U.S. Department of Energy
Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0470-1541) Chromatin Inc. - Plant Based Sesquiterpene Biofuels

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Kansas, Kentucky, Illinois, Ohio

Proposed Action Description:

Funding will support development of genetically modified (GM) sweet sorghum (Sorghum bicolor) to produce increased levels of farnesene, a drop-in biofuel. Proposed work will consist of (1) transforming sweet sorghum with mini-chromosomes carrying limiting genes and metabolic pathway genes to increase farnesene synthesis; (2) evaluating and optimizing genes from plants, E. coli, and yeast (Saccharomyces cerevisiae) to improve enzymatic activity and specificity; (3) testing plasmid constructs and evaluating optimized genes in a model plant, guayule (Parthenium argentatum); (4) conducting gene expression profiling of sweet sorghum stem, leaf, and root tissues; (5) conducting terpenoid profiling of both wild-type and GM sweet sorghum and guayule to determine modifications necessary to increase farnesene production in GM sorghum; (6) developing gene stacks and mini-chromosomes to increase farnesene production in GM sweet sorghum; (7) inserting carbon capture enhancement (CCE) genes in GM sweet sorghum to increase carbon flux; and (8) crossing GM sweet sorghum lines engineered with farnesene metabolic pathway genes to CCE transgenic sweet sorghum lines to develop a fully functional farnesene biosynthetic pathway capable of producing farnesene-enriched sesquiterpenes. This project will not involve field testing with GM plants.

Proposed work involving GM sweet sorghum will take place at dedicated indoor laboratory and greenhouse facilities at Chromatin Inc. (Chicago and Champaign, IL), Ohio State University (Wooster, OH), University of Nebraska - Lincoln (Lincoln, NE), Kansas State University (Manhattan, KS), and Allylix Inc. (Lexington, KY). All organizations handling recombinant DNA will receive approval from their Institutional Biosafety Committees prior to beginning work with recombinant DNA molecules and will conduct research in accordance with the NIH Guidelines for Research Involving 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: 12/05/2011