

DRAFT

COLORADO HEMP RESEARCH FOR NOVEL TRANSLATIONAL APPLICATIONS (CoHeReNT) CENTER

Program Plan

I. Statement of General Purpose of the Unit

Purpose

The purpose of the Colorado Hemp Research for Novel Translational Applications (CoHeReNT) Center is to perform collaborative research, provide educational opportunities to graduate students at Colorado State University (“CSU”) and the University of Colorado (“CU”), seek out commercialization opportunities for industrial applications, and contribute to the economic well-being of the state of Colorado, the region and the nation as related directly to industrial hemp (i.e. cannabis with THC levels not more than 0.3% by dry weight).

Activities

The activities of the CoHeReNT Center include the following:

- (1) To establish a collaborative research environment with CSU and CU as the lead institutions, in conjunction with industry, foundations and other not-for-profit organizations and the government – including, but not limited to the following, focused areas of research:
 - a. Agricultural Sciences
 - b. Engineering and Advanced Materials
 - c. Human & Animal Health
 - d. Food Science & Nutrition
 - e. Agronomics & Economics
 - f. Design & Merchandising, and
 - g. Functional Genomics
- (2) To provide a collaborative and participatory interface between the Sponsoring Members, CSU and CU for the performance of pre-competitive research (“Shared Research”);
- (3) To provide a streamlined, tailored interface between the Sponsoring Members, CSU and CU that facilitates the development and implementation of directed sponsored research projects (“Sponsored Research”);
- (4) To provide related research opportunities, seed grants for hemp research, and training and educational experiences for graduate students at CSU and CU; and,
- (5) To publish and otherwise disseminate the results of the Shared and Sponsored Research projects developed through the CoHeReNT Center in a manner that enhances the competitive capabilities of the Sponsoring Members. Publication of

DRAFT

the results from Sponsored Research projects will be accomplished in a way that protects proprietary information and potentially patentable intellectual property.

II. Congruence with Role and Mission of the University

The CoHeReNT Center exists to perform collaborative research in accordance with the following objectives:

- (1) CoHeReNT seeks to develop new industrial applications of industrial hemp and seek out commercialization opportunities for industrial applications of hemp.
- (2) CoHeReNT strives to provide relevant training and educational opportunities for students (BS, MS, and PhD) at CSU and CU.
- (3) CoHeReNT works to create an integrated research and training environment, where academia and industry collaborate in the development of industrial hemp for future commercialization and to contribute to the economic well-being of the State of Colorado, the region and the nation as related directly to hemp.

The CoHeReNT Center seeks to become the United States' leading center for research, education, and innovation across a range of scientific and agricultural disciplines relevant to and directly related to industrial hemp research as well as industrial hemp's wide-range of commercial usages including but not limited to: clothing, paper, biodegradable plastics, fibers, biofuel, oils and textiles. This vision also extends to human and animal health implications with a focus on nutrition and food sciences.

Hemp is a promising crop to the agricultural and commercial industries because it is considered to be environmentally friendly; however, there is a need for improving industrial hemp production. In 2013, Congress amended Farm Bill, Section 7606, the Legitimacy of Industrial Hemp Research, which authorizes institutions of higher education or State departments of agriculture in states where hemp is legal to grow hemp for research or agricultural pilot programs. Hemp has not been grown legally in the U.S. since 1957, therefore there is a need for research and development of hemp varieties. The Center is designed to research new technologies to utilize hemp as an energy crop, make a contribution to existing fuels and commercial products such as paper, fiber and clothing, and do so in an environmentally safe manner. The Center will allow for the investigation of multiple novel technologies such as utilizing the functional genomics of hemp to study and research effective cultivation methods and product enhancement. Hemp research has been and will continue to receive investment from large companies and the venture community.

Industrial hemp consistently contains around 1% of cannabidiol (CBD) a non-psychoactive plant constituent shown to have promising medicinal effects. The interest in CBD pharmacology and its medicinal properties have increased significantly and has been the subject of thousands of publications in the last decade. The US Food and Drug Administration has recently approved a CBD-enriched oral liquid derived from plant material for the treatment of Dravet syndrome, in which patients have intractable epilepsy. CBD has been frequently shown to have anticonvulsant, antipsychotic, anti-inflammatory, antidepressant, anxiolytic and neuroprotective properties. CoHeReNT

DRAFT

Center intends to be integrally involved in advancing medicinal hemp research, while expanding the investigation of its therapeutic potential, efficacy and safety. Emphasis on medicinal hemp research will provide increasing opportunities for partnering with pharmaceutical and nutraceutical companies locally and nationally, as laws governing hemp and cannabis are evolving and creating more flexibility for research and development.

The CoHeReNT Center has been designed to integrate comprehensive research disciplines and educational programs, which will engage undergraduate, graduate, post-doctoral and industrial scientists. CU and CSU hold intellectual enrichment and innovation to be of the utmost importance. CU and CSU programs have been developed to expand the overall accessibility of industrial hemp education. By fostering the interaction among academic, industry and national researchers CoHeReNT Center is able to educate students in preparation for the future research and multi-disciplinary needs of the emerging and prospective commercial and pharmaceutical industries.

The CoHeReNT Center is an interdisciplinary organization at CSU and is simultaneously a collaborative partnership among faculty and researchers at CU. Research results will be integrated into the curricula of the participating departments. The CoHeReNT Center will distinguish both Universities as leaders in agriculture, commercialization, genomics, nutritional and health research of industrial hemp.

III. Institutional Capability for Implementing the Unit

The CoHeReNT Center will be funded by sponsoring membership fees from industrial sponsors, matching funds from the University of Colorado and CSU, and any private or public entity upon payment of an annual fee made payable to CSU. The CoHeReNT Center is a formal collaboration among two Participating Institutions and the Sponsoring Members. CoHeReNT Center activities, including Shared Research, Sponsored Research, and training, will be carried out at both institutions. To facilitate the administrative and financial management of the Center, CSU will serve as the administrative lead site.

The CoHeReNT Center provides a wealth of experience and dedication to industrial hemp research in wide-ranging disciplines such as agricultural sciences, functional hemp genomics, nutrition, engineering advanced materials, human and animal health, and food sciences.

IV. Administrative Structure of the Unit

The CoHeReNT Center's administrative structure consists of a Steering Committee comprising of six co-directors (two at CSU; one each at CU Boulder, CU Denver, and the Colorado Department of Agriculture ("CDA") and a Center Advisory Board ("AB"). The co-directors are as follows: Dr. Jessica Prenni and Dr. John McKay (CSU), Dr. Kent Hutchison (CU Boulder), Dr. Jeffery Galinkin (CU Denver), and Dr. Ron Carleton (CDA).