

# Studying Biological Sciences at the University of Worcester

Biology   Human Biology   Animal Biology   Biochemistry   Human Nutrition  
Forensics and Applied Biology   Biomedical Science   Medical Sciences  
Foundation Year in Biological Sciences

**Dr Mike Wheeler**  
**Principal Lecturer, Learning & Teaching Co-ordinator**  
School of Science and the Environment



**Biological Sciences courses**  
are offered by many universities



**so why choose Worcester?**



We have nationally and internationally recognised areas of research strength but...

...teaching is *the* most important thing we do



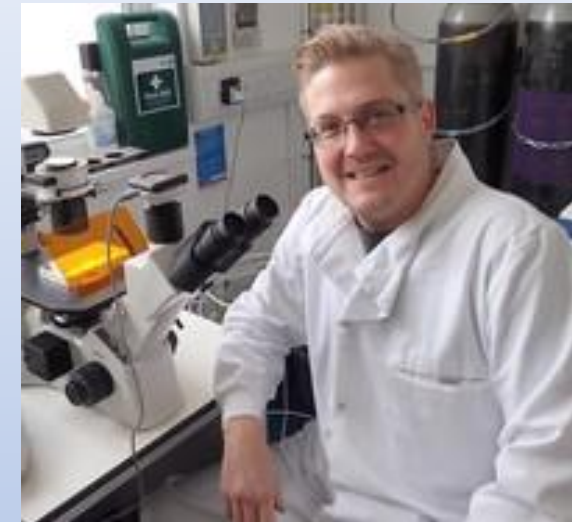
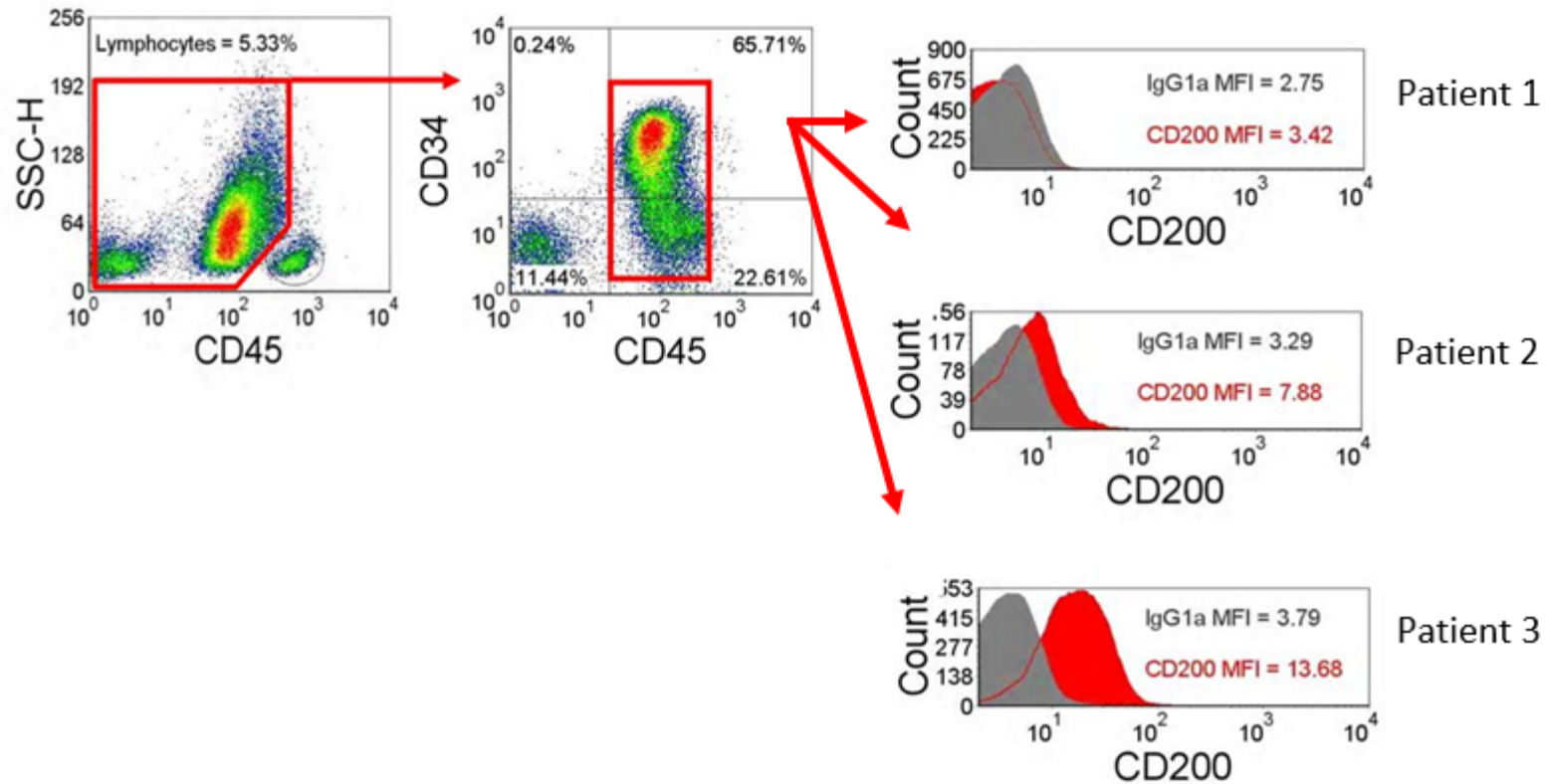
# Research *is* very important...

