The Ear Institute opened for business on the 1st January 2005, bringing together on a single site academic scientists and their research groups from across UCL, from fields as diverse as human genetics, biophysics, molecular and cellular biology, systems and computational neuroscience and imaging technologies. The five years that have elapsed since have witnessed a period of remarkable growth - world-leading academics have been joined by some of the world’s best young researchers to create a genuinely collaborative research environment, ensuring that the Ear Institute is geared to deliver on its mission of ‘Understanding Hearing - Fighting Deafness’. The forging of ever-closer links with the Royal National Throat Nose and Ear Hospital (RNTNEH) and the recruitment of world-leading clinician-researchers culminated, in November 2009, in the development of ‘UCLP-ENT’, one of the official Programme Themes of UCL Partners, UCL’s Academic Health Sciences Centre (AHSC).

The next five years at the Ear Institute promise to be just as exciting as the first. Complex scientific and clinical problems - understanding the neural basis of hearing, the cellular, molecular causes of deafness and tinnitus, investigating the genetic pre-disposition to age-related deafness, refining treatments for disorders of the head and neck, enhancing the communication outcomes for the profoundly deaf – all of these issues and more will require the skills of a wide range of researchers, clinicians and professional organisations to solve. With access to world-class resources and active engagement with industrial partners the charity sector and government agencies, the Ear Institute seeks to ensure sustained improvements in the health and well-being of patient groups, their families and society as a whole.

Prof David McAlpine
Director and Professor of Auditory Neuroscience

The Ear Institute Newsletter is a quarterly update on our research and teaching achievements to demonstrate our progress and activities that are impacting on the world of hearing and ENT.

Editors: Dr Debi Vickers Kate Faxen

www.ucl.ac.uk/ear facebook/earinstitute #uclearinstitute
Getting involved

Research at the UCL Ear Institute goes beyond lab based exploratory investigations into front line human applications. Scientists from the Ear Institute have revolutionised many aspects of modern ENT healthcare, hearing rehabilitation and diagnosis.

We have received over £7,000,000 of research funding from Charities and research councils, but we need volunteers to make it count. We have a carefully managed participant database and we contact participants whenever a study comes up that they may be interested in. We also email a quarterly newsletter so you know what progress is being made.

Ways to participate range from filling in a one off questionnaire to regular listening experiments carried out here at the UCL Ear Institute, DNA sample donations to hearing aid trials. For children we have listening games and training programmes.

If you wish to take part in one of our studies, please visit the participate section of our website: www.ucl.ac.uk/ear/participate

New starters

Turning research into treatments

Dr Denise Goldman
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Our ultimate goal at the Ear Institute is to develop new treatments and improve existing medical interventions for hearing loss and tinnitus. To do this the EI is cultivating a pipeline of research spanning: discovery research, which allows us to understand the biology of hearing; translational research, where we investigate how the research can become a potential treatment; preclinical research, where a potential treatment is optimised before being tested on patients; and finally clinical research, where a treatment or new device is tested on patients. Dr Denise Goldman has recently joined the EI to help scientists turn their research into treatments by working with industry and government bodies that provide specialised funding and support for translational, preclinical and clinical research. Denise is a trained stem cell biologist and has previously worked at Action on Hearing Loss, establishing their Translational Research Initiative for Hearing (TRIH) and forming close links with companies and investors interested in new treatments for hearing loss and tinnitus.
New insights into deaf-blind syndrome?
Alström Syndrome (ALMS) is a debilitating inherited disease that causes deaf-blindness, as well as major organ failure. Only one causative gene has been identified (ALMS1), which codes for a full length protein of 461 kDa (Collin et al, Nature Genetics 2002; Hearn et al, Nature Genetics 2002; Hearn et al, Diabetes 2005). This protein has been localised to the ciliary basal body (Hearn et al, Diabetes 2005), leading to ALMS being classified as one of the family of ciliopathies. The full length protein was recently shown to be ubiquitously expressed in the inner ear (Jagger et al, Human Molecular Genetics 2011).

Like many other genes, ALMS1 expresses a number of splice variants (shorter versions of the full length protein), although potential roles of these proteins have not been explored. In this new paper by Dr Dan Jagger and collaborators at the Jackson Laboratory, one of these variants is shown to interact functionally with various proteins, including α-actinin family members and the unconventional myosin MYOVb, which are associated with the normal function and maintenance of the cytoskeleton. The protein was co-localised with α-actinin to organelles which are known to be part of the endosomal recycling pathway, which regulates the intracellular trafficking of key molecules. The short splice variant was also localised to the acto-myosin ring, a structure formed from the cell’s cytoskeleton which controls the final stages of cell division.

