

Soundbite

September 2008

Soundbite is emailed every other month, keeping you up-to-date with the latest news from Deafness Research UK and information on medical research and treatments worldwide.

IN THIS ISSUE

Events : stop press

- » [Meet the Scientists - free tinnitus event in London](#)
- » [London Marathon 2009](#)

Information & advice

- » [Audiology waiting times](#)

News

- » [Write your Will for free](#)
- » [New Head of Individual Giving](#)
- » [The Bionic Ear Show](#)

UK Research

- » [Fruit flies have ears like humans](#)
- » [Hair cell shape fine-tunes sound signals](#)

International Research

- » [Human umbilical cord stem cells repair damage to the inner ear of mice](#)

EVENTS : STOP PRESS

Meet the Scientists – free tinnitus event in London

2pm-5pm, Wednesday 1st October 2008

We still have places available for this event. [Click here for more information](#). The event is free to attend but pre-booking is essential. Please contact Gemma Leary on 020 7833 1733 or gemma.leary@deafnessresearch.org.uk for more details.

London Marathon 2009

Sunday 26th April 2009

We have several guaranteed entry places still available for the 2009 Flora London Marathon. If you would like the chance to run the most famous marathon in the world, whilst raising vital funds to help the millions of people affected by deafness and related conditions, [click here for information on how to apply](#).

» [top](#)

INFORMATION AND ADVICE

Audiology waiting times

"My GP has just referred me for hearing tests as I have been struggling with my hearing and he has suggested I might benefit from a hearing aid. My concern is, will it take months before I get an appointment and even longer before I am fitted with a hearing aid? Can you advise me of the current situation regarding audiology waiting times?"

Audiology waiting times have for a long time been unacceptable; this has been due to underinvestment in the staffing resources across audiology within the NHS, coupled with massive increases in demand for treatment as a result of the Modern Hearing Aid Screening (MHAS) Project of 2000. However, as a result of audiology services nationally reviewing their working practices and a lot of additional hard work, this situation is improving across the country and recent figures from the Department of Health show that the situation is improving.

According to the Care Services Minister, Ivan Lewis, data which has been collected since 2006 showed initially that over 100,000 patients waited more than six weeks for a hearing test, and of these over 30,000 waited more than a year. Now, however, the majority of patients are being seen within six weeks, with average waits lower still.

Figures for May 2008 showed that of 31,310 patients waiting for audiology tests, 29,158 waited for up to 6 weeks, with the much smaller number of 2,152 patients waiting for longer than six weeks.

Out of the NHS diagnostic tests currently being measured, which include MRI and CT scans, audiology assessments still make up the highest proportion of long waits, but are falling steadily. Between May and June 2008, over six-week waits fell by 250 (11.5%) to 1,900.

The signs are encouraging that many NHS trusts will meet the Government target that by the end of 2008 no one will have to wait longer than 18 weeks from GP referral to commencement of hospital treatment.

In Wales, the target wait is less, being 14 weeks. At the end of June 2008, just over three quarters were fitted within this target, with the remainder taking up to 24 weeks.

In Northern Ireland, in the second quarter of 2008, of 3,461 hearing aid assessments and re-assessments completed, 99 per cent were done in less than 12 weeks, with the remaining one per cent taking between 12 to 24 weeks.

Unfortunately, we cannot comment on the situation in Scotland as data will not be available until April 2009. The Government target in Scotland is also different, with audiology waiting times not to be included in the 18-week referral to treatment standards until 2011.

To conclude, there is a high probability that you will not have to wait too long for your hearing aid, but to get a better idea of the situation locally; we suggest that you contact your local hospital audiology department.

However, one further thing you may be interested to know is the latest generation of hearing aids known as open fit do not require the use of an earmould like a traditional hearing aid and can be fitted in one appointment. This style of fitting, whilst not suitable for all types of hearing loss, is proving to be successful and popular with patients and is now being rapidly introduced across the NHS and is having a significant effect on reducing referral to treatment times.

The Deafness Research UK Information Service specialises in providing accurate and impartial information and advice based on the most recent scientific research. If you have a question about any aspect of hearing loss, ear problems or tinnitus, please call the Deafness Research UK Information Service on 0808 808 2222 or email info@deafnessresearch.org.uk.

Further information

» [Information Service](#)

» [top](#)

UK RESEARCH

Fruit flies have ears like humans

You may remember that Jörg Albert took up the second Deafness Research UK Fellowship at the UCL Ear Institute at the start of this year, to study the mechanics of hearing. This month, the journal *Current Biology* has published a paper on a vital piece of research conducted by Dr Albert and his former colleagues at the University of Cologne, showing that the inner ear of the fruit fly is remarkably similar to that of vertebrates, including humans.

