

Technology Opportunity, Ref. No. UB-22/025

Antisense Oligonucleotides (ASOs) inhibitors for long noncoding RNA (lncRNA) targets in Non-Small Cell Lung Cancer (NSCLC)

Inventors performed a screen to discover lncRNAs that promote cancer hallmarks in Non-Small Cell Lung Cancer (NSCLC) cells. Inventors developed and validated antisense oligonucleotides (ASOs) capable of degrading these targets. The lncRNAs targets and ASOs against them constitute the invention.

Keywords	long non-coding RNA, lncRNA, Non-Small Cell Lung Cancer, NSCLC, KRAS, Antisense Oligonucleotides, ASO
Inventors	Rory Johnson, Roberta Esposito, Taisia Polidori
Reference	Multi-hallmark long noncoding RNA maps reveal non-small cell lung cancer vulnerabilities (Pre-print)
Invention	Long noncoding RNAs (lncRNAs) are widely dysregulated in cancer. The inventors employed pooled CRISPR deletion to perturb all 831 lncRNAs in KRAS-mutant non-small cell lung cancer (NSCLC) and measured their contribution to proliferation, chemoresistance and migration. A follow-up antisense oligonucleotide (ASO) screen shortlisted two candidates, Cancer Hallmarks in Lung lncRNA (CHiLL 1&2), whose knockdown consistently suppressed cancer cell growth in a variety of 2D and 3D tumour models. Molecular phenotyping confirmed on-target activity and revealed that CHiLL 1&2 control cellular-level phenotypes via distinct transcriptional networks converging on common oncogenic pathways.
Data Status	In-vitro, in vivo planned in 2022
Remarks	The PI (Rory Johnson) moved to University College Dublin and will continue the work and is open to start a collaboration with industrial partner.
Patent Status	EP 21/202363.4 (priority date 13 October 2021) - Nucleic Acid Agents for Treatment of Non-Small-Cell Lung Cancer
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