These findings suggest that the ALMS1 gene may be involved with previously unexpected cellular roles, and may help explain some of the unexplained complexities of Alström Syndrome that restrict and foreshorten patients’ lives.

The Alström Syndrome Protein, ALMS1, Interacts with α-Actinin and Components of the Endosome Recycling Pathway.


http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0037925

More recent publications

Otosclerosis research project
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Otosclerosis is a common cause of hearing loss, affecting approximately 1 in every 300 individuals in the UK, usually young adults. It is known to be an inherited condition but currently very little is understood about the genes involved in its development. Although surgical techniques are moderately successful in restoring hearing loss in individuals with this condition, they are not without their risks. It is therefore crucial to improve our understanding of the disease process in order to develop new therapeutic options in the future.

Through a unique collaboration between Dr Sally Dawson’s laboratory at UCL Ear Institute and Professor Shakeel Saeed at the Royal National Throat Nose and Ear hospital, research is underway to investigate the genetic causes of otosclerosis. It is hoped that an improved understanding of genes involved in otosclerosis will ultimately lead to earlier diagnosis, disease prevention and novel treatments. It is of importance that clinical and scientific teams work closely together in order to ensure that any new findings are rapidly developed for the best possible benefit of patients.

The research team is looking to recruit individuals who have a diagnosis of otosclerosis. If you have undergone stapedectomy surgery, are expecting to receive surgery in the future, or are managing your hearing loss in other ways, we would like to hear from you.

If you are interested in learning more about this study, please call or email PhD student Joanna Ziff, providing your name, address and contact details. We look forward to hearing from you.

Hearing after a stroke
Dr Doris-Eva Bamiou
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We (DE Bamiou and team of researchers & clinicians at Ear Institute and National Hospital for neurology) have started our study of hearing after stroke, that aims to assess patients hearing deficits and needs after stroke and explore some novel management options to address these. We would welcome any members of the public who have had a stroke as volunteers to be tested!

This study has now received funding from the BMA Helen Lawson fund.
We are comparing the listening and language skills of two groups of children: those who use two hearing aids and those who use two cochlear implants. The aim is to develop guidance on which children should be offered cochlear implants in the future.

Sixty-eight children aged between 3 and 6 years are enrolled in the study.

On average, children with a profound hearing impairment who use cochlear implants show listening and language skills that are similar to those of children with a severe hearing impairment who use hearing aids.

The children in this study showed an average language delay of 12 months. This delay highlights the need for educational services to continue to provide extra support for children with hearing impairment.

At the moment, the National Institute for Health and Clinical Excellence recommends that children with severe-to-profound hearing impairment should be offered cochlear implants. Early analyses of our data suggest that these guidelines are appropriate and do not need to be changed. However, we need to gather more data before we can draw firm conclusions from the study. Also, some of the benefits of cochlear implants and hearing aids take time to emerge, so it is crucial that we see children for a second assessment one year after they joined the study.

Children are grouped according to the severity of their hearing loss (moderate to profound) and whether they use hearing aids or cochlear implants. The circles show average (mean) scores for each group. The error bars show one standard deviation. Typically-developing children have a language delay of zero months, on average.
Cochlear implant fitting study
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At the UCL Ear Institute we have been looking at “pitch” perception as a means to adjust fitting to try to improve speech understanding. We have worked with 30 adults with cochlear implants to see if the approach works.

Our approach is to see if each electrode sounds different to the others and if electrodes don’t have their own sound we switch them off.

In this research people tried out the new “pitch programmes” for a month and speech perception tests were carried out to find out if the original clinical programme or the “pitch programme” was the best.

We tested 30 adult cochlear implant users and found:

- 5 people who heard the differences between all pitches so did not need a “pitch programme”
- 15 people who showed statistically significant improvements on our speech tests
- 5 people who reported benefit but it did not show up in the testing
- 5 people who did not gain any benefit at all from the “pitch programme”

The results showed that on average there was a significant improvement for listening to sentences in quiet and noise with the “pitch programme”. We are trying to understand better why some people gain benefit and why some people do not.

Thanks to all our participants.

