Getting involved

Research at the UCL Ear Institute can be organised into four Research Units:

1) Cell and Molecular Biology
2) Neurophysiology and Computation
3) Human Perception and Audiology
4) Medicine and Clinical Trials

These Units are not mutually exclusive and collaborations across the teams often result in pioneering research projects which rely on participation by members of the public.

If you would like to get involved in any of our work please get in touch. Projects exist from completing a one off questionnaire to regular listening experiments, 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/participate
Jobs, courses and seminars

New Grays Inn Road short course for 2013: Introduction to Ear Care and Micro-Suctioning - 13 & 14 September 2013

Organised by: Dr Ghada Al-Malky, Dr Simon Gane & Mrs Mary Kelly

Speakers to include: Prof S Saeed, Prof H Khalil, Mr S Khalil & Mrs A Griggs

A two-day course arranged to cover theoretical knowledge on day one and practical training on day two. This is ideal for practitioners looking to widen their experience in aural care and micro-suction.

Topics covered will include:

- Anatomy of the ear & otoscopic examination
- Common pathological conditions requiring aural care
- Red flags and warning signs
- How to set up an ear care clinic
- Practical hands-on training for wax removal including micro-suction

Fee: £395

Date change: Presentation Skills for Medics will now run on 31/03/2014

Most of our courses can be booked and payed for online now via the UCL Online Store!

While this list is up-to-date at time of publication, we will be adding to this list in the near future so please do check our website for current information.

http://www.ucl.ac.uk/ear/courses/shortcourses

New starters

Katie Smith
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katie.smith@ucl.ac.uk

Katie Smith joined the Ear Institute in March 2013 to work with Dan Jagger and David McAlpine as a postdoc on an Action on Hearing Loss-funded project. This aims to characterize the electrophysiological response of spiral ganglion neurons to stimulation by cochlear implants.

Katie was formerly at the UCL Institute of Ophthalmology, when she undertook her PhD on the role of Kv2.1/Kv8.2 heteromeric ion channels in a form of inherited retinal disease. The main findings of her thesis have been published recently (Smith K.E., Wilkie S.E., Tebbs-Warner J.T., Jarvis B.J., Gallasch L., Stocker M., Hunt D.M. (2012) Functional analysis of missense mutations in Kv8.2 causing cone dystrophy with supernormal rod electroretinogram. J. Biol. Chem. 287, 43972-43983). More recently she was a member of the Physiological Systems and Disease Group at the University of Manchester, studying the potential of Kv7 ion channels as therapeutic targets in pulmonary hypertension.
Ediz Sohoglu  
e.sohoglu@ucl.ac.uk

Ed joined the Ear Institute in April as a post-doc on a BBSRC-funded project investigating auditory change detection (with Maria Chait). Prior to this, Ed completed a PhD in Cognitive Neuroscience (with Matt Davis) at the MRC Cognition and Brain Sciences Unit in Cambridge. Ed’s work at the Ear Institute will focus on how listeners detect changes in complex auditory scenes, using psychophysics and MEG.

In the media

Martin Birchall interviewed on BBC Radio Four

Prof Birchall has recently been awarded a £2.8m MRC grant to fund a project entitled “RegenVOX: phase I/II clinical trial of stem cell based tissue engineered laryngeal implants” which aims to develop and test methods of replacing the larynx, or voicebox, in people. Pre-clinical testing on pigs involved transplanting the larynx with a tissue engineered larynx and observing the results. Prof Birchall explains more on the Radio 4 In Science programme which you can hear using this link:

http://www.bbc.co.uk/programmes/b036kxv8

Featured papers

Dr Debi Vickers  
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Using personal response systems to assess speech perception within the classroom

The goal of this paper was to determine:

1. Whether personal response system (PRS) handheld voting cards, together with a closed set speech perception test (Chear Auditory Perception Test CAPT), provide an appropriate method for evaluating speech perception in the classroom.

2. Whether listening with SFA provides better access to speech than without SFA, taking into account children’s vocabulary age, middle ear dysfunction or ear canal wax, and home language.

