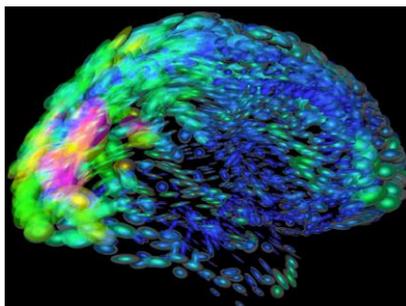


## BSc. Neuroscience

*Degree outlet from Biological and Chemical Sciences (CK402)*



*“There is no scientific study more vital to man than the study of his own brain. Our entire view of the universe depends on it.”*

- Francis Crick (co-discoverer of DNA)

Dr. Yvonne Nolan  
Programme Director of BSc Neuroscience

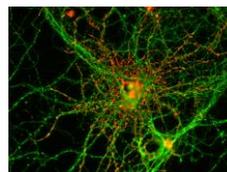
## *What is Neuroscience?*

Neuroscience is the study of the **nervous system**:  
brain, spinal cord and all the nerves of the body

We study it from the molecular (DNA/genes)....



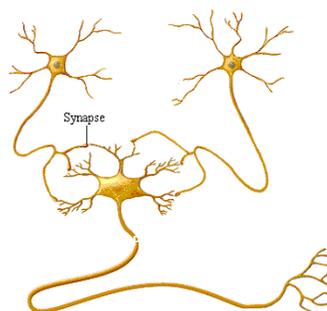
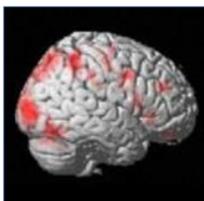
.....to the cellular  
(e.g. neuron)



..... to the behavioural level  
(e.g. thought, memory, emotion)

## Brain Facts!

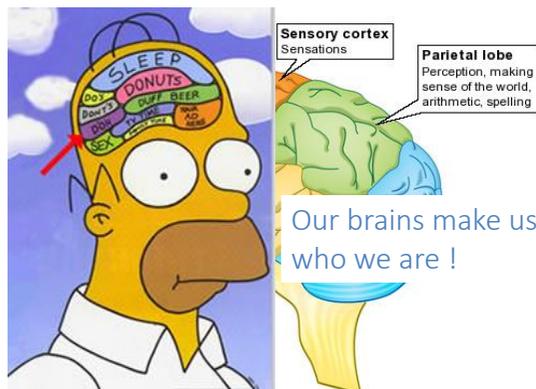
- The brain weighs around 1.5kg
- We each have up of 100 billion neurons in our brain
- Neurons make 100 trillion connections with other neurons (synapses)
- “Circuits” (pathways) of neurons work together to control our behaviour



## What is Neuroscience?



MRI of a healthy brain



The nervous system is an astonishingly complex system.

It controls everything we do e.g. movement, emotions, sleep, appetite, memory, vision, hearing, thoughts, intelligence.

## Why study Neuroscience?

Current knowledge is only the “tip of the iceberg”.

For example, we do not fully understand the biological basis of:

- vision
- motivation
- emotion
- decision-making
- perception
- memory



## Why study Neuroscience?



How does our brain create the feelings of love, joy, anger, fear and disappointment?

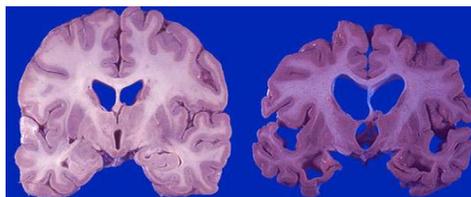


## Why study Neuroscience?

What happens when neurons die, are damaged or don't function properly?

