



Targeting Non-Coding RNAs with Gene Editing Tool System in Hepatocellular Carcinoma Cell Lines

Thesis

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List of Abbreviations

Abb.	Full term
<i>3'-UTR</i>	<i>3' untranslated region</i>
<i>AASLD</i>	<i>American Association for the study of liver disease</i>
<i>ADAMTS9-AS2</i>	<i>ADAMTS9 Antisense RNA 2</i>
<i>AFP</i>	<i>Alpha-fetoprotein</i>
<i>AGO</i>	<i>Argonaute</i>
<i>AJCC</i>	<i>American Joint Committee on Cancer</i>
<i>ALT</i>	<i>Alanine Aminotransferase</i>
<i>ARKs</i>	<i>Aurora kinases</i>
<i>ASIR</i>	<i>Age-standardized incidence rate</i>
<i>AST</i>	<i>Aspartate Aminotransferase</i>
<i>ATL</i>	<i>Adult T-cell leukemia / lymphoma</i>
<i>BCLC</i>	<i>Barcelona Clinic Liver Cancer</i>
<i>CAFs</i>	<i>Cancer associated fibroblasts</i>
<i>cas9</i>	<i>CRISPR associated protein 9</i>
<i>CBC</i>	<i>Complete blood count</i>
<i>CCAT1</i>	<i>Colorectal cancer associated transcript 1</i>
<i>Cdks</i>	<i>Cyclin-dependent kinases</i>
<i>cDNA</i>	<i>Complementary DNA</i>
<i>ceRNAs</i>	<i>Competing endogenous RNAs</i>
<i>CHC</i>	<i>Chronic hepatitis C</i>
<i>CHC</i>	<i>Chronic viral hepatitis c</i>
<i>circRNA</i>	<i>Circular RNA</i>
<i>ciRNAs</i>	<i>Intronic circular RNA</i>
<i>CLIP</i>	<i>Cancer of liver Italian program</i>
<i>CRISPR</i>	<i>Clustered regularly interspaced short palindromic repeat</i>
<i>CRP</i>	<i>C-reactive protein</i>
<i>CSMD1</i>	<i>CUB and Sushi Multiple Domains 1</i>
<i>CT scan</i>	<i>Computerized Tomography</i>
<i>CT</i>	<i>Threshold cycle</i>
<i>CTLA-4</i>	<i>Cytotoxic T-lymphocyte-associated protein-4</i>
<i>CTLs</i>	<i>Cytotoxic T lymphocytes</i>

List of Abbreviations cont...

Abb.	Full term
<i>DCs</i>	<i>Dendritic cells</i>
<i>DEPC</i>	<i>Diethyl pyrocarbonate</i>
<i>DGCR8</i>	<i>Drosha and the DiGeorge critical region 8</i>
<i>DMD</i>	<i>Duchenne muscular dystrophy</i>
<i>DNA</i>	<i>Deoxyribonucleic acid</i>
<i>DNMT</i>	<i>DNA methyltransferase</i>
<i>DNTP</i>	<i>Deoxynucleotide Triphosphate</i>
<i>DSB</i>	<i>Double strand break</i>
<i>dsRNA</i>	<i>Double stranded RNA</i>
<i>dT</i>	<i>Deoxy-thymine nucleotides</i>
<i>E2F2</i>	<i>E2 Transcription Factor 2</i>
<i>EcircRNAs</i>	<i>Exonic circular RNA</i>
<i>EGF</i>	<i>Epidermal growth factor</i>
<i>EIciRNAs</i>	<i>Exon-intron circular RNAs</i>
<i>ELISA</i>	<i>Enzyme-linked immunosorbent assay</i>
<i>EMT</i>	<i>Epithelial–mesenchymal transition</i>
<i>ER+</i>	<i>Estrogen-receptor-positive</i>
<i>ERK</i>	<i>Extracellular signal-regulated kinase</i>
<i>ESMO</i>	<i>European Society for Medical Oncology</i>
<i>FN</i>	<i>False negative</i>
<i>FP</i>	<i>False positive</i>
<i>GAP-dh</i>	<i>Glyceraldehyde 3- phosphate dehydrogenase</i>
<i>GBD</i>	<i>Global Burden of Disease</i>
<i>GPC3</i>	<i>Glypican-3</i>
<i>gRNA</i>	<i>Guide RNA</i>
<i>HACAT</i>	<i>Human Keratinocyte cell line</i>
<i>HBV</i>	<i>Hepatitis B virus</i>
<i>HCC</i>	<i>Hepatocellular Carcinoma</i>
<i>hCSCs</i>	<i>Hepatic cancer stem cells</i>
<i>HCV</i>	<i>Hepatitis C virus</i>
<i>HDR</i>	<i>Homology directed repair</i>
<i>HRP</i>	<i>Horseradish Peroxidase</i>