44 children aged between 6 years 11 months to 8 years 10 months were tested in a 19th century school in central London, UK. Each child used a PRS to register their chosen response to stimuli in a shortened version of the four-alternative consonant discrimination section of the CAPT. Each child sat at their usual position in the room and stimuli were presented both in quiet and in noise. The target speech was presented from the front of the classroom at 65 dBA (calibrated at 1 meter) and the presented noise level was 46 dBA measured at the centre of the classroom.
White noise from the teacher’s right hand side of the classroom and International Speech Test Signal (ISTS) from the teacher’s left hand side were used, and the noises were matched at the centre point of the classroom (10 seconds averaging (A-weighted)). All conditions were presented twice, once with SFA and once without SFA and the order of testing was randomized. Each child’s expressive vocabulary age and middle ear status were measured individually and their home language and any special educational needs were recorded.

All children were able to use the PRS handsets and the CAPT speech perception test was sufficiently sensitive to highlight differences in perception in the different listening conditions. Scores were higher in quiet than in any noise condition. Group performance was significantly better with SFA than without it. The main demographic predictor of performance was expressive vocabulary age. SFA gave more benefit to the poorer performers. There were no significant effects on performance relating to middle ear status or home language; however the size of the population was too small to be able to fully explore these aspects in greater detail.

In conclusion we found that PRS together with the CAPT provides a sensitive measure for in situ speech perception testing within the classroom. Vocabulary age has a large impact on a child’s ability to perceive the speech signal. SFA leads to improved speech perception, when the speech signal has been degraded due to poor acoustics or background noise and has a particularly large effect for children with lower vocabulary ages.

Dr Maria Chait
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Brain picks out salient sounds from background noise by tracking frequency and time

New research carried out by Dr Maria Chait and colleagues from the Wellcome Trust Centre for Neuroimaging, UCL and the University of Maryland, reveals how our brains are able to pick out important sounds from the noisy world around us. The findings, published in the journal ‘eLife’, could lead to new diagnostic tests for hearing disorders.

Our ears can effortlessly pick out the sounds we need to hear from a noisy environment - hearing our mobile phone ringtone in the middle of the Notting Hill Carnival, for example - but how our brains process this information (the so-called ‘cocktail party problem’) has been a longstanding research question in hearing science.

Researchers have previously investigated this using simple sounds such as two tones of different pitches, but now researchers at UCL and Newcastle University have used complicated sounds that are more representative of those we hear in real life. The team used ‘machine-like beeps’ that overlap in both frequency and time to recreate a busy sound environment and obtain new insights into how the brain solves this problem.

In the study, groups of volunteers were asked to identify target sounds from within this noisy background in a series of experiments.
Sundeep Teki, a PhD student from the Wellcome Trust Centre for Neuroimaging at UCL and joint first author of the study, said: “Participants were able to detect complex target sounds from the background noise, even when the target sounds were delivered at a faster rate or there was a loud disruptive noise between them.”

Dr Maria Chait, a senior lecturer at UCL Ear Institute and joint first author on the study, adds: “Previous models based on simple tones suggest that people differentiate sounds based on differences in frequency, or pitch. Our findings show that time is also an important factor, with sounds grouped as belonging to one object by virtue of being correlated in time.”

Professor Tim Griffiths, Professor of Cognitive Neurology at Newcastle University and lead researcher on the study, said: “Many hearing disorders are characterised by the loss of ability to detect speech in noisy environments. Disorders like this that are caused by problems with how the brain interprets sound information, rather than physical damage to the ear and hearing machinery, remain poorly understood.

“These findings inform us about a fundamental brain mechanism for detecting sound patterns and identifies a process that can go wrong in hearing disorders. We now have an opportunity to create better tests for these types of hearing problems.”

The research was funded by the Wellcome Trust and Deafness Research UK.


More recent publications

Hearing Research Annual Reviews 2013

Dr Dan Jagger & Professor Andy Forge have recently published a review article on the physiological and pathophysiological roles of root cells in the cochlea. Their article also contributed the front cover image.


Research updates

Anahita Mehta (Dr Ifat Yasin)
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How the brain processes interrupted sounds

We are constantly surrounded by sounds emanating from a variety of sources, and our auditory system is able to “tease-apart” this information making it easier, for example, to follow one person’s conversation in a room full of people conversing. The auditory brain may use a number of ways in which to achieve this. The brain may “group together” aspects of sounds that are similar and assume they belong to the same sound source, and by shifting our attention we can further influence this grouping process.

