

### Examining Individual Factors Influencing Adherence and Response to Wholegrains and Nuts in a Series of Interventional N-of-1 Studies

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**Objectives:** Inter-individual variations in response to dietary interventions are common, which can be affected by physiological and behavioural factors. N-of-1 studies, where a series of measurements are collected on an individual level over time, can provide insights into the factors which affect response for a single volunteer. The MI-DIET study is a series of N-of-1 studies to investigate what factors, at an individual level, influence a) adherence to a wholegrain and nuts intervention and b) blood pressure response.

**Methods:** 14 volunteers with mildly elevated blood pressure (120/80–140/90mmHg), and who were low consumers of wholegrain foods, were recruited. Each volunteer carried out a 24-week N-of-1 study, composed of three 8-week periods (observation, intervention and follow-up). Throughout the study, volunteers responded to semi-personalised morning and evening questionnaires using a wrist-worn device (PRO-Diary, CamNtech Ltd.), which also monitored activity

levels via actigraphy, and took their blood pressure daily using a wireless monitor (QardioArm, Qardio Inc.). During the intervention period, participants were provided with and asked to consume 3–4 portions of wholegrains and a handful of nuts each day, in line with the Dietary Approaches to Stop Hypertension (DASH) diet.

**Results:** To date, 11 volunteers have completed the study, and 2 volunteers have withdrawn. Each volunteer's data is analyzed on an individual level using N-of-1 dynamic modelling analysis. Results to date include a significant association between menstrual cycle day and blood pressure in one volunteer ( $p < 0.01$ ), while consumption of chocolate or cakes was associated with fewer portions of wholegrains being consumed by another volunteer ( $p < 0.05$ ).

**Conclusions:** Collecting repeated measurements on an individual level can identify relevant predictors of compliance and response to a dietary intervention for a given person. Subsequent aggregated analysis of variables measured across multiple volunteers will enable us to further understand factors which may underpin differential response to dietary interventions.

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