Global Center for Hearing and Speech Research

Colleges of Engineering and Behavioral & Community Sciences

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Nature vs. Nurture: What Determines Your Hearing as You Age?

Have you ever wondered if you will hear (or not) more like your Mother or your Father as you grow older? Research on the heritability of age-related hearing loss says, odds are you will hear more like your Mother. This stronger relation to your Mother's hearing in old age, hints that at least a portion of how well you will hear as you grow older is genetic, or determined by Nature. Yet, even though this relation to your Mother's hearing has been known for two decades by geneticists studying age-related hearing loss – presbycusis – the human genes that may pre-dispose us to poor hearing in old age remain elusive. Biomedical engineers and hearing scientists at the Global Center for Hearing and Speech Research at the University of South Florida have been using the mouse as an animal model to gain new insights into possible genes related to presbycusis. These Global Center researchers have developed new statistical and bioinformatics data analysis techniques to analyze large amounts of mouse genetic data in novel ways. By using the mouse as a "genetic" animal model for studying age-related hearing loss, new knowledge can be gleaned about what types of genes contribute to presbycusis in humans. Discoveries in this area point to the possibility of genes involved in inflammation and the immune system, and genes related to key neurochemicals used in nerve cell communication, as contributing to the severity of presbycusis. These animal model findings give Global Center researchers clues as to what genes to look for in humans that might accelerate the progression of age-linked hearing loss.
Want to learn more:
Tra, Y., Frisina, R.D. D'Souza, M., (2011) A novel high-throughput analysis approach: Immune response-related genes are up-regulated in age-related hearing loss. *Open Access Bioinformatics.*

D'Souza, M., Zhu, X., Frisina, R.D. (2008) Novel Approach for Selecting Genes from RMA Normalized Microarray Data Using Functional Hearing Tests in Aging Mice. *J. Neuroscience Methods*, 171:279-287. (PMCID: PMC2440495)

Xiao, Y., Frisina, R.D., Gordon, A., Klebanov, L., Yakovlev, A. (2004) Multivariate Search for Differentially Expressed Gene Combinations. *BMC Bioinformatics*, 5:164-184.