A study was conducted to study how listeners interpret patterns of sounds that follow one another with short silent pauses, and listeners’ ability to detect an occasional larger-than-usual pause between the sounds. Listeners were requested to attend to some sounds and not others as the sounds were being played, and to press a response pad to indicate what sound pattern they heard. At the same time the brain’s response to these sounds was recorded from sensors placed around the scalp which pick up bioelectric signals generated by the brain. Results showed that a larger-than-usual pause in sounds changes the type of sound pattern heard and that this result is further influenced by shifting attention. Small changes in sound pattern may be picked up by the brain even before we are fully aware of the change.

Anahita Mehta has been awarded the UCL Bogue Fellowship to visit the University of Maryland, USA, for a 3-month period to investigate the effects of attention on the processing of both auditory and visual information.


Vit Drga (Dr Ifat yasin & Prof C Plack)
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How neural feedback from the brain affects amplification in the inner ear

Hearing in noise is a common problem, even more so for someone with a hearing loss. Researchers at the Ear Institute are involved in a study funded by the EPSRC to understand how neural information from the brainstem provides feedback to change the way we process sounds in the inner ear, which helps us hear sounds of interest in background noise. Computer-based, game-like tasks are used with listeners, who hear a series of sounds through headphones and have to find a subtle signal of interest. By changing the frequency, level, and timing of sounds, we can work out key aspects of cochlea processing using human performance in behavioural tasks. The results of such a study have shown that when interfering sounds are relatively loud and closer in time to a sound of interest, neural feedback from the brainstem modifies the response to those interfering sounds within the cochlea in the inner ear. In fact, it appears that this feedback can turn down the amplification of sounds in
the inner ear which may make it easier to detect other sounds in background noise. This research was awarded the prize for best poster in the basic research category (poster title: Effect of efferent activation on cochlear gain and compression) at the British Society of Audiology meeting (2012).

The novel behavioural technique used for such measurements has recently been published, and there are further studies underway investigating how the time-duration and sound frequency of interfering sounds affects the reduction of amplification in the inner ear.

Aneeka Degun (EvidENT)
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OpenENT
In April 2013 the UCL evidENT team on behalf of the Ear Institute and RNTNEH initiated the OpenENT project.

OpenENT aims to develop a framework for electronic health records, capturing clinical information uniformly across ENT, hearing and balance specialties, enabling end users to access this information for audit and research projects.

Phase one of the project (led by Aneeka Degun) found there is widespread agreement and engagement from end users to develop OpenENT and that patient input is critical in this process. It also found that no single existing hospital database has the capacity or the flexibility to fulfil end users’ requirements. Other technologies and databases were well researched and Open Source software solutions were established to be the preferred technology to develop OpenENT.

The evidENT team in collaboration with CHAPTER were awarded funds by UCL Grand Challenge. Over the next few months evidENT will be establishing further funding to support phase two of OpenENT and are responding to the NHS England call to Safer Hospitals/Wards Technology Grant.

Phase two aims to:

- Engage with patients and the public to gather their requirements for OpenENT
- Further engage RNTNEH and UCL end users to inform design and content
- Link existing hospital systems and create clinical templates with end users
- Use Open Source software solutions to develop a pilot version of OpenENT
- Test the pilot database within a RNTNEH department that is currently paper-based

If you would like more information or have any ideas please contact Aneeka Degun.
**Student updates**

**Student Prizes 2013**

The BSc and MSc prizes for performance, projects and posters were presented to students at an afternoon ceremony at the Ear Institute on 5th June.

We’re really grateful to all of our industry sponsors who paid for the prizes!

**BSc Audiology**

- Neurelec Prize for Academic Excellence (Yr1) - **David Perry**
- InHealth Prize for Academic Excellence (Yr1) - **Trisha Halaiy**
- Interacoustics Prize for Academic Excellence (Yr2) - **Rebecca Lee**
- Biosense Prize for Practical Clinical Excellence (Yr2) - **Nasreen Hussain**
- Your World Prize for Best Portfolio (Yr3) - **Tanjina Ferdous**
- Oticon Prize for Clinical Excellence (Yr3) - **Amy Jauncey**
- Mediplacements Prize for Academic Excellence (Yr4) - **Hannah Williams**
- GNResound Prize for Best Project (Yr4) - **Darshan Naik**
- Ear Institute Prize for Audiological Advocacy - **Katherine Green**
- Ear Institute Prize for Audiological Advocacy - **Zahra Chaudhry**

