## Recent patent applications in genome editing

| Patent number | Description | Assignee | Inventor | Publication date |
|---|---|---|---|---|
| US20150093802 | New zinc finger proteins and zinc finger nuclease useful in repairing the cystic fibrosis transmembrane conductance regulator gene. | University of Iowa Research Foundation (Iowa City, IA, USA), Massachusetts General Hospital (Boston) | McCray P, Maeder M, Joung JK | 4/2/2015 |
| US20150087067 | Methods and compositions for inactivating a glutamine synthetase gene, using fusion proteins comprising a zinc finger protein and a cleavage domain or cleavage half-domain. Polynucleotides encoding said fusion proteins are also provided, as are cells comprising said polynucleotides and fusion proteins. | Sangamo BioSciences (Richmond, CA, USA) | Liu P-Q, Miller JC | 3/26/2015 |
| US20150079681 | Systems, methods and compositions for manipulation of sequences and/or activities of target sequences, including vectors and vector systems, some of which encode one or more components of a CRISPR complex, as well as methods for the design and use of such vectors. Also, methods of directing CRISPR complex formation in eukaryotic cells and methods for selecting specific cells by introducing precise mutations utilizing the CRISPR-Cas system. | The Broad Institute (Cambridge, MA, USA), Massachusetts Institute of Technology (Cambridge, MA, USA) | Zhang F | 3/19/2015 |
| US20150071906 | A delivery system for functional effector proteins, e.g., transcriptional modulators (e.g., repressors or activators), recombinases, nucleases (e.g., RNA-programmable nucleases, such as Cas9 proteins; transcription activator-like enhancer (TALE) nuclease, and zinc finger nucleases), deaminases, and other gene modifying/editing enzymes using cationic lipids and cationic polymers into cells *in vivo*, *ex vivo* or *in vitro*. Useful for therapeutic and research purposes, including, but not limited to, the targeted manipulation of a gene associated with disease, the modulation of the expression level of a gene associated with disease and the programming of cell fate. | President and Fellows of Harvard College (Cambridge, MA, USA) | Liu DR, Zuris JA, Thompson DB | 3/12/2015 |
| US20150067922 | Compositions and methods for specific gene targeting and precise editing of DNA sequences in plant genomes using the CRISPR-associated nuclease for the production of nontransgenic, genetically modified crops. | The Penn State Research Foundation (University Park, PA, USA) | Yang Y, Xie K | 3/5/2015 |
| US20150064790 | Engineered zinc finger proteins that target genes encoding 5-enolpyruvyl shikimate-3-phosphate synthase (EPSPS) in plants and methods of using such zinc finger proteins in modulating gene expression, gene inactivation and targeted gene modification. In particular, the disclosure pertains to zinc finger nucleases for targeted cleavage and alteration of EPSPS genes. | Dow AgroSciences (Indianapolis), Sangamo BioSciences (Richmond, CA, USA) | Gupta M, Palta AM, Novak S, Urnov F, Gopalan S | 3/5/2015 |
| US20150056629 | Compositions, systems and methods that employ one or more fusion protein pairs, wherein each fusion protein within a fusion protein pair comprises a sequence-specific nucleic acid binding protein, such as sequence-specific Cas9 protein (e.g., a CRISPR), a sequence-specific TALE protein, a sequence specific homing endonuclease (HE; a/k/a meganuclease), a 3′ exonuclease and/or a sequence-specific zinc finger protein, which sequence-specific nucleic acid binding protein is operably linked to one half of a split-reporter molecule, such as a split-fluorescent reporter molecule, a split-luminescent reporter molecule, a Forster resonance energy transfer reporter molecule or a Bioluminescence Resonance Energy Transfer reporter molecule. | Guthrie-Honea K | Guthrie-Honea K | 2/26/2015 |
| US20150044772 | Chimeric fusion proteins including a CRISPR-Cas system fused to a DNA-modifying enzyme and methods of using the chimeric fusion proteins in gene editing. Can be used to induce double-strand breaks and single-strand nicks in target DNAs to generate gene disruptions, deletions, point mutations, gene replacements, insertions, inversions and other modifications of a genomic DNA within cells and organisms. | Sage Labs (St. Louis) | Zhao G | 2/12/2015 |
| US20150031134 | Systems, methods and compositions for manipulation of sequences and/or activities of target sequences, including vectors and vector systems, some of which encode one or more components of a CRISPR complex, as well as methods for the design and use of such vectors, and methods of directing CRISPR complex formation in eukaryotic cells and methods for selecting specific cells by introducing precise mutations utilizing the CRISPR-Cas system. | The Broad Institute (Cambridge, MA, USA), Massachusetts Institute of Technology (Cambridge, MA, USA), The Rockefeller University (New York) | Zhang F, Cox DBT, Marraffini L, Bikard DO, Jiang W | 1/29/2015 |
| US20150024500 | A method and compositions utilizing the CRISPR system to disrupt a target gene in eukaryotic cells to produce double allele knockouts. Useful in producing afucosylated antibodies with enhanced antibody-dependent cell-mediated cytotoxicity activity. | Larix Bioscience (Sunnyvale, CA, USA) | Yu B, Larrick J | 1/22/2015 |

CRISPR-Cas, clustered, regularly interspaced, short palindromic repeats (CRISPR)–CRISPR-associated protein (Cas). Source: US Patent and Trademark Office (http://www.uspto.gov); European Patent Office (http://www.epo.org/).