standing, light-intensity walking and moderate-intensity walking conditions (6.72 ± 1.86, 5.13 ± 1.25, and 3.49 ± 0.47 mmol·hr/L, respectively). Glucose iAUC and insulin iAUC were negatively associated with estimated EE (unstandardised coefficient; glucose = -7.84 mmol·hr/L/MJ, $p = 0.02$; insulin = -1.24 pmol·hr/L/kJ, $p = 0.03$).
Conclusions: Among overweight/obese individuals, frequent brief interruptions to sitting of different intensities may lower postprandial glucose and insulin concentrations in a dose-dependent manner, via increased energy expenditure.
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P109
UTILISATION OF A NEW COMPREHENSIVE DATABASE TO INVESTIGATE ANTI-INFLAMMATORY EFFECTS OF OLIVE PHENOLICS

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Background/Aims: Extracts from *Olea Europaea* possess potent anti-inflammatory effects however, the molecular mechanisms remain controversial. Our aims were to: 1) develop a database, with chemical and biological details for ~700 compounds detected in *Olea,* 2) utilise this new resource for *in silico* modelling to identify potential bioactive compounds, and 3) perform *in vitro* validation experiments to further clarify molecular mechanisms of action.
Methods: Having developed the *Olea* database, we investigated potential interactions of olive phenolics with the key inflammation-modulating cyclooxygenase enzymes, COX-1 and COX-2 using *in silico* docking and dynamic simulations. Further, findings for selected compounds were validated for COX inhibitory activity using *in vitro* biochemical assays and for enzymatic activity in cell culture systems.
Results: On the basis of an *in silico* docking screen, using a series of controls, including the non-steroidal anti-inflammatory compounds aspirin and ibuprofen, to create standard curves, we have ranked over 200 olive phenolics for binding affinity to COX-1 and -2 enzymes. Dynamic simulations (20-100 ns) indicated that top ranking bioactive compounds including oleocanthal (42.4 and 30.4 kcal/mol for COX-1 and -2, respectively) and novel 1-oleytyrosol (-50.9 and -49.7 kcal/mol) and ligostride derivative 2 (-48.2 and -43.7 kcal/mol) bind in the active site of COX-1 and -2 in a manner analogous to that for aspirin and ibuprofen.
Conclusions: We have identified novel *Olea*-derived phenolic compounds with potential anti-inflammatory activity and more generally, our overall findings provide new molecular insights highlighting the complexities associated with the anti-inflammatory effects of olive phenolics.
Funding source(s): McCord Research, Coralville, Iowa, USA

P110
BINDING OF EXOGENOUS POLYPHENOLS TO INTACT POTATO CELLS AND INDIVIDUAL CELL COMPONENTS

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Background/Aims: The bioavailability of polyphenols largely depends on their interaction with food components including entrapment in food matrices. In the present work, we investigated the mechanism and extent of binding of three major dietary phenolic compounds (catechin, ferulic acid and rutin) to model food systems, viz. intact isolated cells, cell walls (dietary fibre) and starch granules from potato tubers, to gain understanding of the interactions taking place when polyphenols are consumed within plant-based foods.
Methods: Potato cells were isolated using mild acid (0.05M HCl) and alkali (0.025M NaOH) solutions. Potato cell walls (dietary fibre) and starch granules were isolated by mechanical disruption of cells followed by selective sieving. The binding capacity of polyphenols was assessed spectrophotometric-ally by solution depletion after incubation in the presence of each substrate at different concentrations and time intervals. Confocal laser scanning microscopy was further used to confirm the presence and location of binding.
Results: Significant, concentration and time-dependent amounts of polyphenols bound to both potato cells and individual cell components (cell walls and starch granules) in comparable amounts, with catechin exhibiting the greatest binding affinity (˃20 μmol/g). Interestingly, the polyphenols were capable of penetrating the cell wall barrier and binding to the starch granules inside intact potato cells, showing the potential of intact plant cells to encapsulate bioactive polyphenols.
Conclusions: The current Results define the role of plant cell components as carriers for polyphenols, which could have potential health implications as well as industrial applications.
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P111
THE EFFECT OF A LOW-FAT, PLANT-BASED LIFESTYLE INTERVENTION (CHIP) ON SERUM HDL SUBFRACTION LEVELS – A COHORT STUDY

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Background/Aims: Low levels of HDL are considered an important risk factor for CVD. Lifestyle interventions promoting a low-fat, plant-based eating pattern appear to reduce cardiovascular risk while paradoxically also reducing HDL levels. Recent studies have shown HDL to comprise a range of subfractions, but the role these play in ameliorating the risk of CVD is unclear. The purpose of this study was to characterize potential differences in changes in HDL subfractions in individuals participating in the Complete Health Improvement Program (CHIP) lifestyle intervention.
Methods: Individuals participating in a CHIP intervention were assessed at baseline and 30 days for changes in BMI, BP, lipid profile, including large-, intermediate- and small-HDL subfractions, and fasting plasma glucose. Only individuals ($n = 22$; mean ± SD age: 55.4 ± 16.3 years; 45.5% men) where HDL decreased were included in the analyses. The extent of change in each measure was assessed using paired t-tests.
Results: In 30 days, all biometrics, including HDL subfractions significantly decreased, except for triglycerides which did not change. The decrease in small HDL was at least two-times greater than large or intermediate-HDL (22.7%, 10.0%, 8.3%, respectively). Intermediate-HDL was the most abundant subfraction at baseline and 30-days.
Conclusions: Levels of all HDL subfractions decreased in response to the adoption of a whole-foods, plant-based diet, along with other indicators of cardiovascular risk. Additional research is required to elucidate the reasons through which lifestyle therapies remodel the HDL particle and how this impacts the functional properties of HDL and vascular disease risk.
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P112
AUSTRALIANS CAN ADHERE TO A MEDITERRANEAN DIET RESULTING IN REDUCED CVD RISK AND MAINTAINED COGNITION; THE MEDLEY TRIAL

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