

FBS and 1% penicillin and then treated with increasing concentrations (0, 1, 10, 100, 500, 1000, 2500 and 5000 μ M) of END or ENL for 24 hrs. Subsequently, cells were challenged with LPS (500 ng/mL) for 24 hrs to induce an inflammatory response. Nitric oxide (NO) and cell viability were assessed using the Griess and Resazurin assays, respectively. Cell viability was not affected by any concentrations of END and ENL used in the study. As expected, the addition of LPS induced a significant increase in the production of NO and both END and ENL significantly decreased NO production. However, lower concentrations of ENL compared to END were required to significantly reduce NO production. These findings may in part explain the anti-atherosclerotic effect of flaxseed and suggest that ENL may have more potent anti-inflammatory properties.

701.26

Anti-obesity effect of the flavonoids isolated from *Allium cepa* L. var. *agrogatum* Don.

Xiaohong Yang, Xiaoping Zhou, Dayuan Sui, Muxin Zhang, Guangshu Wang. Pharmacy College, Jilin University, 1266 Fu Jin Road, Changchun, China, People's Republic of

Allium cepa L. var. *agrogatum* Don. is one kind of Liliaceae plant and its extracts have been shown to have anti-inflammatory effect. In this study we investigated effect of the flavonoid constituents from *Allium cepa* L. var. *agrogatum* Don. on body fat and blood lipid profile of high fat diet-induced obese Wistar rats. The animals were divided to 4 groups (12/group) and fed control diet, high fat diet, high fat diet extract A, or high fat diet plus extract B for 15 d. Body weight, body fat, whole blood viscosity of low shear, medium shear and high shear, plasma viscosity, contents of triglycerides (TG), total cholesterol (TC), low density lipoprotein, and high density lipoprotein were determined. Results showed that the flavonoid constituents (both extract A and B) significantly visceral fat and extract B also significantly reduced decreased medium shear viscosity and low shear viscosity. No significant effect on blood lipid was observed. We conclude that the flavonoid constituents from *Allium cepa* L. var. *agrogatum* Don. may have an anti-obesity potential.

701.27

Comparison of Plasma Isoflavone Extraction

Neal E. Craft, Thomas Mitchell. Craft Technologies, Inc., 4344 Frank Price Church Rd., Wilson, NC, 27893

Isoflavones are prominent in soy products and may reduce the risk of certain breast cancers. To assess the benefits of isoflavones, an accurate method of analysis is needed. **Objective:** Evaluate and, if necessary, develop an extraction to provide accurate and reproducible measurement of endogenous plasma isoflavones. **Methods:** Three published methods, along with variations, and three extraction solvents (ether, ethyl acetate, butyl methyl ether [MTBE]) were tested. An in-house method involving an enzymatic hydrolysis, protein precipitation, lipid extraction, and isoflavone extraction was included. The HPLC separation uses a Luna C18 column with a multi-step gradient. Peak areas were monitored in the UV at 255 nm and electrochemically at 760 mV. **Results:** MTBE was a slightly better solvent than ethyl acetate or ether. Using direct solid-phase extraction was simple and worked for spiked samples but poorly extracted endogenous isoflavones. Without protein precipitation endogenous recovery was lower. The in-house method yielded cleaner samples and good recovery of spiked and endogenous isoflavones. Interday reproducibilities were 6-9% in spiked QC samples. Incorporation of an internal standard, 4-OH benzophenone, improved method reproducibility. The higher electrochemical voltage was necessary to oxidize the internal standard. This method was used to test plasma isoflavones in a human kinetic study.

701.28

Fractions from Echinacea Species Inhibit Prostaglandin E2

Carlie A. LaLone, Avery Kent Sia Solco, Meehye Kim, Patricia A. Murphy, Diane F. Birt. Food Science and Human Nutrition, Iowa State University, 220 MacKay Hall, Ames, IA, 50011

The purpose of this research was to assess anti-inflammatory activity of *Echinacea* fractions and improve understanding of how constituents interact. Fractions were prepared from Soxhlet EtOH extracts of *E. purpurea*, *E. angustifolia*, *E. pallida*, and *E. tenesseeensis* using semi-preparative reverse phased HPLC and analyzed at 260nm and 330nm to examine lipophilic alkamides and phenolic constituents, respectively.

