

# ClickGene

## Click Chemistry for Future Gene Therapies to Benefit Citizens, Researchers and Industry

### Background

Gene therapy is expected to play a key role in next-generation medicine by correcting the underlying genetic causes of disease, thereby facilitating personalised medicine. As this technology can address a wide range of medical conditions, along with finding substantive application within plant genetics, extensive growth in this sector of the biopharmaceutical and agricultural industry are widely predicted. Thus, to enhance the human understanding and application of gene therapy, highly qualified experts of this field are urgently required.

Furthermore, current gene therapy methods possess undesirable side effects, including insertional mutagenesis, toxicity, low efficiency and off-target cutting. Questions also remain regarding the optimal methods for delivering nucleases into cells and tissues. These limitations will be addressed through the original and innovative approach of the ClickGene network, which will provide training to 14 PhD students in an exciting academia-industry collaboration.

### Objectives

ClickGene's main research objective is to develop new materials and methodologies for site-selective genetic engineering by training researchers within an innovative, multi-disciplinary and entrepreneurial environment so that they can meet the challenges facing future scientific leaders in Europe's industry.

More specifically, the research of this project will:

- Provide world-class training to 14 PhD students in the areas of synthetic click chemistry, nanotechnology, liposomal drug delivery and nucleic acid (DNA and RNA) chemistry
- Generate scientific excellence and technological innovation in the area of gene silencing and epigenetic base detection

In particular, the European expertise presently available in DNA-based chemical and biotechnology fields needs to be combined to provide young researchers with the appropriate knowledge and know-how to address the gap associated with rapid scientific developments in epigenetics. ClickGene drives efforts to establish multidisciplinary and methodologically strong environments in order to foster scientific leaders of our future.

### Funding Programme:



Horizon 2020 Framework Programme of the European Union

### Project Duration:

01/01/2015-31/12/2018

### Project Budget:

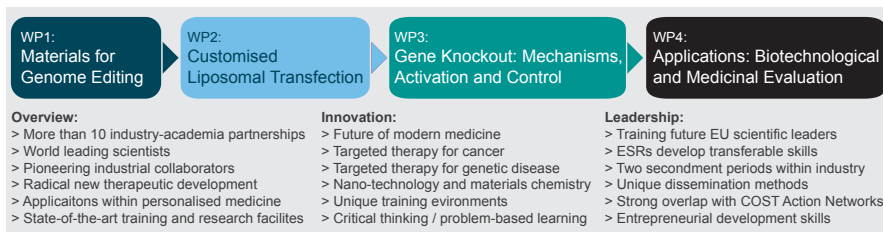
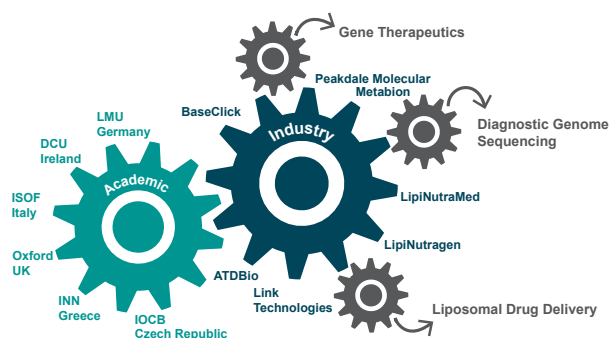
3.7 million euro

### Project Website:

[www.clickgene.eu](http://www.clickgene.eu)

## Activities

ClickGene's research is based on four work packages and three main scientific objectives: Gene therapeutics, diagnostic genome sequencing, and liposomal drug delivery.



## Impact

ClickGene will educate the next generation of biomaterials chemists with specific expertise in click chemistry and cutting edge application areas of gene therapy, nano-technology and biological diagnostics. 14 researchers will emerge with unique skill sets and multi-disciplinary training from leading academic and industrial environments. This will be achieved through individualised career guidance, applied learning, industry and academic networking, close collaboration with COST, a framework to implement new research with interdisciplinary vision, as well as through the integration of non-academic beneficiaries including leading SMEs that are linked to ClickGene's partner universities.

The results of ClickGene will have an impact on the general public, on industry and on future research:

- The general public will benefit of new gene therapies, drug delivery and biodiagnostics for personalised medicine.
- A new generation of scientists with new sets of techniques to combine will be crucial for future research in click chemistry, gene therapy and biological diagnostics.
- A new generation of chemists will boost the European chemical and biotechnology and agricultural industries.

### Project Coordinator:

Dr Andrew Kellett,  
 Dublin City University, IE  
[andrew.kellett@dcu.ie](mailto:andrew.kellett@dcu.ie)

### Project participants:

- Ludwig Maximilian University Munich, DE
- Oxford University, UK
- National Center for Scientific Research "Demokritos", GR
- National Research Council, IT
- Institute of Organic Chemistry and Biochemistry ASCR, CZ
- ATDBio Ltd, UK
- baseclick GmbH, DE
- LipiNutraGen srl, IT

### Subcontractor:

- accelopment AG, CH