Additional recording time-points and analysis will further contribute to the understanding of the natural history hearing loss progression in male Wistar rats as a model of age-related hearing loss.

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Hearing Impairment Directly Associated with Cognitive Function Decline: Results from the AGES-Reykjavik Study

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Background
Dementia mainly affects older adults and is a major contributor to the global burden of disease. There were 47 million people living with dementia globally in 2015 and this number is projected increase to 115 million by 2050. Hearing impairment (HI) is one of the most common chronic conditions worldwide. A meta-analysis indicated that 9% of dementia cases are linked to HI.

Objectives
Examine association between HI and cognitive function; identify factors directly associated with HI and cognitive impairment; estimate mediated indirectly effect of cognitive impairment on age-related hearing loss (ARHL).

Methods
The Age, Gene/Environment Susceptibility (AGES)–Reykjavik Study, examined a population-based cohort of 5,764 adults aged 66–96 years. Five years later, 3,411 subjects were followed-up. Better ear hearing was analyzed using the pure-tone average (PTA 0.5–1–2–4 kHz) threshold classification recommended by the Global Burden of Disease 2010 Hearing Loss Expert Group. Mild cognitive impairment (MCI) and dementia (MCI-D) were based on clinical assessment and a consensus meeting. Odds ratio (OR) and 95% confidence intervals (CIs) were calculated using multinomial logistic regression models. Bayesian Network analysis was used to identify direct risk factors associated with HI and MCI-D. The CAUSALMED procedure estimated causal mediation effects of MCI-D on ARHL.

Results
Prevalence of HI was: 40.5% (mild), 27.1% (moderate), 13.1% (moderately-severe or worse). Prevalence of dementia was 4.7% and MCI was 9.7%. Among those without HI, or with mild, moderate, moderately-severe or worse HI, prevalence of dementia increased from 1.4%, 3.6%, 5.8%, to 10.8%; prevalence of MCI increased from 3.5%, 7.3%, 13.9%, to 17.6%, respectively. After adjusting for potential confounding variables, better ear PTA (every 10 decibels) was significantly associated with increasing dementia (OR, 1.31; 95% CI, 1.18-1.46) and MCI (OR, 1.14; 95% CI, 1.05-1.24); whereas use of hearing aids was significantly associated with decreasing dementia (OR 0.53; 95% CI, 0.34-0.82). Dementia was significantly increased among those with moderately-severe or worse HI. Direct risk factors associated moderate-to-worse HI included sex, age, noise exposure, tinnitus, and cognitive impairment. Direct factors associated with MCI-D included age, depression, reduced leisure activities, lower education, and HI. Estimated 4% of ARHL was mediated through MCI-D. Sixty-three percent of MCI-D was associated moderate-to-worse HI directly and 36% was associated with aging.

Conclusions
Increased HI was associated with decreasing cognitive function. Use of hearing aids may reduce cognitive function decline. HI and MCI-D were direct risk factors for each other.

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Relating Perception of Temporal Fine Structure to Measures of Synaptopathy in the Gerbil

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Compromised processing of temporal fine structure and related deficits in perception have been attributed to synaptopathy. However, so far synaptopathy has not be convincingly linked to compromised perception (Bramhall et al., 2019, Hear Res 377: 88-103). Studies investigating cochlear anatomy, auditory brainstem responses (ABR) and perception in the same subjects are needed to make a strong link and probe for causality. Here we present data from such a study in Mongolian gerbils that allows to evaluate the evidence for a linkage.

Perception of temporal fine structure was investigated using the TFS1 test in five groups of gerbils: young

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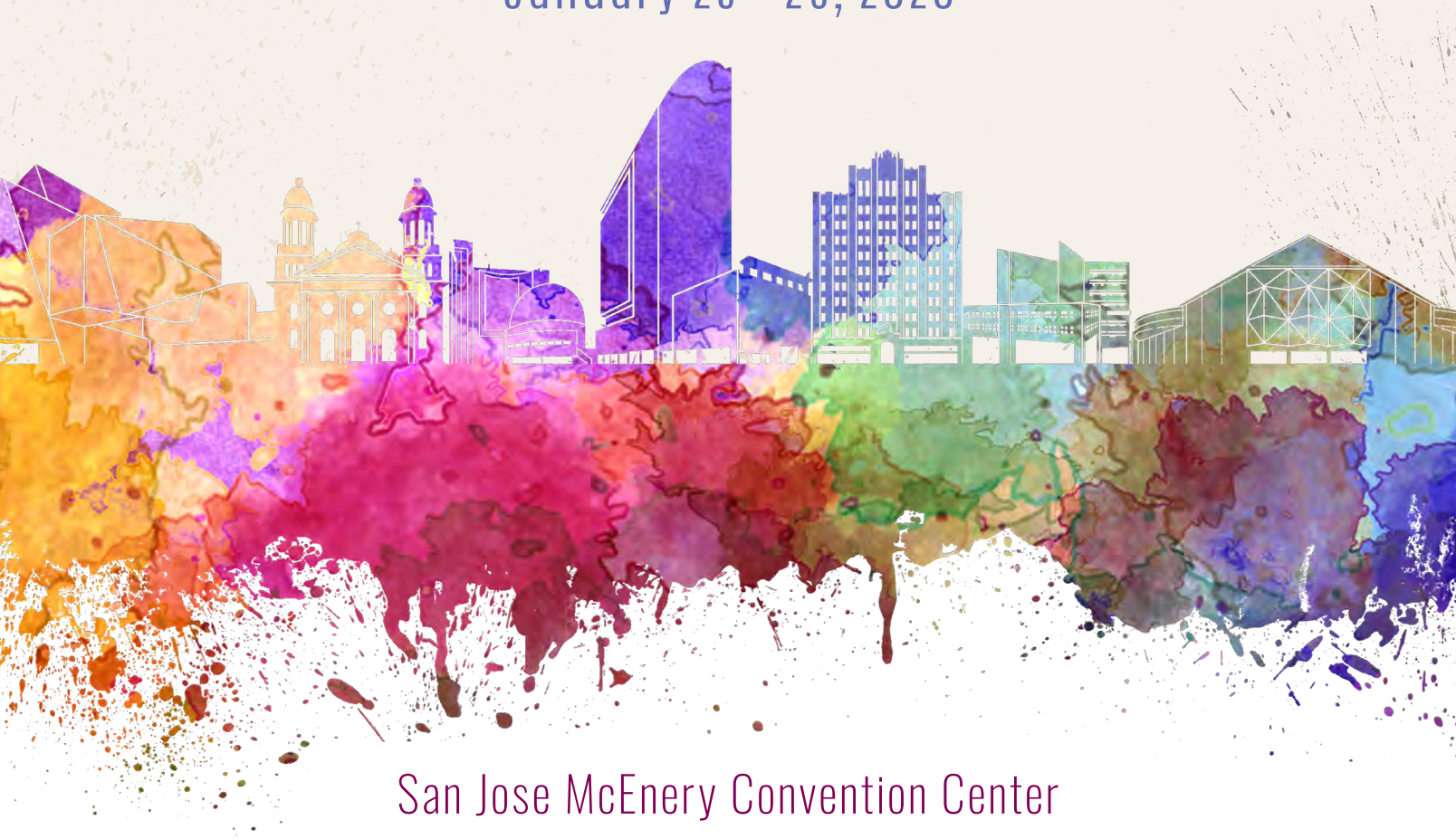

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