Effects of caffeine, budesonide, and their combination in reducing GM-CSF expression in human airway epithelial (A549) cells

Stevie Struiksma, Erica Leung & William Cheng
Honours Biology & Pharmacology Programme, McMaster University, Hamilton

1. Granulocyte macrophage colony stimulating factor (GM-CSF), a cytokine expressed by airway epithelial cells, prolongs eosinophil survival and activates neutrophils, eosinophils and macrophages in the inflammatory process.
2. Inhibition of GM-CSF secretion by budesonide is of major therapeutic benefit in reducing allergic asthma symptoms.
3. Budesonide and caffeine have been used in the past to reduce asthmatic symptoms, and we proposed to identify if their combination would be able to reduce GM-CSF expression and thus possibly relieve asthmatic symptoms in an additive fashion.
4. We first investigated the induction of GM-CSF secretion in A549 cells in response to the allergens house dust mite (5 µg/µL), cat dander extract (10 µg/µL), and lipopolysaccharide (0.001 µg/µL) at time points 12, 24, 36, and 48 hours.
5. ELISA studies yielded insignificant differences in GM-CSF production when stimulated cells were compared to controls. This was thought to be due to high data variability, low sample number, and/or inappropriate concentration and time points of measurement.