Changing ‘deafness’
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The ability to detect changes around us, such as the appearance or disappearance of an object, has far-reaching implications for survival. The auditory system is commonly assumed to play a key role in the brain’s change-detection network by serving as an ‘early warning device’, rapidly directing attention to new events in the scene.

We are aiming to understand how listeners detect and process change-events in auditory scenes and specifically what makes certain change events ‘pop-out’ and grab attention while others go unnoticed. We use behavioural methods to evaluate performance, and functional brain imaging to identify the brain mechanisms involved. Our experiments reveal that listeners are generally very sensitive to changes in sound pattern. However, when different events come in close temporal succession certain changes (even if they are very salient in isolation) are likely to be completely missed by listeners.

Understanding what acoustic events tend to be detected and, more importantly, which ones are likely to be missed by listeners is crucial for designing human-computer interfaces, and other devices intended to help professionals (operating room personnel, air traffic controllers, pilots, etc.) operate effectively in environments where the detection of change is critical.

This Project is funded by Deafness Research UK and the Wellcome Trust.
Research updates

Research changes clinical practice!
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Translational research investigating Aminoglycoside (AG) ototoxicity in children with Cystic Fibrosis (CF) from an audiological and genetic perspective has advocated change in the management of these patients at Great Ormond Street Hospital (GOSH). This is part of a PhD project under the supervision of Prof. David Kemp and Dr Sally Dawson from the Ear Institute (EI) and Dr Ranjan Suri and Dr Tony Sirimanna at GOSH.

One of the aims of the study was to investigate the incidence of AG ototoxicity in children with CF. Seventy children at GOSH were tested using standard and high-frequency audiometry and Distortion-product Otoacoustic Emissions.

The results showed a higher incidence of hearing loss caused by the medication than previously shown. There was also found to be a relationship with genetic mutations associated with increased susceptibility to ototoxicity.

These outcomes have prompted clinicians to establish a link with the Audiology department to include audiological monitoring and rehabilitation within the protocols of care for CF children and to advocate genetic screening in order to be able to make informed patient management decisions.

Cochlear micromechanical lab
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During the coming month, a cochlear micromechanical laboratory will be established at the Ear Institute that allows sensitive micromechanical measurements using laser-vibrometry in the living hearing organ. Less than a handful of such experimental facilities exist worldwide. The project is funded by the charity Action on Hearing Loss and led by Dr Torsten Marquardt. Crucial for success is the external support by Dr Nigel Cooper, one of the leading specialists in this field. He contributes not only expertise, but also equipment.
Teaching updates

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This has been a busy and challenging year for Audiology, as the funding for training and service provision pressures have become more apparent. At the Ear Institute, we took in our last cohort of the 4-year undergraduate programme, who have all been doing well.

Dean’s list
Following the examinations, we were very pleased and proud that the following students made the Dean’s List which recognises outstanding achievement:

- George Fereos
- Bhavisha Parmar
- Hannah Williams

This is reflective of 4 years of hard work and dedication. Other students making their mark in this academic year, and achieving awards at our Awards and Poster presentation event held on the 6th June 2012 were:

- Nasreen Hasnani
- Manisha Gossan
- Amy Jauncey
- Bhavisha Parmar
- Saima Rajasingam
- Fatema Dhanji
- Gabrielle Talon
- Roshni Pandya
- Hannah Williams
- Bhavisha Parmar
- Nira Patel
- Elinor Willis
- Nora Macdonald
- Lorraine Lucas
- Sophie Waterfall
- Jocelyn Wright
- Caroline Leal
- Konstantinos Tsioulos
- Alpana Kulkami

Full details of prizes can be found on the Ear Institute website. http://www.ucl.ac.uk/ear/courses/prizesceremony

Thanks to all the prize sponsors: Advanced Bionics, Biosense Medical, Cochlear, Coselgi, Guymark, InHealth, MedEl, Neurolec, Oticon, Otodynamics, Otometrics, PC Werth, Phonak, Starky, Widex, Your World.

In other news, the collaboration between Middlesex University, NHS London and the Ear Institute has made exceptional progress in under a year, and following a successful validation and accreditation process, the EI will be providing the teaching and clinical training aspects in Middlesex University’s 3-year BSc Healthcare Sciences (Audiology) programme. The first intake is the coming academic year and we are looking forward to contributing to and having an impact on the future London Audiologists.

