



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Arcadia Biosciences, Inc. (Arcadia) - Vegetative Production of Oil in a C4 Crop

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Davis, CA

Proposed Action Description:

This award is a continuation and expansion of research being performed by Arcadia under DE-AR0000205 to engineer lipid-rich biomass in a commercial crop. Funding will support research to develop sorghum engineered to produce and accumulate triacylglycerides (oil) in the leaves and stalk of the plant.

Proposed work consists of: (1) development of plant transformation constructs and vectors to engineer increased oil synthesis and accumulation in sorghum; (2) transformation of sorghum plants and growth of engineered sorghum plants in contained laboratory growth chambers and greenhouse facilities; and (3) analysis of engineered sorghum plants and plant biomass. Proposed work does not involve the release of recombinant DNA or engineered organisms into the environment.

Proposed development of plant transformation constructs and analysis of engineered sorghum plants and plant biomass will take place at University of California, Davis's dedicated laboratory facilities in Davis, CA. Proposed transformation of sorghum, growth of engineered sorghum plants, and analysis of engineered sorghum plants and plant biomass will take place at Arcadia's laboratory and greenhouse facilities in Davis, CA.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

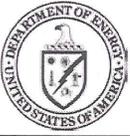
There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 09/26/2012



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0470-1532) Arcadia Biosciences, Inc. - Vegetative Production of Oil in a C4 Crop

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Davis, CA

Proposed Action Description:

Funding will support development of genetically modified (GM) *Setaria viridis* (*Setaria*) that produces triacylglycerol (vegetable oil) in the tissues of the plant in place of starch. If the work performed under the award is successful, Arcadia will incorporate the gene combinations developed in *Setaria* into sorghum.

Proposed work will consist of laboratory-based (1) genetic modification of *E. coli* to construct vectors for implementing oil production genes in *Setaria*; (2) genetic modification of *Setaria* to express gene combinations for three different pathways that are critical to oil synthesis; and (3) analyzing the resulting GM *Setaria* plants to compare the biomass production, oil production, and photosynthetic capacity of the GM *Setaria* plants to those of natural *Setaria* plants. This project will not involve field testing with GM plants.

Proposed genetic modification of *Setaria* and growth and analysis of the resulting GM *Setaria* will take place at Arcadia Biosciences, Inc.'s facilities in Davis, CA. Proposed genetic modification of *E. coli* and analysis of GM *Setaria* plants will take place at the University of California-Davis (UC Davis) campus in Davis, CA. Research teams at both organizations will carry out all activities involving recombinant DNA and GM plants in accordance with the NIH Guidelines for Research Involving Recombinant DNA Molecules. UC Davis will receive approval from its Institutional Biosafety Committee prior to beginning work with recombinant DNA molecules.

Categorical Exclusion(s) Applied:

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer:

Date Determined: 11/21/2011