Fractions were screened using lipopolysaccharide induced RAW264.7 mouse macrophage cells and analyzed for prostaglandin E₂ (PGE₂) production. Cytotoxicity was also studied using an MTS assay. A caffeic acid derivative rich fraction 1 (263 μ g/ml), from *E. angustifolia*, significantly inhibited PGE₂ production ($p < 0.05$), along with fraction 3 (5 μ g/ml), containing a large HPLC peak for alkamides 8 and 9 ($p < 0.001$). *E. pallida*, which consists mainly of ketones with no trace of alkamides, showed significant inhibition of PGE₂ ($p < 0.001$) with fraction 3 (5 μ g/ml), containing large peaks for ketones 20 and 21. Fraction 3 (20 μ g/ml), from *E. tenesseeensis*, significantly inhibited PGE₂ levels ($p < 0.05$) and displayed large HPLC peaks for alkamides 12, 14, 16, and 17. Fractions from *E. angustifolia*, *E. pallida*, and *E. tenesseeensis* that showed PGE₂ inhibition capabilities were not cytotoxic. *E. purpurea* fractions were unable to significantly inhibit PGE₂ levels. Funded by P01 ES012020 from ODS/NIEHS, NIH.

701.29

Similarity of bioactivity between purified and semipurified glucoraphanin

Ren-Hau Lai¹, Elizabeth H., Jeffery^{1,2}. ¹Division of Nutritional Sciences, ²Department of Food Science and Human Nutrition, University of Illinois at Urbana, 258 Bevier Hall, 905 S Goodwin Ave, Urbana, IL, 61801

The anti-carcinogenic effects of cruciferous vegetables have been attributed to the hydrolysis products of glucosinolates; the primary glucosinolate in broccoli is glucoraphanin (GP). In this study, the goal was to determine if purified GP, in the absence of the plant-derived hydrolyzing enzyme myrosinase, could affect pulmonary or hepatic ethoxyresorufin O-deethylase (EROD) and/or quinone reductase (QR) activity. Gavage of male F344 rats with semi-purified or purified GP (240 mg/kg rat daily for 4 days) caused similar changes in QR and no change in EROD. In a second study, varying doses of semi-purified GP (0, 30, 60, or 120 mg/kg rat daily for 4 days) caused no change in EROD activity, but a dose-dependent increase in QR. In addition, the GI tract, liver, lung, kidney and bladder all exhibited normal histopathology, except cecum. The cecum from rats receiving 120 mg/kg daily for 4 days showed some inflammation and those receiving 240 mg/kg showed extensive inflammation. Urine analysis by HPLC/UV was greater on day 4 than day 1 of administration, and the lower the dose, the greater the recovery. We conclude that GP 30 and 60 mg/kg, daily for 4 days, are safe and effectively enhance QR in all tissues evaluated. This research was funded by Kraft Foods Ltd

701.30

Isolation and anti-inflammatory activity of the sesquiterpene lactone dihydrolactucopirin

Barbara M Schmidt¹, Moul Dey¹, Alexander Poulev¹, Nebojsa Ilic², Ilya Raskin¹. ¹Biotech Center, Rutgers University, 59 Dudley Rd., New Brunswick, NJ, 08901, ²Phytomedics, Inc, 1085 Cranbury South River Road, Jamesburg, NJ, 08831

Many sesquiterpene lactones have demonstrated anti-inflammatory properties. Dihydrolactucopirin (DP), a sesquiterpene lactone from *Chicorium* species, has a unique guaianolide ester structure, but has never before been reported for anti-inflammatory activity. Therefore, DP was isolated from *Chicorium intybus* using liquid-liquid partitioning, preparative HPLC, and LC-MS. Anti-inflammatory activity was determined by measuring nitric oxide production and pro-inflammatory gene expression in RAW macrophages. DP inhibited nitric oxide production in a dose-dependant manner (IC₅₀ = 13 μ M) and had higher activity than aspirin and other sesquiterpene lactones isolated from *Chicorium intybus*. DP also inhibited expression of the pro-inflammatory genes TNF- α , IL1 β , and iNOS, which may partially account for the reduction in nitric oxide production. Overall, DP shows promise as a potent botanical anti-inflammatory agent.

701.31

Ironman Triathlon Recovery Enhanced By Dietary Supplementation

Shawn M Talbott¹, Julie A Talbott², David Wood³. ¹SupplementWatch, Inc., 648 East Rocky Knoll, Draper, UT, 84020, ²Wicked Fast Sports Nutrition, 648 East Rocky Knoll, Draper, UT, 84020, ³Redman Triathlon, 2717 NW 50th, Oklahoma City, OK, 73112

BACKGROUND: Protein/carbohydrate beverages have been used to promote immediate post-exercise recovery, but longer-term recovery