commercialisation Executive, Ignite Technology Transfer, National University of Ireland Galway, Ireland. Phone: +353-91 495663 Fax: +353-91-526388.

[Email: seamus.coyne@nuigalway.ie](mailto:seamus.coyne@nuigalway.ie)