

## Correlations of Plasma Kynurenines with Cerebrospinal fluid Levels, and their relation to Markers of Alzheimer's Disease Pathology and Cognitive Functioning.

poster

Lieke Bakker, Sebastian Köhler, Kyonghwan Choe, Daniel van den Hove, Gunter Kenis, Bart Rutten, Simone Eussen, Per Ueland, Frans Verhey, Inez Ramakers

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### Abstract

**Background:** The kynurenine pathway (KP) is the main route of tryptophan degradation, of which altered levels in blood plasma and cerebrospinal fluid (CSF) have been reported in Alzheimer's disease (AD) and other neurodegenerative diseases. However, it is largely unknown whether peripheral kynurenine concentrations in plasma resemble those found in the central nervous system and how they are related to AD pathology markers. We studied correlations between plasma and CSF kynurenine concentrations and their associations with CSF amyloid-beta (Abeta) and tau levels in memory clinic patients spanning the whole AD severity spectrum from subjective cognitive decline, mild cognitive impairment, and dementia.

**Method:** The Biobank Alzheimer Centrum Limburg (BBACL) study is an ongoing prospective cohort study of patients referred to the memory clinic of the Alzheimer Center Limburg for cognitive complaints. Blood plasma (n=806) and CSF (n=138) concentrations of tryptophan, kynurenine, kynurenic acid, 3-hydroxykynurenine, xanthurenic acid, anthranilic acid, 3-hydroxy anthranilic acid, quinolinic acid and picolinic acid were determined in a collaborative lab in Bergen, Norway, by means of liquid chromatography-tandem mass spectrometry. Additionally, CSF Abeta1-42, total-tau and phosphorylated tau were determined using commercially available single-parameter ELISA methods. To analyze the cross-sectional associations between kynurenine plasma and CSF concentrations and their relation to Alzheimer's disease markers and cognitive test scores, Spearman rank correlations and linear regression analyses were used.

**Results:** Plasma concentrations of tryptophan and all measured kynurenine metabolites were positively correlated with their corresponding CSF concentrations. Additionally, plasma and CSF concentrations of neopterin and CSF concentrations of kynurenic acid were correlated with t-tau and p-tau, but not with Abeta1-42. Lastly, concentrations of several kynurenines, including plasma xanthurenic acid, and CSF neopterin were significantly associated with cognitive test scores.

**Conclusions:** From a diagnostic viewpoint these results are promising, as the collection of plasma samples is less invasive compared to CSF.