We study neurodegenerative diseases, which are caused by the death of nerve cells e.g.:

- Alzheimer's disease
- Parkinson's disease
- multiple sclerosis
- motor neurone disease



Normal Brain

Alzheimer's Brain



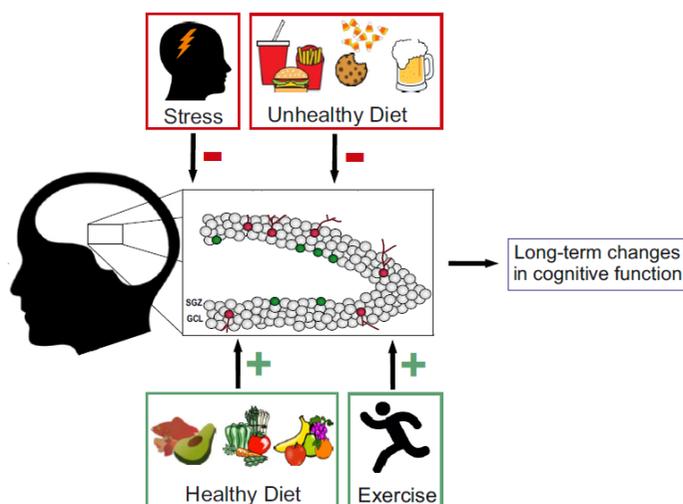
At Eternity's Gate, Vincent van Gogh

We study psychiatric disorders, which affect behaviour and personality e.g.:

- Schizophrenia
- Depression
- Addiction

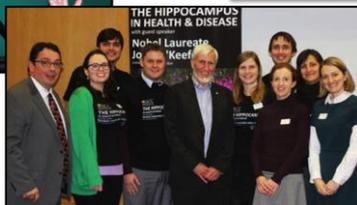
## Why study Neuroscience?

How does the environment affect brain function?



## Why study Neuroscience?

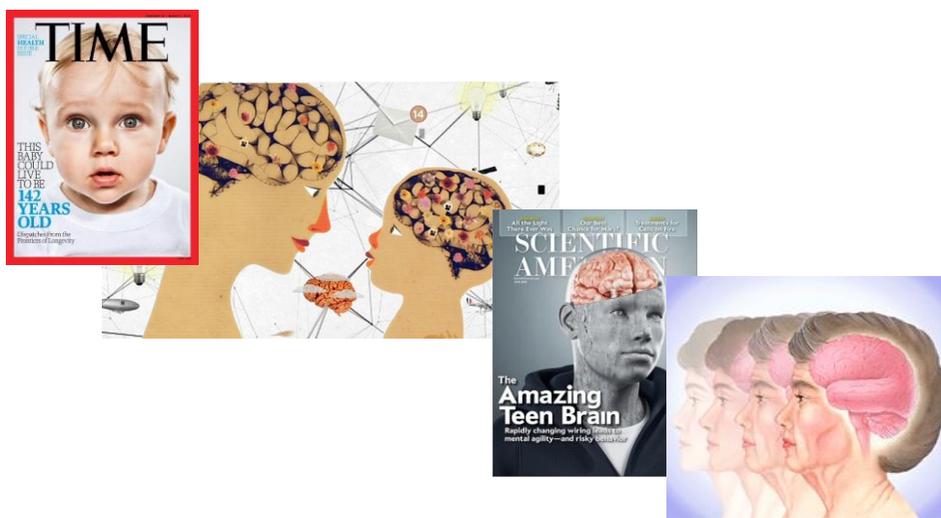
How do we learn and remember?



In 2014 John O'Keefe won the Nobel Prize in Physiology or Medicine for the discovery of specialized brain networks for memory.

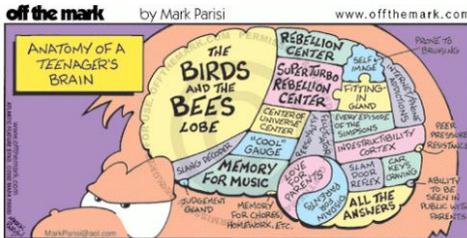


We study the development of the brain, from the embryo, throughout childhood, adolescence, adulthood, and aging.