- taught by knowledgeable, enthusiastic staff who are experts in their field
- insights into the latest research issues and techniques
- opportunities to assist with research
- links with other universities and organisations



# Research at the University of Worcester

## Acute Myeloid Leukaemia



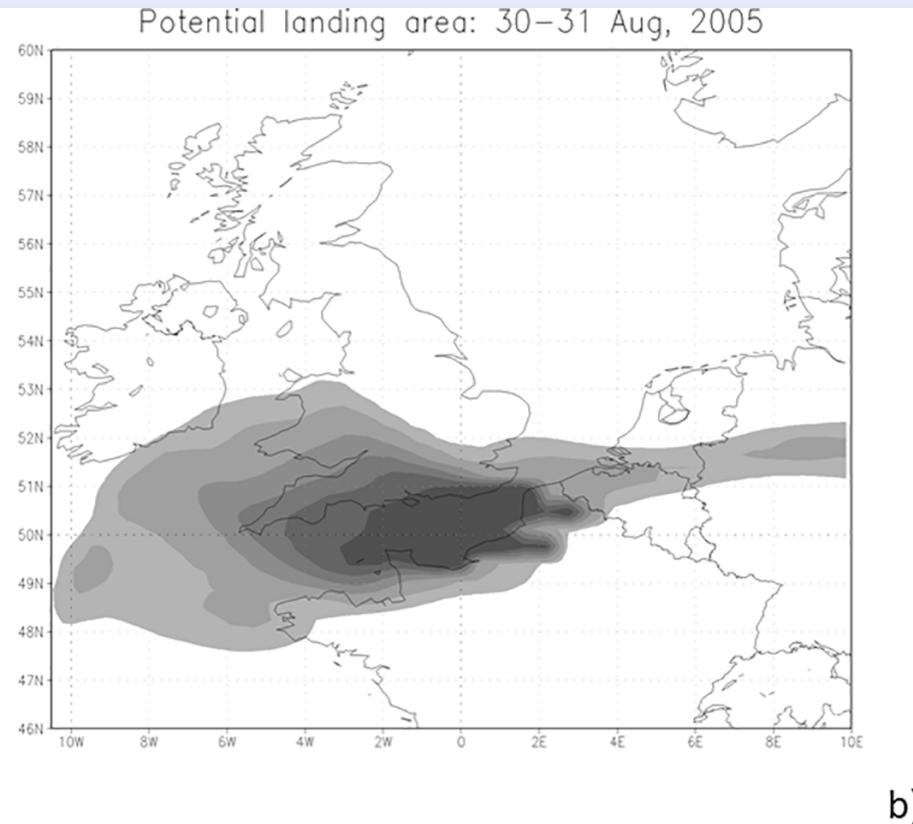
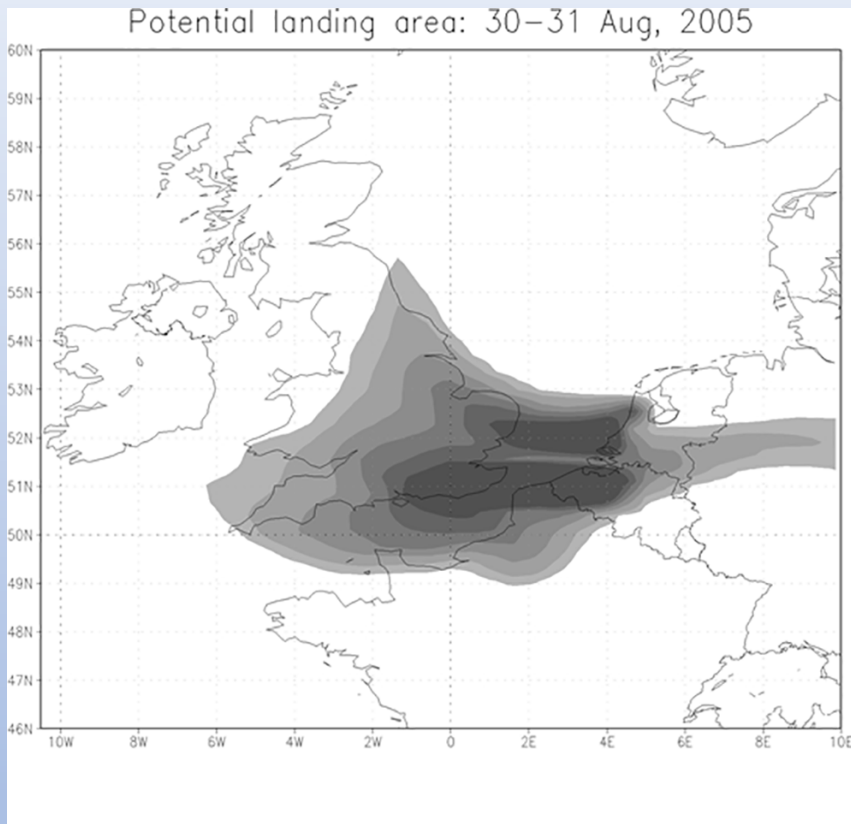
Dr Steve Coles, lead Worcester Biomedical Science Research Group

**Immunophenotyping AML Patient Blast Cells.** From left to right the image shows the gating of CD45 cells, excluding the lymphocytes which are CD45<sup>++</sup> / low SSC. You then see a heterogeneous blast population, with around 65% CD34<sup>+</sup> cells. Based on this gated blast population, CD200 expression level can be evaluated. The 3 histograms reveal CD200<sup>neg</sup>, CD200<sup>+</sup> and CD200<sup>++</sup> patients. The CD200<sup>++</sup> patients have the worse prognosis.