Björn Nadrowski, Jörg T. Albert and Martin C. Göpfert report a mathematical model of the process, known as transduction, used by *Drosophila melanogaster*

(the fruit fly) to transform mechanical energy from sound waves into electrical signals. During transduction the inner ear mechanically amplifies sound signals and this action is critical for normal hearing.

In vertebrates, transduction is performed by hair cells which send the electrical signals on to the brain, where they are understood as sounds. However, there are important structural differences between the inner ear of vertebrates and invertebrates like the fruit fly. Until the present study, these differences had lead researchers to believe that transduction must work on different principles.

The research team compared real data, from measurements of the amount of cochlear amplification found in the fruit fly inner ear, to the output of their model and found that around 20 transducers per sensory cell are enough to describe the real data accurately. This is the same as the number of "hairs" on a hair cell. Their results both describe the hearing organ comprehensively and open up the field of deafness research to *Drosophila* genetics. By manipulating the genes which control the transducers, scientists can identify which molecules are involved in allowing hair cells to send signals to higher brain centres.

"The biophysical parallels between the ways both fruit flies and humans convert sound into nerve signals are truly amazing. We may be allowed to hope that these mechanistic similarities extend further down to the genes and molecules that bring about hearing. But even if it finally should turn out that hearing in fruit flies relies on different molecules than does hearing in humans, the little fruit fly can help us find answers to some key questions of hearing research and, what is sometimes even more important, will surely help us ask the right questions," said Dr Albert.

Further information

» [How the ear works](#)

» [top](#)

Hair cell shape fine-tunes sound signals

Scientists from the UK and Germany have recently discovered the first evidence that hair cells in the inner ear that process high-pitched tones are different to the cells that process lower pitches. The research, which was reported recently in *The Journal of Neuroscience*, was conducted with support from Deafness Research UK by Dr Walter Marcotti at the University of Sheffield, with colleagues in Tübingen, Germany and at the UCL Ear Institute in London.

The ability to function with precision-timing is essential for the cochlea to represent the patterns in sound waves accurately. In mammals this ability depends on the release of neurotransmitters, the chemical signals that brain cells use to communicate with each other, from inner hair cells to the neurons that carry the sound signal onward to the brain. The new research shows that the way neurotransmitters are released varies along the length of the cochlea.

"An understanding of the underlying physiological characteristics of hair cells is essential for the success of future methods intending to regenerate or re-implant these cells into abnormal cochleae. This type of fundamental study could aid the generation of hair cells with characteristics that are specific to a defined region of the cochlea," said Dr Marcotti.

It has long been known that high-pitch tones are processed by hair cells at the base of the cochlea and low pitches are processed at the apex. Previous thinking held that in mammals this difference was just due to their position along the cochlea rather than any differences in the type of cell.

However, it turns out that the point, known as the ribbon synapse, from which the neurotransmitters are released has a spherical shape for higher pitches and an ellipsoid shape for the lower. It seems that this difference in shape may affect the hair cell's ability to keep on signalling a repetitive sound, with low-frequency cells giving up sooner than the higher pitched ones..

Further information

» [Hearing loss](#)

» [top](#)

INTERNATIONAL RESEARCH

Human umbilical cord stem cells repair damage to the inner ear of mice

An Italian research team has shown that damage to cells in the inner ear can be repaired by stem cells transplanted from a human umbilical cord. The study, published in the journal *Cell Transplantation*, gives new hope that hearing loss due to cochlear damage can be reversed.

Roberto P. Revoltella and colleagues introduced stem cells, known as hematopoietic stem cells (HSC), into mice that had inner ear damage from noise, chemical toxicity, or both. Only the groups that received the HSC showed cochlear regeneration. HSC cells were traced, using a fluorescent marker, in order to see whether they had migrated into the cochlea. Migrating there would mean they were literally in a position to help regenerate damaged sensory cells.

"Our findings show dramatic repair of damage with surprisingly few human-derived cells having migrated to the cochlea," said Dr Revoltella. "A fraction of circulating HSC fused with resident cells, generating hybrids, yet the administration of HSC appeared to be correlated with tissue regeneration and repair as the cochlea in non-transplanted mice remained seriously damaged."