**Poster awards**

- Advanced Bionics Prize for 1st Place - **Manisha Gossain**
- Advanced Bionics Prize for 2nd Place - **Nkita Patel**
- Advanced Bionics Prize for 3rd Place - **Naomi Ebert**

**MSc Audiological Science**

- Cochlear Prize for Best Project - **Joza Aldabaan**
- Siemens Prize for Best Poster - **Michelle Chung**
- Otodynamics Prize for Best Overall Performance (Full-time student) - **Nada Alotaishan**
- Ear Institute Prize for Best Overall Performance (Part-time Student) - **Melanie Miller**
- MED-EL Prize for Clinical Excellence - **Mandeep Dubb**
- Harley Street Hearing Prize for Best Clinical Portfolio (Peggy Chalmers Award) - **Eleanor Darby**

**MSc Advanced Audiology**

- Phonak Prize for Best Academic Performance - **Jocelyn Wright**
- Phonak Prize for Audiological Advocacy - **Carolina Leal**

**MSc Audio Vestibular Medicine**

- Guymark First Prize for Academic Excellence - **Juliet Meldrum**
- Pindrop Hearing Second Prize for Academic Excellence - **Astrid Jorgensen**

**Certificate for Clinical Competency**

- PCWerth Prize for Best Practical Marks & Portfolio - **Nora MacDonald**
First Graduation Ceremony for MSc Advanced Audiology

Warm congratulations to our first ever graduates of the MSc in Advanced Audiology! The graduation ceremony took place at the Royal Festival Hall on London’s Southbank and it was wonderful to celebrate the success of our students along with their friends and family members. Well done to Carolina Leal, Andria Kyamidou, Jagjit Singh, Arooj Majeed and Jocelyn Wright. These impressive ladies are changing the world of hearing healthcare one fabulous UCL audiologist at a time, and it is noteworthy to mention that 2 students graduated with distinction, while a further 2 received merit! This is such a great achievement and we are incredibly proud of them.

The course had its first intake of students during 2009/10 academic year and has been growing ever since. Aimed at practicing clinicians, the course is an opportunity to brush up on clinical knowledge that will ultimately translate into enhanced patient care and offer audiologists a chance to further their clinical careers.

MSc Advanced Audiology
Jagjit K Berdewa Singh
Andria Kyamidou
Carolina F Leal
Arooj A Majeed
Jocelyn A Wright

Elective Student placement with Prof Birchall

Adil Jaulim is a medical student at Barts and The London School of Medicine who elected to undertake a 5 week ENT placement at the RNTNEH with Prof Birchall and his team. During that time, he attended clinic and theatre sessions as an observer as well as attending a surgical skills course.

Adil reflects that his five week taster in ENT was a humbling experience for him, having been been moved by patients’ dedication to overcome disease and disability and finding admiration for the medical and non-medical staff who care for patients at RNTNEH.

He learnt a significant amount regarding the day to day work of an ENT surgeon as well as witnessing first hand pioneering surgical procedures being implemented.

On a professional level, Adil found the teams he worked with to be truly inspirational and welcoming. He left feeling more confident in examining patients with ENT conditions as well as using instruments in the outpatient department and has improved his surgical skills.

Adil would recommend an elective in ENT to any student, saying that:

“The surgical variety is, in my opinion, unparalleled.”
PhD/MDRes updates

Congratulations to Drs Nicole Stanley, Greg Ball and Shaza Salah and who were awarded their PhD in 2012/13. We wish them all well in their new endeavours.

Over the course of the last few months, 6 students upgraded from MPhil to PhD (Nicolas Barascud, Lorcan Browne, Peggy Lange, Marina Mat Baki, Anahita Mehta and Katherine Wood), with several students expected to upgrade in the next quarter.

We would also like to welcome new students Natalie Bohm and Fitim Fetahu.

Featured profiles

Lorcan Browne
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Lorcan Browne has successfully upgraded from MPhil to PhD. Lorcan holds a UCL Crucible Studentship, and is investigating the regulation of spiral ganglion neuron excitability in a project co-supervised by Dan Jagger and David McAlpine at the Ear Institute, and by David Selwood at the Wolfson Institute for Biomedical Research (WIBR).

Lorcan previously undertook an MSc in Drug Design at UCL, and a BA in Medicinal Chemistry at Trinity College Dublin.

