UNIVERSITY OF LEICESTER

BIOCHEMICAL SOCIETY

## Biochemical Society Outreach Grant Report

# "Getting to Know Your Brain"

Brain Awareness Day

Wednesday 14th March, 2018.

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## Background

**"Getting to Know Your Brain" was held at the University of Leicester on Wednesday 14th March, and was hosted by the Department of Neuroscience, Psychology & Behaviour. Linked to the Dana Foundation, International Brain Awareness Week (12 to 18 March, 2018), the event formed part of a worldwide campaign to increase awareness of brain research. Two sessions were held in the George Davis Centre for Medicine, each comprising short talks, followed by demonstrations and posters with accompanying refreshments. The afternoon session was aimed at key stage 4 and 5 school students, while the evening session was aimed at the general public.**

*The afternoon audience*

## Afternoon with School Students

The afternoon started with a talk from Prof. Rodrigo Quian-Quiroga, in which he explained how the brain perceives the environment, how it learns and how memories are stored. This was followed by Dr. Claire Gibson who spoke about traumatic brain injury and stroke, giving insights into how research is providing a better prognosis for people who suffer brain damage. Finally, Dr. Andrew Young spoke about schizophrenia, and how modelling the disease in animals is helping us understand the mechanisms underlying the disease, and develop potential new treatments. The talks were followed by a less formal time, accompanied by refreshments, during which the guests could take part in the demonstrations, visit posters put on mainly by post-graduate and under-graduate students, and talk to the scientists.

*Learning and memory*

*Schizophrenia*

## Evening with the General Public

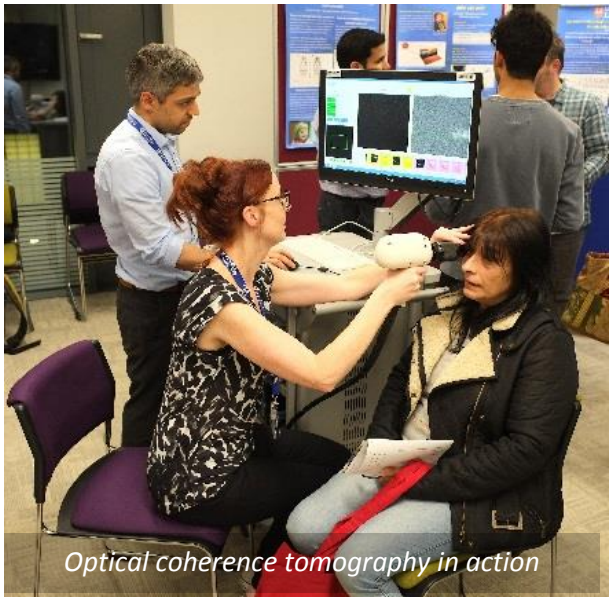

*Eye tracking and reading*

The evening session began with Dr. Sarah White who showed how tracking eye movement can tell us about cognitive mechanisms involved in reading, including in languages which involve different types of script, and how this can help people who experience difficulty in reading. This was followed by Prof. Flaviano Giorgini who gave a fascinating insight into how genetic studies in yeast and fruit flies can help us understand the degenerative processes in diseases like Parkinson's disease and Huntington's disease. As in the afternoon, this was followed by the demonstrations and posters, and opportunity to "Meet the Brain Scientist" and discuss their research, and indeed many other aspects of brain function, over cheese and wine. Lively discussion between the visitors and the presenters eventually had to be curtailed 30 minutes after the event was due to finish, in order to allow the rooms to be cleared ready for the next day's teaching.


*The evening audience*

## Demonstrations

A variety of demonstrations ran during both the afternoon and evening sessions, exploring many aspects of brain activity from psychological manipulations to cellular mechanisms, where visitors could learn about organisation and functioning of the brain and experience for themselves phenomena related to brain function. The "**Ophthalmology**" demonstration enabled visitors to look at their own retina using optical coherence tomography, a technique in which light is used to probe the structure


