

ORIGINAL RESEARCH COMMUNICATION

# Relations of glutamate carboxypeptidase II (*GCPII*) polymorphisms to folate and homocysteine concentrations and to scores of cognition, anxiety, and depression in a homogeneous Norwegian population: the Hordaland Homocysteine Study<sup>1, 2, 3, 4</sup>

Charles H Halsted, Donna H Wong, Janet M Peerson, Craig H Warden, Helga Refsum, A David Smith, Ottar K Nygård, Per M Ueland, Stein E Vollset and Grethe S Tell

<sup>1</sup> From the University of California Davis, Davis, CA (CHH, DHW, JMP, and CHW); the University of Oxford, Oxford, United Kingdom (HR and ADS); and the University of Bergen, Bergen, Norway (OKN, PMU, SEV, and GST)

**Background:** Glutamate carboxypeptidase II (*GCPII*) encodes for intestinal folate hydrolase and brain *N*-acetylated  $\alpha$ -linked acidic dipeptidase. Previous studies provided conflicting results on the effect of the *GCPII* 1561C→T polymorphism on folate and total homocysteine (tHcy) concentrations.

**Objective:** We aimed to determine the potential effects of 2 polymorphisms of *GCPII* on plasma folate and tHcy concentrations, cognition, anxiety, and depression in a large aging cohort of Norwegians enrolled in the Hordaland Homocysteine Study.

**Design:** DNA samples were genotyped for the *GCPII* 1561C→T and 484A→G polymorphisms, and the results were linked to plasma folate and tHcy concentrations and to scores for cognition, anxiety, and depression.

**Results:** The 2 polymorphisms were in linkage disequilibrium and were associated with concentrations of tHcy. After adjustment for covariates, persons in the *CT* or combined *CT* and *TT* groups of the 1561C→T polymorphism had higher plasma folate concentrations and lower tHcy concentrations than did those in the *CC* group. Subjects with the *TT* genotype had lower Symbol Digit Modalities Test (SDMT) scores than did subjects with the *CC* genotype. Compared with abstainers, moderate alcohol drinkers had higher plasma folate concentrations and higher scores on the Mini Mental State Examination. However, women abstainers with the *CT* genotype had lower SDMT scores than did abstainers with the *CC* genotype or moderate drinkers with the *CT* genotype.

**Conclusions:** The 1561C→T polymorphism is associated with higher plasma folate and lower tHcy concentrations and with lower SDMT cognitive scores in women who abstain from alcohol.

**Key Words:** Glutamate carboxypeptidase II • *GCPII* • folate • homocysteine • cognition • gene polymorphisms

## This Article

- ▶ [Full Text](#)
- ▶ [Full Text \(PDF\)](#)
- ▶ [Purchase Article](#)
- ▶ [View Shopping Cart](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)
- ▶ [Citation Map](#)

## Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)
- ▶ [Get Permissions](#)

## Citing Articles

- ▶ [Citing Articles via Google Scholar](#)

## Google Scholar

- ▶ [Articles by Halsted, C. H.](#)
- ▶ [Articles by Tell, G. S.](#)
- ▶ [Search for Related Content](#)

## PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by Halsted, C. H.](#)
- ▶ [Articles by Tell, G. S.](#)

## Agricola

- ▶ [Articles by Halsted, C. H.](#)
- ▶ [Articles by Tell, G. S.](#)