The results also show that less cochlear regeneration occurred in the group that was given HSC after noise damage than in the chemical toxicity group, which suggests that noise damage was the more severe. The greatest regenerative effects were found in mice given the most HSC. Interestingly, the team also found that cochlear tissue repair improved over time.

"This work highlights just how relevant this type of research is and provides new hopes for novel therapeutic approaches" said Dr Marcelo Rivalta of the University of Sheffield, who is working on a project supported by Deafness Research UK to restore hearing by generating replacements for damaged hair cells from human bone marrow and umbilical cord stem cells.

Commenting on the fact that the cells migrated to the ear having been introduced elsewhere in the body, Dr Rivalta added, "If it is proven that no unwanted side effects have taken place in the rest of the body, this will facilitate the treatment's development by not depending on a complicated and invasive ear surgery to deliver the cells".

Further information

» [Hearing loss research](#)

» [top](#)

NEWS

Write your Will for free

Solicitors all over the UK have once again agreed to participate in Will Aid, a scheme which allows people to have their Will drawn up or amended for free throughout November 2008.

Will Aid now happens every year, making November the National Make a Will Month.

Will Aid solicitors volunteer their time free of charge to draw up basic Wills, or to add codicils to existing Wills, in return for a small on-the-day donation to Will Aid.

There is no obligation to leave a charitable legacy. However, remembering Deafness Research UK in your Will is a wonderful way of leaving a lasting memorial and one of the most cost effective ways of supporting our work. Many of the most important breakthroughs we have seen in hearing research could not have been made without the generous legacies left by our supporters.

By remembering the work of Deafness Research UK in your Will now you will be helping to fund vital research in the future, helping us to make a difference to the lives of millions of people.

To find a solicitor in your area who is taking part in the scheme, or to receive a copy of our legacy information pack, please contact Gemma Leary on 020 7833 1733 or gemma.leary@deafnessresearch.org.uk.

Further information

» [Leave a legacy](#)

» [top](#)

New Head of Individual Giving

John Blake has been appointed as Deafness Research UK's new Head of Individual Giving. The post has been created to maximise future revenues from individual donations and legacies.

John was previously with the Motor Neurone Disease Association where he was the Head of Supporter Development overseeing direct marketing, legacies, tribute funds and membership. Prior to that, he worked at the Parkinson's Disease Society, the Notting Hill Housing Trust, and Sense.

This latest senior appointment at Deafness Research UK comes shortly after the appointment of Ruwan Perera to the new position of Director of Development. John Blake will work closely with Ruwan and the charity's CEO, Vivienne Michael, forming the new senior management team who will collectively map out the strategic direction of the charity for the coming months and years.

Deafness Research UK's CEO, Vivienne Michael, said, "We are embarking on a major change management programme within the charity, to which both John and Ruwan will contribute significantly. John has a wealth of knowledge and experience in the sector and a great track record of achievement. We are confident he will help the charity develop to the next level and generate the funds we need for vital additional research programmes.

"Our Head of Individual Giving will play a major role in attracting further funds from individual donors, expanding our community fundraising activities as well as securing increased legacy income for the charity which we will use to fund future research programmes into deafness, tinnitus, and other deafness-related conditions.

"There are nine million people in the UK who are deaf or hard of hearing. They range from babies who are born with no hearing at all to over six million people over the age of sixty who are gradually losing their hearing as they age. Millions more have hearing problems such as tinnitus and complex conditions such as deaf-blindness.

"As the only national charity dedicated to research in this field, Deafness Research UK has a key role to play and our track record of identifying and backing the best, high impact research is impressive. We have played an important part in some of the most significant advances of recent years from new screening tests to identify deaf babies at birth to improving implants that restore sound to totally deaf people. With research entering a new and exciting phase in which medical cures are becoming a real possibility, we must expand our grant-making significantly to meet the need for new people and programmes in UK hearing research."

Further information

» [About Deafness Research UK](#)

» [top](#)

The Bionic Ear Show

The Bionic Ear Show is to feature in this year's Science Week Ireland, from 9th-16th November. Other dates will be announced shortly. For further information, including dates, times and ticket details, please contact Sophie Cowles on 020 7679 8965 or sophie.cowles@deafnessresearch.org.uk.

The Bionic Ear Show tells the story of sound as it travels through the ear to the brain, what happens in different parts of the hearing system, and how each part of the system can fail or break down. The show aims to raise awareness of the importance of hearing, how it can be damaged and what you can do to protect it.

Further information

» [The Bionic Ear Show website](#)

» [top](#)



registered charity no. 326915

Contact the Deafness Research UK Information Service via:

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