List of Abbreviations *cont...*

Abb.	Full term
<i>IBD</i>	<i>Irritable bowel syndrome</i>
<i>IFN-β</i>	<i>Interferon B</i>
<i>IKKα</i>	<i>Inhibitor of nuclear factor kappa-B kinase subunit alpha</i>
<i>IL-1</i>	<i>Interleukin 1</i>
<i>IL-1β</i>	<i>Interlukin 1 beta</i>
<i>INR</i>	<i>International normalized ratio</i>
<i>Kb</i>	<i>Kilo base</i>
<i>LAT</i>	<i>Linker for activation of T cells</i>
<i>LCK</i>	<i>Leukocyte C-Terminal Src Kinase</i>
<i>Lnc-RoR</i>	<i>Long non-coding RNA regulator of reprogramming</i>
<i>LPS</i>	<i>Lipopolysaccharide</i>
<i>M2</i>	<i>Macrophage type 2</i>
<i>MAGI2-AS3</i>	<i>MAGI2 Antisense RNA 3</i>
<i>MAITs</i>	<i>Mucosal associated invariant T cells</i>
<i>MALAT1</i>	<i>Metastasis-associated lung adenocarcinoma transcript 1</i>
<i>MAPK</i>	<i>Mitogen-activated protein kinases</i>
<i>MEG3</i>	<i>Maternally expressed 3</i>
<i>MHC</i>	<i>Major histocompatibility complex</i>
<i>MIG2</i>	<i>Cell Migration-Inducing Gene 2 Protein</i>
<i>miRNAs</i>	<i>Micro RNAs</i>
<i>MNs</i>	<i>Meganucleases</i>
<i>MREs</i>	<i>miRNA-recognizing elements</i>
<i>MRI</i>	<i>Magnetic Resonance Imaging</i>
<i>ncRNAs</i>	<i>Non coding RNAs</i>
<i>NF-$\kappa\beta$</i>	<i>Nuclear factor-kappa beta</i>
<i>NHEJ</i>	<i>Non-homology end joining</i>
<i>NIK</i>	<i>NF-κB inducing kinase</i>
<i>NK</i>	<i>Natural killer cells</i>
<i>NPV</i>	<i>Negative Predictive Value</i>
<i>Oct4</i>	<i>Octamer-binding transcription factor 4</i>

List of Abbreviations *cont...*

Abb.	Full term
<i>opti-MEM</i>	<i>Improved Minimal Essential Medium</i>
<i>PAM</i>	<i>Protospacer adjacent motif</i>
<i>PD-1</i>	<i>Programmed cell death protein 1</i>
<i>PD - L1</i>	<i>Programmed death-ligand 1</i>
<i>PERVs</i>	<i>Porcine endogenous retroviruses</i>
<i>PPV</i>	<i>Positive Predictive Value</i>
<i>PTEN</i>	<i>Phosphatase and tensin homolog</i>
<i>PTENP1</i>	<i>Phosphate and tension homolog pseudogene 1</i>
<i>qPCR</i>	<i>Quantitative Real Time Polymerase Chain Reaction</i>
<i>ReLA</i>	<i>REL-associated protein</i>
<i>RFTN1</i>	<i>Lipid Raft Linker 1</i>
<i>RISC</i>	<i>RNA-induced silencing complex</i>
<i>RNA</i>	<i>Ribonucleic acid</i>
<i>RNase</i>	<i>Ribonuclease</i>
<i>RNPs</i>	<i>Ribonucleoprotein</i>
<i>ROC</i>	<i>Receiver Operating Characteristics curve</i>
<i>ROS</i>	<i>Reactive oxygen species</i>
<i>RQ</i>	<i>Relative quantification</i>
<i>RT-PCR</i>	<i>Reverse transcription polymerase chain reaction</i>
<i>SD</i>	<i>Standard deviation</i>
<i>siRNAs</i>	<i>Small interfering RNAs</i>
<i>SNORD68</i>	<i>Small Nucleolar RNA, C/D Box 68</i>
<i>snRNAs</i>	<i>Small nuclear RNAs</i>
<i>SOX2</i>	<i>sex determining region Y-box 2</i>
<i>TALENs</i>	<i>Transcription activator-like effector nucleases</i>
<i>TAMs</i>	<i>Tumor associated macrophages</i>
<i>TCR</i>	<i>T cell receptor</i>
<i>Tfh</i>	<i>T follicular cells</i>
<i>TFs</i>	<i>Transcription factors</i>
<i>TGFB1</i>	<i>Transforming growth factor beta 1</i>

List of Abbreviations *cont...*

Abb.	Full term
<i>Th</i>	<i>T helper cells</i>
<i>TICAM1</i>	<i>Toll like Receptor Adaptor Molecule 1</i>
<i>Tim-3</i>	<i>T-cell immunoglobulin and mucin domain-3</i>
<i>TLR4</i>	<i>Toll-like receptor 4</i>
<i>TMB</i>	<i>Tetramethylbenzidine</i>
<i>TME</i>	<i>Tumor microenvironment</i>
<i>TN</i>	<i>True negatives</i>
<i>TNF-α</i>	<i>Tumor necrosis factor-α</i>
<i>TP</i>	<i>True positive</i>
<i>TP53</i>	<i>Tumor protein 53</i>
<i>TRBP</i>	<i>TAR RNA-binding protein</i>
<i>trcrRNA</i>	<i>Trans-activating CRISPR RNA</i>
<i>Tregs</i>	<i>Regulatory T cells</i>
<i>TRMs</i>	<i>Tissue resistant memory T cells</i>
<i>US</i>	<i>Ultrasonography</i>
<i>ZFNs</i>	<i>Zinc finger nucleases</i>