

# GENETIC VARIATION AND COGNITIVE FUNCTION IN OLDER ADULTS

Rowan AlEjjelat, B.S.<sup>1</sup>, Shannon Eddy<sup>1</sup>, Lyndsay A. Harshman, B.S.<sup>2</sup>

Natalie L. Denburg, Ph.D.<sup>2</sup>, Daryl J. Murry, Pharm.D.<sup>1</sup>

(1)College of Pharmacy, University of Iowa, (2) Carver College of Medicine, University of Iowa.

## Background:

Older adulthood is a period of critical decision-making. It is also marked by variations in cognitive abilities which are frequently described as difficulties in concentration and loss of problem-solving skills resulting in poor decision-making. General cognitive ability is known to be highly heritable. We evaluated the relation between variations in genes, previously reported to be related to cognition, and neuropsychological performance on standardized tests.

## Methods:

Older adults (OA) were eligible to participate. Enrolled members completed a several hour battery of neuropsychological instruments in addition to a health interview to rule out outstanding medical and psychiatric conditions. Genomic DNA was extracted from blood. Multidrug resistance (MDR1) C3435T, G2677T/A & C1236T; myeloperoxidase (MPO) G129A & G463A; apolipoprotein E (APOE) C112R & C158R; and 7 SNPs of the type-3 metabotropic glutamate receptor (GRM3) rs1989796, rs1476455, rs274622, rs724226, rs1468412, rs917071 & hcv11245618 were genotyped using Pyrosequencing. Statistical analysis was performed using JMP®8.0.2.

## Results:

39 OA participated; age ranged from 58 to 88 years (mean 75.6±8.5). All SNPs remained in Hardy-Weinberg Equilibrium. OA with the GRM3 hcv11245618 TT or rs1468412 AA genotype performed worse on measures of executive functioning (Wilcoxon; P-value 0.003, 0.0048 respectively). OA with MPO463 AG/AA genotype performed worse on the IGT (Chi Square; P-value 0.0037). In addition there were significant differences among the genotypes of MPO463 on several measures of verbal ability such as on a test of verbal intelligence (Chi Square; P-value 0.014).

## Conclusion:

Our results suggest that single genes can be linked to individual differences in particular components of cognition in OA. Having the GRM3 hcv11245618 TT or rs1468412 AA genotype may predispose OA to poorer performance. Additional factors (environmental) may influence the cognitive functions.