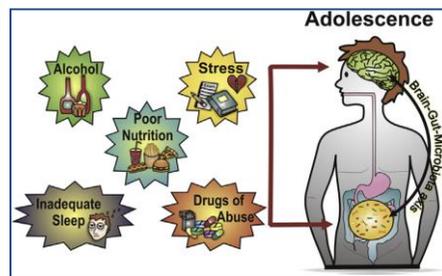
## The Teenage Brain: Work in Progress

The 'reward centre' of the brain is still being fine-tuned during adolescence, and thus makes the teenage brain more vulnerable to drugs, alcohol, gambling, risk-taking.



© Mark Parisi. Permission required for use.

TEEN-AGE MOUSE



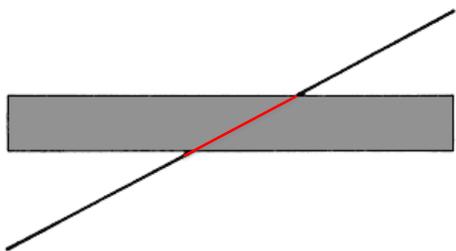
Our brain allows us to make sense of vast amounts of constantly-changing information to which we are exposed every day.

But sometimes our brain tricks us.....!



Can you see an old hooded woman ?  
Or a shy young lady ?

Will the black diagonal lines join up ?



Can you see a musician?

Or a girl's face??

## *BSc. Neuroscience - Location*



*Western Gateway Building, UCC*



*Biosciences Institute, UCC*



- Flagship degree program of the Dept. of Anatomy & Neuroscience
- Established in 1998; first BSc in Neuroscience in Ireland
- Controlled student numbers
- Teaching by research-active lecturers

## Academic staff



**Prof. John Cryan**  
Chair of Anatomy



**Prof. Aideen Sullivan**  
Associate Professor



**Dr. Yvonne Nolan**  
Senior Lecturer  
Director of BSc Neuroscience



**Dr. Gerard O'Keeffe**  
Senior Lecturer



**Dr. Andre Toulouse,**  
College Lecturer



**Dr. Siobhain O'Mahony**  
College Lecturer  
Third year co-ordinator of BSc Neuroscience



**Dr. Kathy Quane**  
College Lecturer



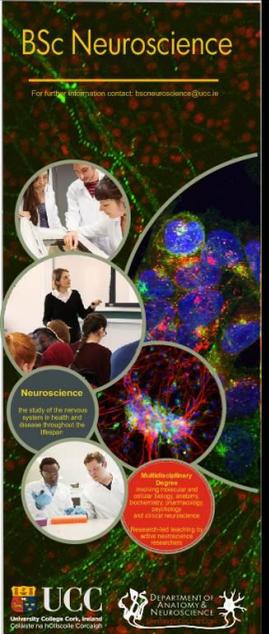
**Dr. Olivia O'Leary**  
College Lecturer