Nicolas Barascud
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Nicolas Barascud has successfully upgraded from MPhil to PhD. Nicolas is using behavioural and neuroimaging methods to study the role of temporal regularities in auditory scenes, and how those are processed in the human brain. His project is supervised by Maria Chait at the Ear Institute, and by Sophie Scott at the Institute of Cognitive Neuroscience (ICN) at UCL.

Nicolas joined the UCL Ear Institute as a PhD student in 2011. He holds an MSc in Acoustics and Signal Processing (IRCAM, Paris), an MSc in Cognitive Neuroscience (Université Pierre et Marie Curie, Paris), and a Magistère in Theoretical Physics (Université Paris Sud 11, Orsay).
Other News

Welcoming Sound Seekers

Sound Seekers is a small charity providing audiological support to sub-Saharan Africa. We are already working with Dr Priya Singh and Dr Cherilee Rutherford on a distance learning project with the University of Nairobi, but we’d love to connect with Ear Institute staff and students better. We are particularly interested in seeing if any audiologists would like to volunteer in any of our project countries for two weeks or more.

We know that being able to hear and talk is at the heart of love and life. Communicating, working, and being independent. Africans with hearing loss, probably can’t get a job unless it’s menial, like breaking stones or digging the fields in burning heat. Children either can’t go to school, or if they do, their teachers think they’re stupid and naughty and put them in a class with children much younger than them. Poor hearing is much more common in Africa than the UK, as it is frequently caused by factors that have been removed from our lives, such as malaria, meningitis, poor treatment of pregnant women, untreated ear infections, wax build-up and being given cheap medicines that solve a bigger health problem but damage hearing. Add to this that a total absence of audiology services, and no one to help you care for your ears to prevent damage in the first place – this is what most of Africa is like.

But we can make a huge difference by doing the right things and spending wisely. We train African people in seven sub-Saharan countries to be able to offer basic audiology services and help them reach a wide range of children.

We give them the equipment they need and we send wonderful kind volunteer audiologists to project countries to work shoulder to shoulder with them. We are also bringing new hearing technology to Malawi and Zambia, to enable virtual working with audiologists in South Africa, the UK and America – and running a screening programme for children in Sierra Leone.

We’d love your help. Would you like to work shoulder-to-shoulder with a nurse in Africa, helping to improve her audiological skills? You might encounter exciting situations that wouldn’t happen in London – like removing a gigantic insect from inside someone’s ear, or managing a day clinic in the shade of a mango tree with no running water. Or would you like to help in another way, like fundraising? We’d really love to hear from you, even if you just want to pop in for a cup of tea to say hello. We can cater for most hot drink preferences, and we’d love to meet you – the office is just where David McAlpine and his team sit.
Grants awarded

Congratulations to all of our researchers who have been awarded grants. In addition to Prof Birchall’s £2.8 Million MRC grant to fund the “RegenVOX: phase I/II clinical trial of stem cell based tissue engineered laryngeal implants” project, The Ear Institute has also been awarded:

- Dr Ruth Taylor has received £253,790 from Cochlear Research and Development Limited to investigate “Preservation of residual hearing, Part II”

- Dr Jennifer Bizley has received £1,183,140 from Wellcome Trust for her project “Listening in a noisy world: the role of visual activity in auditory cortex for sound perception”

Careers morning

The EI will be hosting a careers morning on 30th September which we hope all PhD students and post-docs will attend. We’ll be focusing on things like how to make good post-doc applications, fellowship opportunities and how to juggle family life and an academic career.

Ear Institute family day

The EI are arranging a family day on the first weekend in September, for a picnic and family-friendly sporting activities! Find out more from Maria Chait.

Guess the ear

Congratulations to the winner of last issue’s prize of a box of chocolates; Sarah Allison from the UCL Ear Institute correctly guessed that it was Dr Sally Dawson’s ear pictured! It’s on it’s way!

Below is a picture of another 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 1st October 2013 to be entered into a prize draw. The winner will be announced in the next newsletter.

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

Or make donations specifically for microtia research at the Ear Institute via this link:

https://www.ucl.ac.uk/online-giving/giving-to?PROJECT_CODE=23

Submissions

If you would like to submit something for the next newsletter please email:

- kate.faxen@ucl.ac.uk
- d.vickers@ucl.ac.uk

by 1st October 2013 please.