

What is claimed:

1. A method of effecting a genetic alteration in the genome of a whole seed or part of a seed, comprising imbibition of the whole seed or part of a seed in an aqueous polynucleotide composition that comprises: (a) an RNA-guided nuclease or a polynucleotide that encodes the RNA-guided nuclease, and (b) at least one guide RNA or polynucleotide encoding a guide RNA;
wherein the at least one guide RNA is capable of directing the RNA-guided nuclease to a defined location in the genome, thereby effecting a genetic alteration at the defined location in the genome;
wherein the genetic alteration is at least one alteration selected from the group consisting of insertion of at least one nucleotide, deletion of at least one nucleotide, or replacement of at least one nucleotide at the defined location in the genome.
2. A whole seed or part of a seed comprising a genetic alteration in its genome, provided by the method of claim 1, or a plant grown or regenerated from the whole seed or part of a seed, wherein the plant comprises cells comprising the genetic alteration in their genome.
3. A method of effecting a genetic alteration in the genome of embryonic plant tissue, comprising bombardment of the embryonic plant tissue with polynucleotide composition comprising a particle complexed with a ribonucleoprotein (RNP) comprising an RNA-guided nuclease and at least one guide RNA (gRNA) having a nucleotide sequence designed to alter a target nucleotide sequence in the genome, thereby effecting the genetic alteration.
4. A method of delivering a guide RNA (gRNA) to a non-epidermal plant cell,
wherein the non-epidermal plant cell is in a plant or part of a plant,
wherein the gRNA has a nucleotide sequence designed to alter a target nucleotide sequence in the non-epidermal plant cell, and wherein the gRNA is provided as a polynucleotide composition comprising:
 - (i) a CRISPR RNA (crRNA) that includes the gRNA, or a polynucleotide that encodes a crRNA, or a polynucleotide that is processed into a crRNA; or
 - (ii) a single guide RNA (sgRNA) that includes the gRNA, or a polynucleotide that encodes an sgRNA, or a polynucleotide that is processed into an sgRNA;
 wherein the delivery of the polynucleotide composition comprises at least one treatment selected from the group consisting of: soaking or imbibition; direct application; vacuum infiltration; application of negative or positive pressure; introduction into the vascular system; microinjection; application of ultrasound or vibration; application of hydrodynamic pressure, friction, cavitation or shear stress; vortexing; centrifugation; mechanical cell wall or cell membrane deformation or breakage; enzymatic cell wall or cell membrane breakage or permeabilization; abrasion; electroporation; and treatment with at least one chemical, enzymatic, or physical agent;
whereby the gRNA is delivered to the non-epidermal plant cell and the target nucleotide sequence in the non-epidermal plant cell is altered.
5. The method of claim 4, wherein the plant or part of a plant is selected from the group consisting of a plant tissue, a whole plant, an intact nodal bud, a shoot apex or shoot apical meristem, a root apex or

root apical meristem, lateral meristem, intercalary meristem, a seedling, a whole seed, a halved seed or other seed fragment, an embryo, and callus.

6. The method of claim 4, wherein:
 - (a) the polynucleotide composition optionally comprises an RNA-guided nuclease, or a polynucleotide that encodes the RNA-guided nuclease; or
 - (b) the method further includes the step of providing to the non-epidermal plant cell an RNA-guided nuclease or a polynucleotide that encodes the RNA-guided nuclease; or
 - (c) the non-epidermal plant cell comprises an RNA-guided nuclease or a polynucleotide that encodes the RNA-guided nuclease.
7. The method of claim 4, wherein
 - (a) the polynucleotide composition further comprises a chemical agent or a physical agent or a combination of both chemical and physical agents, or
 - (b) the method further comprises the step of treating the plant cell with a chemical agent or a physical agent or a combination of both chemical and physical agents;

wherein the chemical agent is at least one selected from the group consisting of solvents, fluorocarbons, glycols or polyols, surfactants; primary, secondary, or tertiary amines and quaternary ammonium salts; saponins; organosilicone surfactants; lipids, lipoproteins, lipopolysaccharides; acids, bases, caustic agents; peptides, proteins, or enzymes; cell-penetrating peptides; RNase inhibitors; cationic branched or linear polymers; dendrimers; counter-ions, amines or polyamines, osmolytes, buffers, and salts; polynucleotides; transfection agents; antibiotics; non-specific DNA double-strand-break-inducing agents; antioxidants; and chelating agents; and