**Dr. Harriet Schellekens**  
College Lecturer



## BSc Neuroscience students





**Class of 2017**



## Entry to the BSc. Neuroscience

Enter UCC to course code CK402

1st Science : common year

1<sup>st</sup> Science subjects - Biology, Chemistry, Maths, Physics

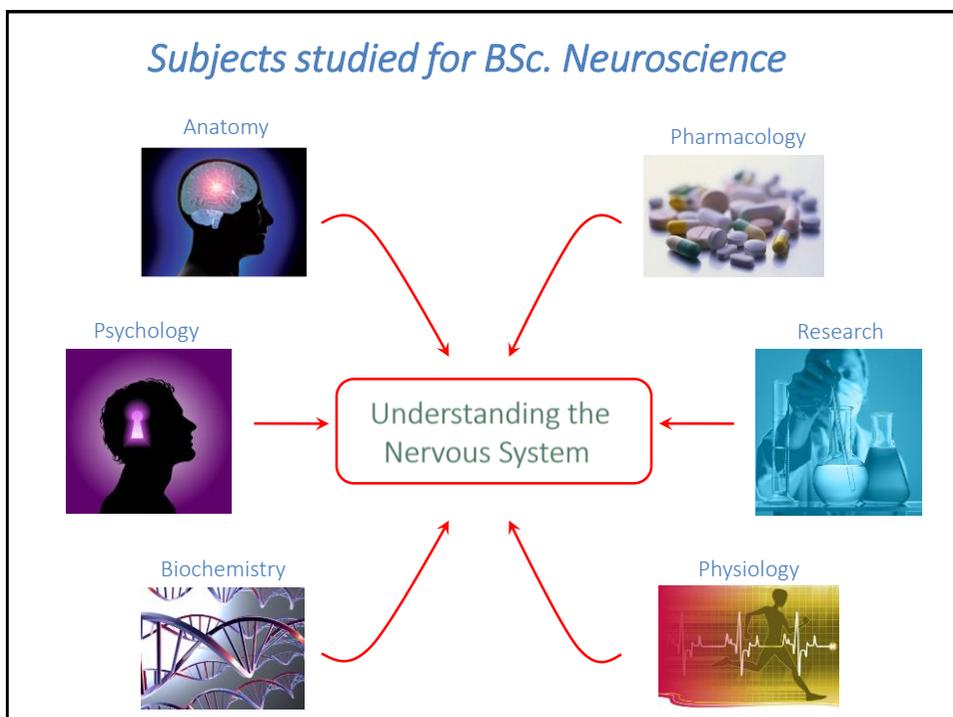
2nd Science : common year for entry to either:

Neuroscience Physiology Biochemistry Microbiology Biotechnology

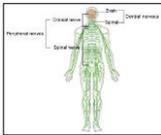
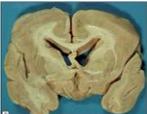
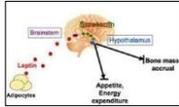
2nd Science subjects- Neuroscience, Physiology, Biochemistry  
Molecular biology, Microbiology, Statistics

Choose Neuroscience degree outlet at end of 2nd Science

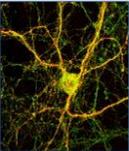
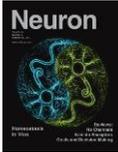
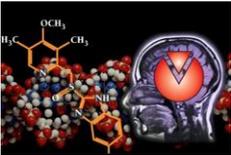
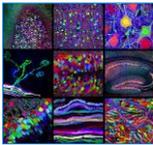
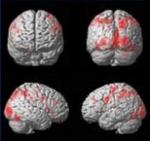
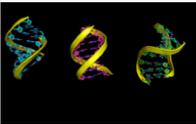
## Subjects studied for BSc. Neuroscience



### 3rd Neuroscience modules

<p>Human Nervous System</p> 	 <p>Neurobiology of Disease</p>	<p>Human Embryology &amp; Developmental Biology</p> 	
<p>Neurobiology of Regulatory Systems</p> 	 <p>Biochemistry</p>		
<p>Human Regional Neuroanatomy</p> 	 <p>Psychology</p>	<p>Library project</p> 	
<p>Pharmacology</p> 	 <p>Research Methodology in Neuroscience</p>		

### 4th Neuroscience modules

<p>Laboratory Research project</p> 	 <p>Behavioural and Cognitive Neuroscience</p>		
<p>Advanced Research Methodology in Neuroscience</p> 	 <p>Advanced Topics in Neuroscience</p>		
<p>Neuropharmacology</p> 	 <p>Developmental Neurobiology</p>		
<p>Medical Imaging and Biomedical Devices in Neuroscience</p> 	 <p>Biochemistry of Brain Disorders</p>		

## *So I have a BSc. in Neuroscience .....now what?*

- Stay In University – MSc and/or PhD
- Research – University, hospital, industry
- Medicine – Ideal entry point to Graduate-Entry Medicine
- Allied Health profession – Physiotherapy, Radiotherapy, Speech therapy, Occupational therapy, Radiography etc
- Teaching – School, Institutes of Technology, University
- Pharmaceutical / Biomedical / Biotechnology Industry
  - Sales & marketing
  - Clinical Trials
  - Research
- Scientific journalism and publishing, websites, blogs etc