# Research at the University of Worcester

## Invasive Species



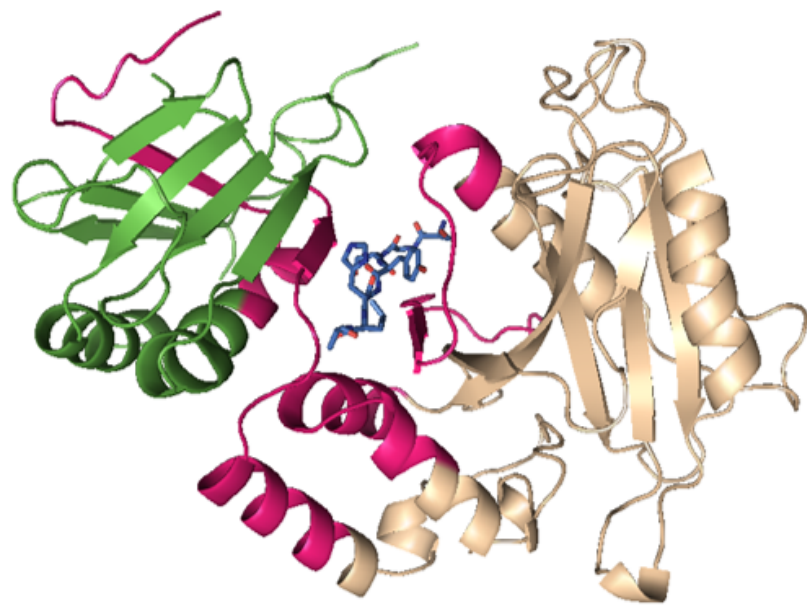
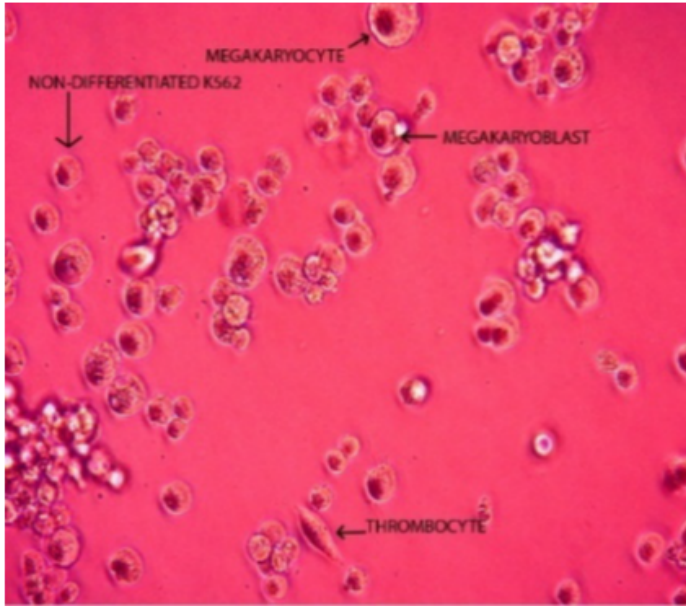
Dr Kate Ashbrook

**Modelling the invasion of non-native species.** Using modelling and comparing accounts of Harlequin Ladybirds noted in the UK with atmospheric phenomena it can be seen that weather patterns can be important in the colonisation events of invasive species



