NIH Centers for Dietary Supplements Research: Botanicals

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Herbs and Botanical Medicines

- 1.5 Billion Dollar Per Year Industry
- Covered by DSHEA Legislation of 1994
- Quality, Safety, and Efficacy Issues
- Licensing and Regulation
- Structure, Function and General Well-Being
- Research Agenda
Established in cooperation with the National Center for Complementary/Alternative Medicine at NIH to fund research on Dietary Supplements.

- Strategic Plan calls for four centers
- Training Grant, Medical School Curriculum
- UCLA and UIC are the first two centers.
Goals of the UCLA CDSRB

- Establish that multiple ingredients act differently than a single purified substance.
- Identify active constituents in botanicals and explore their mechanisms of action in well-defined biological systems;
- Conduct pre-clinical studies (cell culture and animals)
- Conduct phase I/II clinical evaluations of botanicals.
- Assess the bioavailability/bioactivity of botanical ingredients including phytochemical marker compounds and active ingredients.
Specific Projects in the Center

- Chinese Red Yeast Rice
- Green Tea Extracts
- St. John’s Wort
- Soy Isoflavones and Cancer Prevention
- Echinacea and Immune Function
- Flavonoid Bioavailability and Markers
- Phytoestrogen Screening by Bioassay
Chinese Red Yeast Rice

- Shown to Lower Cholesterol in Humans
- Are the other Monacolins Active?
- What are the effects of the botanical preparation on plaque stabilization?
- Develop preliminary human pharmacokinetic data for large multicenter trial of cardiovascular health.
Green Tea Extract

- Catechins are very potent antioxidants in vitro and protect DNA from damage.
- Are the multiple catechins more active than EGCG in blocking oxidation and angiogenesis?
- What is the bioavailability?
- What are the effects on oxidation in man?
St. John’s Wort

- Found to be effective mood enhancer for mild dysthymia but mechanism not established.
- Does St. John’s wort act as a serotonin reuptake inhibitor, a monoamine oxidase inhibitor or both?
- Is hypericin or hyperforin the active ingredient or do both contribute?
Soy Isoflavones and Cancer

- What are the effects of soy isoflavones on prostate tumor growth by comparison to purified genistein?
What are the effective components in Echinacea and how do these affect immune function with regard to some specific markers of immune function relevant to the common cold?
Flavonoid Bioavailability

- Flavonoids including quercetin and kaempferol are among the antioxidants taken in the greatest quantity in the diet and are derived from plants.
- What levels of flavonoids are indicative of getting a protective effect from fruits and vegetables in terms of antioxidation?
The Search for Phytoestrogens

- Plants have developed chemicals with estrogenic potential that bind to two different classes of estrogen receptors.
- Can we develop a biological screening method for these?
- This would help to develop female hormone replacement therapies.
Core Laboratories

- Analytical Phytochemistry Core at UCLA with collaboration at University of Kansas
- Agriculture/Botany Core: Cal State Poly Pomona School of Agriculture and the Plant Molecular Biology Group at the UCLA College of Letters and Sciences
- Biostatistics/Clinical Pharmacology Core to examine herb-drug interaction/metabolism
A New Paradigm for Botanicals

- Define the plant source genetically
- Grow under specified conditions
- Establish range for phytochemical contents
- Test in appropriate biological models
- Clinical testing in phase I, II trials
- Examine herb-drug interactions
- Build the science base for supplements
Conclusion

- Much more research is needed to fulfill the promise of botanical dietary supplements for public health through prevention.
- The NIH Centers for Dietary Supplement Research is a beginning in this process.
- Continued partnering of government, academia, industry and the public will advance the day when full benefits realized.