### Further education:

Sample of Postgraduate Courses & Colleges Attended	
BSc (Podiatry)	University Abroad
Graduate Entry Medicine	University College Cork
Higher Diploma in Primary Education	Other Irish Institutions
MSc (Biomedical Sciences)	University Abroad
MSc (Psychiatry)	University Abroad
MSc (Regenerative Medicine)	National University of Ireland Galway
MSc (Regenerative Medicine)	University Abroad
MSc in Applied Science (Biotechnology)	University College Cork
PhD	National University of Ireland Galway

2011

Sample of Postgraduate Courses & Colleges Attended	
Higher Diploma in Applied Sciences	National University of Ireland Galway
Honours Bachelor Degree in Medicine	University College Cork
Masters in Applied Science	National University of Ireland Galway
Masters in Neuropharmacology	National University of Ireland Galway
Masters in Psychology	University Abroad
MSc (Molecular Cell Biology and Bioinnovation)	University College Cork
MSc in Applied Science (Biotechnology)	University College Cork

2012

Sample of Postgraduate Courses & Colleges Attended	
Graduate Entry Medicine	University of Limerick
Higher Diploma in Applied Computing Technology	University College Cork
MA Sport and Exercise Psychology	University of Ulster
Medicine and Bio-medical Science	National University of Ireland Galway
MSc (Bioinformatics and Computational Biology)	University College Cork
MSc (Biotechnology)	University College Cork
MSc Neuroscience	University Abroad
MSc Radiotherapy and Oncology	University Abroad
Postgraduate Diploma in Medicine	University of Limerick

2013

Sample of Postgraduate Courses & College Attended	
Graduate Entry Medicine	University College Cork
MSc Immunology and Global Health	Other Irish Institutions
MSc Regenerative Medicine	National University of Ireland Galway
MSc Stem Cell Research	Other Irish Institutions
MSc	University College Cork
MSc Molecular Cell Biology and Bioinnovation	University College Cork
MSc Speech and Language Therapy	University of Limerick

2014

First destination survey of BSc Neuroscience graduates ([www.ucc.ie/careers](http://www.ucc.ie/careers))

## Useful Neuroscience Websites

- [www.ucc.ie/en/anatomy/studyneuroscience](http://www.ucc.ie/en/anatomy/studyneuroscience)



- [www.neuroscienceireland.org](http://www.neuroscienceireland.org)



- [www.bna.org](http://www.bna.org)  
(British Neuroscience Association)



- [www.ibro.info](http://www.ibro.info)  
(International Brain Research Organisation)



- [www.sfn.org](http://www.sfn.org)  
(Society for Neuroscience)



## BSc. Neuroscience – Further Information

<http://www.ucc.ie/en/anatomy/studyneuroscience/>

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Biosciences Imaging Centre  
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**Study Neuroscience at UCC**

**BSc Neuroscience**

**Postgraduate Neuroscience**

**Graduate Testimonials**

**Contact us**

For more information contact  
**Dr Yvonne Nolan**  
Neuroscience Course Co-ordinator  
Department of Anatomy & Neuroscience  
Room 4 117 Western Gateway Building  
Western Road  
Cork  
Tel: +353 21 420 5476  
Email: [y.nolan@ucc.ie](mailto:y.nolan@ucc.ie)

**Contact Neuroscience Co-ordinator**

**Current Students**

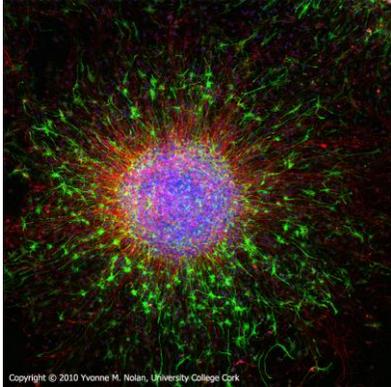
**Recent Graduates**

**Recent publications from our BSc graduates**

**Useful Links**

“Brain science will be to the 21st century what quantum physics and DNA molecular biology were to the 20th century”

William Newsome, Stanford Medical School



Contact details:

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University College Cork.

Email: [bscneuroscience@ucc.ie](mailto:bscneuroscience@ucc.ie)

<http://www.ucc.ie/en/anatomy/studyneuroscience/>