Population based epidemiological studies have previously indicated that sudden death of a family member is a risk factor for SCD, suggesting a genetic component in its susceptibility. In the past years several genetic factors have been identified that seem to associate with this risk. Sudden cardiac death from ventricular fibrillation, VF, during myocardial infarction is the major component of this huge healthcare issue and is a leading cause of total and cardiovascular mortality. With this in mind we set up a database consisting of patients with and without VF, resp. cases and controls, during a first ST-elevation myocardial infarction, the Arrhythmia Genetics in the Netherlands, AGNES cohort. In this cohort with comparable clinical characteristics including all risk factors for coronary artery disease, a positive family history for sudden death was the most significant risk factor for VF indeed. In an AGNES-based genomewide association study for VF in this setting, the most significant association was found at chromosome 21q21 (rs2824292; odds ratio = 1.78, 95% CI 1.47-2.13, \( P = 3.3 \times 10^{-10} \)) 98 kb proximal of the CXADR gene, encoding the coxsackie and adenovirus receptor. This locus has not previously been implicated in arrhythmia susceptibility. Further research on the mechanism of this locus, which is currently carried out, will ultimately provide novel insight in arrhythmia mechanisms in this condition.

**Keywords:** genetics, myocardial infarction, sudden cardiac death