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A continuous supply of BDNF is necessary for sustained auditory neuron survival in deafened guinea pigs.

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Neurotrophic factors are well known to be involved in the development and maintenance of the auditory system, and have also been reported to act as survival factors for auditory neurons in both *in vitro* and *in vivo* deafness models.

In this study we tested the longevity of the survival effects of brain-derived neurotrophic factor (BDNF) on auditory neurons in deafened guinea pigs – specifically, we aimed to determine if a single dose of BDNF is sufficient to maintain auditory neuron survival following loss of hair cells, or whether sustained delivery is required.

Normal hearing guinea pigs were bilaterally deafened, and the left cochleae infused with 200µl BDNF (62.5µg/ml) over a period of 28 days via a cannula connected to a mini-osmotic pump. The right cochleae acted as deafened and untreated internal controls. Survival periods following the completion of the BDNF treatment varied from zero to two or four weeks. For all surgical procedures, guinea pigs were anaesthetised using ketamine (40mg/kg) and xylazil (4mg/kg). Treatment with BDNF prevented the degeneration of auditory neurons normally seen following loss of hair cells, however, upon cessation of BDNF delivery, auditory neuron survival rates dropped rapidly, indicating that if trophic factor therapy is to be used in the treatment of hearing loss, continuous delivery is likely to be necessary.