wherein the physical agent is at least one selected from the group consisting of particles or nanoparticles, magnetic particles or nanoparticles, abrasive or scarifying agents, needles or microneedles, matrices, and grids.
8. The method of claim 4, wherein the crRNA, the polynucleotide that encodes a crRNA, the polynucleotide that is processed into a crRNA, the sgRNA, the polynucleotide that encodes an sgRNA, or the polynucleotide that is processed into an sgRNA further comprises one or more additional nucleotide sequences selected from the group consisting of an aptamer or riboswitch sequence, a nucleotide sequence that provides secondary structure, a nucleotide sequence that provides a sequence-specific site for an enzyme, T-DNA sequence, a DNA nuclear-targeting sequence, a regulatory sequence, and a transcript-stabilizing sequence.
9. The method of claim 4, wherein the crRNA, the polynucleotide that encodes a crRNA, the polynucleotide that is processed into a crRNA, the sgRNA, the polynucleotide that encodes an sgRNA, or the polynucleotide that is processed into an sgRNA comprises: (a) double-stranded RNA, (b) single-stranded RNA; (c) chemically modified RNA; (d) a combination of (a) – (c).
10. The method of claim 6, wherein the RNA-guided nuclease or polynucleotide that encodes the RNA-guided nuclease is provided:

- (a) as a ribonucleoprotein complex comprising the crRNA and the RNA-guided nuclease;
 - (b) as a complex comprising the RNA-guided nuclease or polynucleotide that encodes the RNA-guided nuclease and at least one peptide selected from the group consisting of a cell-penetrating peptide, viral movement protein, or transfecting peptide;
 - (c) as a fusion protein comprising the RNA-guided nuclease and at least one peptide selected from the group consisting of a cell-penetrating peptide, viral movement protein, or transfecting peptide;
 - (d) on a carrier molecule or a particulate;
 - (e) in a liposome, micelle, protoplast or protoplast fragment;
 - (f) using a combination of any of (a) – (e).
11. The method of claim 6, wherein the RNA-guided nuclease is provided:
- (a) by contacting the non-epidermal plant cell with the RNA-guided nuclease or polynucleotide that encodes the RNA-guided nuclease;
 - (b) by transporting the RNA-guided nuclease or polynucleotide that encodes the RNA-guided nuclease into the non-epidermal plant cell using a chemical, enzymatic, or physical agent;
 - (c) by bacterially mediated transfection with a polynucleotide encoding the RNA-guided nuclease; or
 - (d) by transcription of a polynucleotide that encodes the RNA-guided nuclease.
12. The method of claim 4, wherein the polynucleotide composition comprises a liquid, a solution, a suspension, an emulsion, a reverse emulsion, a colloid, a dispersion, a gel, liposomes, micelles, an injectable material, an aerosol, a solid, a powder, a particulate, a nanoparticle, or a combination thereof.
13. A non-epidermal plant cell comprising an altered target nucleotide sequence, provided by the method of claim 4, or a plant grown or regenerated from the non-epidermal plant cell comprising an altered target nucleotide sequence, wherein the plant comprises cells having the altered target nucleotide sequence, or seed or plant parts of the plant.
14. The method of claim 4, wherein the non-epidermal plant cell is haploid, wherein the method further comprises the step of chromosome doubling in the non-epidermal plant cell comprising the altered target nucleotide sequence to produce a doubled haploid cell that is homozygous for the altered target nucleotide sequence.
15. The doubled haploid cell that is homozygous for the altered target nucleotide sequence, provided by the method of 14.
16. The method of claim 14, further comprising regeneration of a doubled haploid plant from the doubled haploid cell, wherein the regenerated doubled haploid plant comprises cells that are homozygous for the altered target nucleotide sequence.
17. The regenerated doubled haploid plant provided by the method of claim 16, or seed or plant parts of the regenerated doubled haploid plant, or a hybrid plant having at least one parent plant that is the regenerated doubled haploid plant.

18. The method of any of claims 1, 3, or 6, wherein the RNA-guided nuclease is selected from the group consisting of an RNA-guided DNA endonuclease, a type II Cas nuclease, a Cas9, a type V Cas nuclease, a Cpf1, a CasY, a CasX, a C2c1, a C2c3, an engineered nuclease, and a codon-optimized nuclease.
19. The method of claims 1 or 3, wherein the genetic alteration is heritable to succeeding generations.