Hair cell regeneration in mature inner ear in vivo by drug-like molecules

Principal Investigator: Zheng-Yi Chen, D.Phil, Massachusetts Eye & Ear

Hair cell loss is the major cause of permanent hearing loss in humans. Strategies to overcome irreversible cochlear hair cell damage and loss in mammals are of vital importance to hearing recovery. We recently demonstrated that the combination of Myc/Notch1 activation is sufficient to reprogram adult cochlea and regenerate hair cells in response to transcription factor Atoh1 in adult transgenic mice. To move our work towards clinical application it is necessary to achieve reprogramming and hair cell regeneration in wild-type adult mammalian inner ear by a clinically relevant approach. The grant application aims to achieve reprogramming by drug-like molecules (small molecules and siRNA) for hair cell regeneration *in vivo*, to lay the foundation to move our work towards clinical application.