# Research at the University of Worcester

## Structural Biochemistry



Dr Amy Cherry

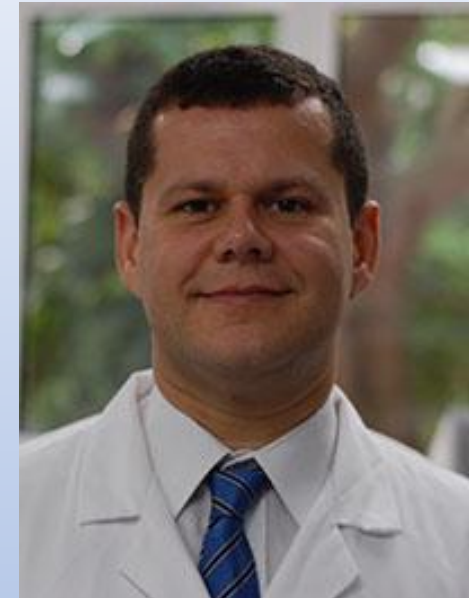
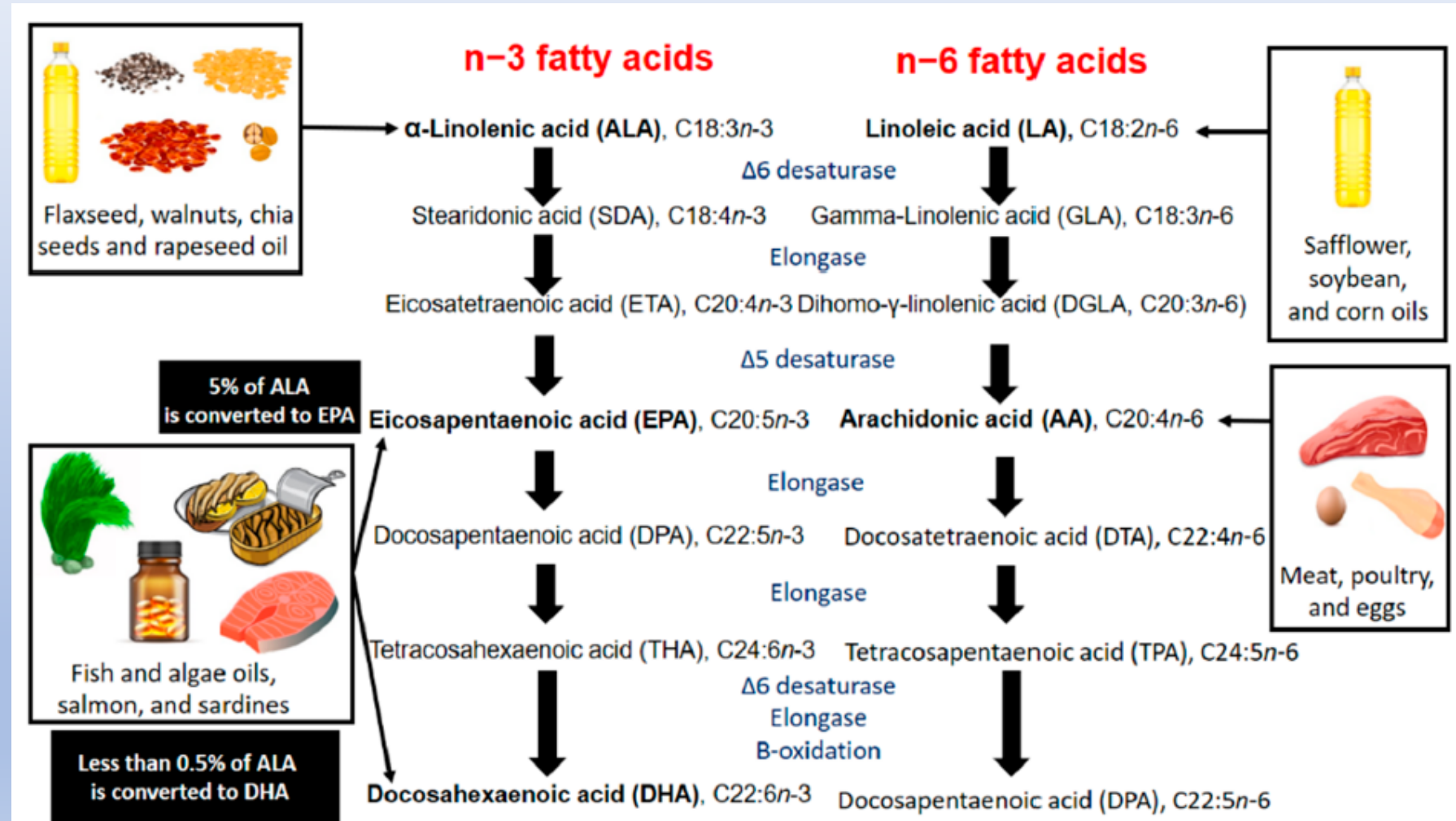
Studying interactions of components of the Hedgehog signalling pathway helps us understand how blood cells differentiate.

**Interactions of SuFu.** SuFu is one of the main components of the Hedgehog signalling pathway for which it acts as a negative regulator. The Hedgehog pathway is important in the differentiation of cells in all Bilateral animals and plays a role in haematopoiesis. Knocking down SuFu potentially changes differentiation of blood cells.



# Research at the University of Worcester

## Neurobiochemistry



Dr Allain Bueno

**The effect of diet on behaviour.** Fatty acids are found in specific foods, but they are also major components of our cells and organs, including the brain. Changes in relative proportions of fatty acids can affect behaviour.