Our Masters programmes are going from strength to strength and the increasing numbers of delegates on the Masterclasses are encouraging and that we are delivering the level of training and CPD the profession requires in innovative ways. The MSc in Audiological science is undergoing a revamp, so watch this space, and visit our website and Facebook pages for regular updates.

We wish all our students well over the summer break, and look forward to welcoming them back in September. Finally we wish all our graduates the very best for the future as they embark on their Audiology careers!
In the media

Prof Adrian Davis interviewed on BBC Breakfast
As Director of the NHS Newborn Hearing Screening Programme, Professor Adrian Davis was interviewed on BBC Breakfast to mark the 5 millionth baby screening which took place in Manchester.

Nearly 9,000 children with hearing impairment have better chances of success at school and their parents are better prepared to support them thanks to the introduction of an NHS programme to detect hearing problems in the first days of a baby’s life. Wednesday 16th May, 2012, marked the five millionth baby in England to be screened by the Newborn Hearing Screening Programme (NHSP) since the programme began in 2001.

Bridgitte Harley helps Eastenders actress Rita Simons on BBC Three documentary
Ear Institute was on BBC again, when audiology lecturer Bridgitte Harley helped Eastenders actress Rita Simons cope with some of the decision making related to her six-year-old daughter’s hearing loss.
http://www.bbc.co.uk/news/health-17365141

Priya Singh appears on Bang Goes The Theory
Our very own Dr Priya Singh talked to Dallas Campbell about the structure of the ear, and what causes hearing loss on the popular BBC science show Bang Goes the Theory.
http://www.bbc.co.uk/playlist/episode/b01dzmbs/Bang_Goes_the_Theory_Series_6_Is_Life_Too_Loud

Prof Martin Birchall quoted in BBC Health article
Prof Martin Birchall is quoted in a BBC health story about organ regeneration.
http://www.bbc.co.uk/news/health-16679010

Doris-Eva Bamiou interviewed for Canadian broadcasting series
On 6th July Dr Doris-Eva Bamiou, clinical senior lecturer & consultant, was interviewed for a Canadian broadcasting series on chronic dizziness. This series is funded by a Canadian Institutes of Health Research Journalism Award. I have been asked to discuss causes, difficulties in diagnoses, treatments, impact on mental health and other psycho social issues of dizziness.
Grants and awards

Prof David McAlpine, Dr Torsten Marquardt, Dr Bradford Backus

ABCIT Grant

Advancing Binaural Cochlear Implant Technology

Members of the Ear Institute have been awarded an EU grant (ABCIT) for Euro 4 million, which is due to commence 1 September 2012 for 36 months. There are four project partners within the consortium:

• UCL Ear Institute (project lead)
• Neurelec
• University of Oldenburg
• Hortech

Dr Jenny Bizley’s grant success

Many congratulations to Dr Jenny Bizley on her £1M+ grant success – the Wellcome Trust/Royal Society Henry Dale Fellowship. Her project title is “Listening in a noisy world: the role of visual activity in auditory cortex for sound perception” we’ll keep updated with her progress.

Well done Jenny, richly deserved.

Jane Mattley receives UCL Impact Award and Deafness Research UK PhD studentship

Double congratulations to Jane Mattley, an MSc Neuroscience student who has been working with Dr Jennifer Linden and Dr Lucy Anderson, on receiving a UCL Impact Award and a Deafness Research UK PhD Studentship to continue her research at the Ear Institute as a PhD student. She will be studying cortical, thalamic, and midbrain abnormalities in a mouse model of risk factors associated with human neurodevelopmental disorders such as dyslexia.

Dr Jannis Hildebrandt receives Bogue Fellowship

Well done to Dr Jannis Hildebrandt, a postdoctoral fellow in Dr Jennifer Linden’s laboratory, who was awarded a Bogue Fellowship from UCL to attend the 3-week Summer Workshop on optogenetics in the laboratory of Professor Karl Deisseroth at Stanford University, USA. Dr Hildebrandt will be applying what he learns about these novel research methods in a project aimed at analysing the roles of different inhibitory interneurons in auditory cortical function.

