REV-ERB-ALPHA circadian gene variant associates with obesity in two independent populations: Mediterranean and North American.

SCOPE: Despite the solid connection between REV-ERB and obesity, the information about whether genetic variations at this locus may be associated with obesity traits is scarce. Therefore our objective was to study the association between REV-ERB-ALPHA1 rs2314339 and obesity in two independent populations.

METHODS AND RESULTS: Participants were 2214 subjects from Spanish Mediterranean (n = 1404) and North American (n = 810) populations. Anthropometric, biochemical, dietary, and genotype analyses were performed. We found novel associations between the REV-ERB-ALPHA1 rs2314339 genotype and obesity in two independent populations: in Spanish Mediterranean and North American groups, the frequency of the minor-allele-carriers (AA+AG) was significantly lower in the "abdominally obese" group than in those of the "nonabdominally obese" group (p < 0.05). Minor allele carriers had lower probability of abdominal obesity than noncarriers, and the effect was of similar magnitude for both populations (OR ≈ 1.50). There were consistent associations between REV-ERB-ALPHA1 genotype and obesity-related traits (p < 0.05). Energy intake was not significantly associated with REV-ERB-ALPHA1 rs2314339. However, physical activity significantly differed by genotype. A significant interaction between the REV-ERB-ALPHA1 variant and monounsaturated-fatty-acids (MUFA) intake for obesity was also detected in the Mediterranean population.

CONCLUSION: This new discovery highlights the importance of REV-ERB-ALPHA1 in obesity and
provides evidence for the connection between our biological clock and obesity-related traits.