*Optical coherence tomography in action*


*Tricking the brain*

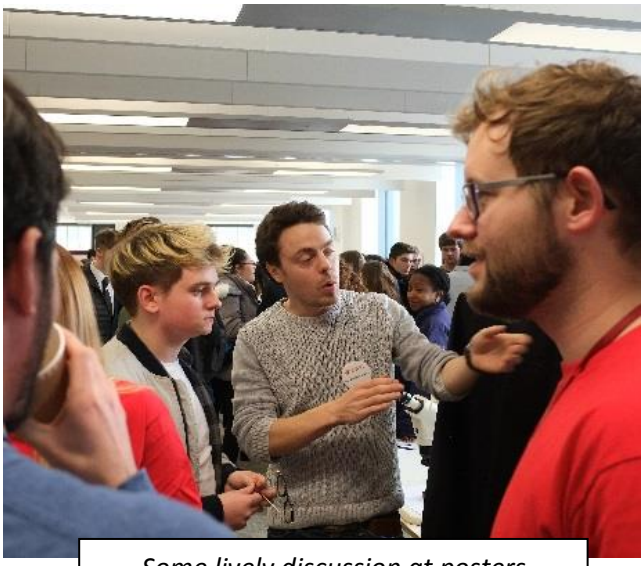

*The molecular basis of taste*

of the retina, helping us understand and diagnose many retinal abnormalities affecting vision. In "**Tricking the brain**" visitors took part in a variety of different psychology experiments testing vision and attention and learned the science behind how the brain can be misled using optical and cognitive illusions – things are not always as they seem! "**The Molecular basis of taste perception**" looked to see whether people were 'super tasters' or not: being a super taster means that you are more sensitive to bitter taste. This is due to the type of bitter receptors on your tongue, which is genetically determined. As such, this simple experiment is a way of explaining both how the taste system works and how it is affected by genetics.

The focus of "**Brain structure and function**" was to show visitors how different brain areas perform different functions, with the aid of a number of model brains. By taking the models apart (and putting them back together!) they gained an appreciation of how different brain structures, controlling specific behaviours, are organised within the whole brain. Electrical signalling in nerve cells is critical to transmission of information, and "**Seeing the signals which control muscle action**" gave visitors the opportunity to visualise the electrical signals in their arm muscles when they lifted objects. Complementing this, "**Seeing neurones**" demonstrated how fluorescent markers enable us to see neurones in developing zebrafish. Visitors were able to see the neurones in live 1 day old fish under a microscope, and find out how these techniques can help us understand human neurodevelopment.


*Brain structure and function*


*Seeing the signals which control muscles*



*Some lively discussion at posters*

## Posters

In addition there were around 30 posters presented mainly by postgraduate and undergraduate students outlining their current research in psychology, neurophysiology, neurochemistry and behaviour. These included posters on neural plasticity in the cochlear nucleus and how loud noise modulates activity in the brain; measuring behaviour in *Planarian* worms; eye movements controlling vision and reading; behavioural tests for modelling deficits following strokes in animals; the role of sex in stroke susceptibility; testing neurochemicals which may protect against stroke; measuring gene expression in the brain; measuring chemical changes which occur in schizophrenia and in addiction.

## "Meet the Scientists"

A feature of the day's events was encouraging visitors to talk to the presenters and discuss their research and brain function generally. To this end, all presenters, (staff, postgraduate students, undergraduate students) were identified by "Meet the Brain Scientist" badges. In both sessions, the visitors took full advantage of this, and a great deal of enthusiastic discussion ensued.


## Evaluation

The primary aim of the event was to inform visitors of how research (both generally and specifically at Leicester) is shaping our understanding of how the brain works at many different levels, and how this understanding is helping us develop new treatments for diseases involving brain dysfunction. However, a secondary aim was

to give early career scientists the opportunity to take part in outreach and develop their skills in presenting to non-specialist audiences. To this end, undergraduate students, postgraduate students and early career post-doctoral researchers took part by presenting posters and/or helping with the demonstrations, and were mentored by senior staff, experienced in outreach activity. Post graduate students were also part of the event organising committee, and played a prominent role in setting up and arranging activities on the day itself.


During the afternoon, a total of 199 school students, plus accompanying staff, attended representing 15 different schools from the local area and further afield (including East London, Cheltenham, Bracknell, Birmingham, Sleaford). Twitter feeds on the day showed visitors engaging in the activities and enjoying the event. According to Feedback, the main reasons for attending were an interest in neuroscience, psychology and/or medicine, and to learn more about studying at University. The majority of people found the event interesting (83% strongly agreed) and said it increased their understanding of brain research (80% strongly agreed). In addition, the majority found the talks (86% strongly agreed) and the demonstrations (60% strongly agreed) interesting and informative. Some comments from the afternoon session included; “Very engaging and well-pitched”; “Worthwhile, learned a lot”: Really interesting”.

In the evening a total of 147 people attended, ranging in age from early teens to octogenarians. The reasons for attending included a general interest in science, a specific interest in brains and neuroscience and a desire to find out more about specific conditions (e.g. Alzheimer’s and Parkinson’s diseases). Feedback from the evening session showed that the majority of people found the event interesting (97% strongly agreed) and said it increased their understanding of brain research (97% strongly agreed): the majority found the talks interesting (91% strongly agreed) and all (100% strongly agreed) found the demonstrations informative. Some specific comments from the evening session were “Superb”; “Knowledgeable students and teachers”; “Very informative and engaging demonstrations”; “Clear, interesting facts, approachable presenters”; “They were very good at pitching it to the right level for us (not too highly academic)”; Wide range, accessible, very informative”; “Enjoyed it beyond expectation”; “Keep up the good work!”.