Events and seminars

Internal seminars

Our internal seminars may not be confirmed until a week or so in advance. An up to date list can be found on the website: www.ucl.ac.uk/ear/eartalks

18 July 2012 - Lucy Handscomb

Grand Round: Introducing a research project designed to help tinnitus patients to get a better night’s sleep

20 July 2012 - Dr Jenny Bizley

ECJC: Role of Cat Primary Auditory Cortex for Sound-Localization Behavior, Jenkins & Merzenich

25 July 2012 - Prof Tony Narula

Grand Round: ENT Services - The Future

Next short course

Full information about all of our short courses can be found on the website: www.ucl.ac.uk/ear/courses/shortcourses

3-6 October 2012

Course organiser: Professor V Lund

GIR: An Endoscopic Approach to Rhinosinusitis
Other news

Cilia 2012
In May Dr Dan Jagger co-organized “Cilia 2012” the first international scientific conference on cilia biology, which was held at the Institute of Child Health. The conference began with a reception at the British Medical Association, where the 280 delegates got the chance to meet ciliopathy patients and support groups based in the UK. The theme of the conference - “Cilia in development and disease” - ran through a total of 5 sessions over the next 2 days. These included: clinical and novel aspects of ciliopathies, structure and function of cilia, cilia and development, cilia and disease, which included the potential for “cilio-therapeutics”. There were a total of 40 talks and 140 poster presentations. This was the first international scientific conference organized by the Ciliopathy Alliance (www.ciliopathyalliance.org) with support and sponsorships from various organizations including Deafness Research UK (www.deafnessresearch.org.uk). Plans are afoot for Cilia 2014.

Alström Syndrome UK Sponsored Torquay to Birmingham cycle ride
In June Dr Dan Jagger organized and took part in a sponsored cycle ride from Torquay to Birmingham, in aid of Alström Syndrome UK (www.alstrom.org.uk). The ride was undertaken by patients, clinicians, and scientists, to raise awareness of the syndrome, commemorate the move of adult patient clinical services from Torbay Hospital to QEH Birmingham during 2012, and raise money for activity holidays for patients and their families. The team completed the 230-mile challenge in 4 days, and are well on their way to raising £10,000 (www.justgiving.com/teams/asuk).

Dr Bamiou to present Edith Whetnal Lecture at RSM
Dr Doris-Eva Bamiou has been invited (and accepted) to present the Edith Whetnall Lecture at the Royal Society of Medicine, to take place on 1st November 2012. The topic is “Managing the patient with an auditory processing disorder: the evidence, advances and future directions.”

Prof. Anne Schilder is awarded National Institute for Health Research (NIHR) professorship for ENT Health Services Research!
Eight of the UK’s most promising leaders in medical health research will be awarded a National Institute for Health Research (NIHR) professorship, the Government announced today.

Each professor will receive around £1.5m of funding to conduct research into conditions that affect millions of patients across the UK.

Prof Schilder’s project will develop the evidence base for Ear, Nose and Throat (ENT) medicine and surgery, ensuring new and current treatments in ENT are tested and evaluated so that patients can benefit from the best treatments in the field.

Find out more: 
http://www.nihr.ac.uk/faculty/Pages/ResearchProfessorships.aspx

http://mediacentre.dh.gov.uk/2012/02/15/new-research-professors-help-treatments-makeleap-from-bench-to-bedside/
Deafness Research UK’s Bionic Ear Show shortlisted for 2012 National Lottery Awards

We are delighted to announce that Deafness Research UK’s Bionic Ear Show has been shortlisted in the Best Health Project category of the 2012 National Lottery Awards.

Voting closes on 22nd July. They need as many votes as possible to get the Show through to the final stage of the competition which will be broadcast live on BBC One. The winning project will win a £2,000 cash prize as well as national recognition through the star-studded televised awards ceremony.

Please help Bionic Ear Show by voting now - you just need to click the link below. It is that simple!

http://www.lotterygoodcauses.org.uk/project/bionic-ear-show

You can vote using your email address or through your Facebook/twitter account. If you use Facebook or twitter please share this with your friends and family. Alternatively, please send your contacts an email asking them to click the link above.

It is really simple and they would very much appreciate your help - hopefully we can get the Bionic Ear Show to the final stage of this competition!

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Guess the ear

Below is a picture of one of the Ear Institute’s Principal Investigators’ ears... but whose?

If you think you know then why not email kate.faxen@ucl.ac.uk before 31st August 2012 to be entered into a surprise prize* draw (*this prize will not be substantial or life changing!) The winner will be announced in the next newsletter.

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Donate

Donations can be made to the Ear Institute from our website or via the following link:

https://www.ucl.ac.uk/online-giving/giving-to?PROJECT_CODE=18