Nucleic Acids for Future Gene Editing, Immunotherapy and Epigenetic Sequence Modification (MSCA ITN)

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Nucleic acid (NAs) therapies are predicted to yield major advances in the treatment of human disease and new approaches in NA design are required to extend the boundaries of today`s gene editing technologies, cancer immunotherapies, and epigenetic base manipulation tools. Current gene editing technologies involving CRISPR-Cas9, despite their wide applicability, have serious limitations involving off-target or prolonged effects that produce mutations, insertions, and deletions leading to undesired therapeutic outcomes. Questions also remain regarding the development and delivery of Nas for manipulation of T-cells, now seen as the new paradigm in cancer research. NATURE-ETN will meet this challenge by engineering new biomaterials and therapies to extend the boundaries of

1. Gene editing technology
2. Cancer immunotherapy
3. Epigenetic base manipulation.

Our research programme involves world-leading chemists and biologists in combination with high-tech/biotech SMEs and industry partners. We will use our combined expertise in NA chemistry, DNA crystallography, materials chemistry, cell culture, and epigenetic sequencing to develop an outstanding multi-disciplinary environment were 15 Early Stage Researchers will receive unrivalled research training in the most exciting gene therapy research today. The intersectoral training provided will encompass scientific and transferable skills, an understanding of industry, and features targeted workshops in sequencing and genomics along with quality/business management and future career planning. NATURE-ETN will leverage breakthrough discoveries—some originating from our own laboratories—to provide training excellence to give our fellows a deep skillset in the translation of basic research into high functioning commercial NA biomaterials. NATURE-ETN will develop the next generation of pioneering scientific leaders in Europe where they will grow our commercial need for disruptive technologies in 21st century medicine.