

**Manchester Interdisciplinary Collaboration for Research on Ageing (MICRA)
Seed corn grant 2014**

Title: Genetic and environmental causes of hearing loss and impact on cognitive and emotional well-being in older age

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Many people lose their hearing as they get older. Hearing loss makes communication more difficult, and people with hearing loss are more likely to experience loneliness and depression, cognitive decline and reduced physical well-being.

There is a strong genetic contribution to hearing loss, but we do not currently have a good understanding of exactly which genes make people more susceptible to hearing loss. Lifestyle-related experiences (including noise exposure, smoking, alcohol consumption, and diet) also make people more susceptible to hearing loss. Some of these lifestyle factors may interact with genetic factors.

In this study, we will search for markers of genetic risk for hearing loss. We will also explore interactions between genetic risks with lifestyle factors, as well as the consequences of hearing loss on people's cognitive and emotional well-being.

The present study will use data from the UK Biobank, which has genetic and hearing data for 164,770 UK adults. This will be the largest study of the genetics of hearing loss in the world that has been conducted to date. Findings will be tested in other data sets in the US (the Womens Genome Health Study) and the UK (the English Longitudinal Study of Aging).

A good understanding of how both genetic and environmental factors contribute to hearing loss and the cognitive and emotional consequences of hearing problems would allow i) promotion of lifestyles that could help us retain good hearing, mental health and quality of life in old age, ii) strategies to prevent hearing loss in people that are at higher genetic risk (such as hearing screening), and iii) identification of important biological targets for drug-based interventions to treat hearing loss.

The work funded by the MICRA seedcorn grant will allow us to build hearing genetics research in the UK and within Manchester to benefit UK adults.