15. Effects of FTO on Obesity-related Anthropometrics are modulated by Age, Physical Activity and Artificially Sweetened Beverages: results from The HUNT Study (Ingrid Lovold Mostad)

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Objective: To test for interactions of non-genetic factors with effects of FTO
Methods: The two outermost quartiles of waist-hip-ratio in the HUNT3 all adult population survey was genotyped for FTO (rs9939609). We analysed data emerging from this extreme phenotype sampling by complete response analysis, by estimating effects of environmental exposures as well as genetic effects, separately for men and women in age groups 20-40, 40-60 and 60-80 years. We tested for interaction effects between FTO and non-genetic factors by stratification on the non-genetic factors in the 40-60 year age group. A P-value < 6.5×10^{-4} was considered significant after Bonferroni correction.
Results: In the 40-60 year age group (7944 women, 6694 men) anthropometric measurements confirmed that the FTO minor frequency allele (A-allele, MAF 0.42) was associated with increases in waist-hip-ratio, BMI, body weight, waist and hip circumference, but not height. Effect sizes were similar but not significant in the 60-80 year age (3948 women, 4084 men) whereas they were lower in the 20-40 year age group (4816 women, 3273 men). Reported high physical activity reduced the FTO effect in women and reversed the effect in men, as evident from non-overlapping confidence intervals. Intake of artificially sweetened beverages significantly modulated effects of FTO on waist circumference in women, the effect size of the risk allele being larger for regular drinkers vs never drinkers. Smoking (in a comparison ever vs. never) tended to increase the impact of the risk allele in men but not in women.

Conclusions: In this Norwegian population the effect of the FTO obesity risk allele is modulated by age, physical activity and drinking artificially sweetened beverages, with a tendency also for interaction with smoking. The findings highlight the importance of interaction between environmental and genetic risk factors for obesity.
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16. Plasma fatty acids as predictors of glycemia and type 2 diabetes – METSIM Study (Maria Lankinen)

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Objective: Our aim was to investigate the fasting proportions of fatty acids (FAs) and estimated desaturase and elongase activities in three different lipid fractions in plasma, phospholipids (PL), cholesteryl esters (CE) and triglycerides (TG), as predictors for the worsening of glycemia (area under the glucose curve in an oral glucose tolerance test, Glucose AUC) and incident type 2 diabetes (T2DM) in a 5.9-y follow-up of the population-based METSIM cohort.