# Research at the University of Worcester

## Plant Pathology



**The interaction of plants and pathogens involves multiple genes and proteins in both host and pathogen.** Here, antisense small RNA is used to target the cellulose synthase gene of downy mildew and inhibits pathogen infection. a) control b) sense small RNA c) antisense small RNA.



Professor Mahmut Tör



# Friendly and supportive environment

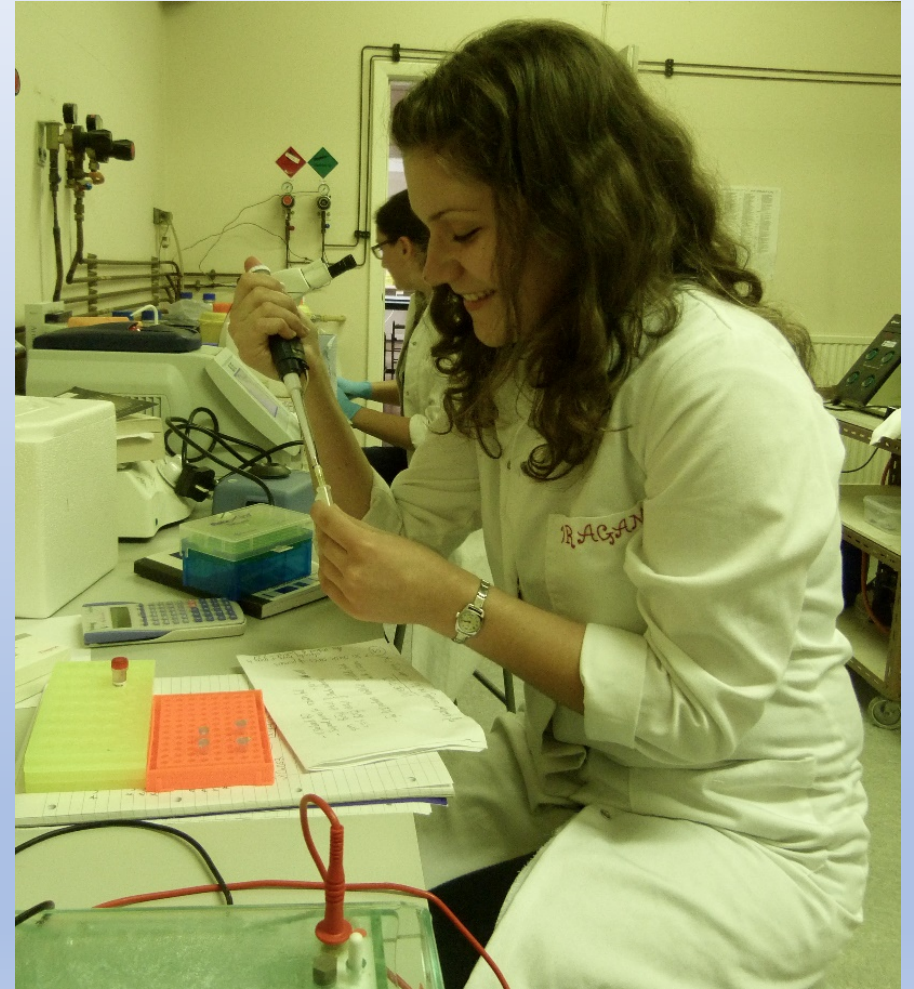
Small class sizes

Technician support in sessions and in student research laboratories

Open door policy

Personal Academic Tutors

Personal Development Planning





# Course structure – example – Biology year 1

Semester 1	Semester 2
<b>Cell Biology</b>	<b>Cell Biology</b>
<b>Animal Diversity</b>	<b>Animal Diversity</b>
<b>Introduction to Ecology</b>	<b>Comparative Animal Physiology</b>
<b>Introduction to Biological Chemistry</b>	<b>Introduction to Human Anatomy and Physiology</b>



# Course structure – example – Biology year 2

Semester 1	Semester 2
<b>Molecular &amp; Cellular Biology <u>or</u> Molecular Genetics &amp; Conservation</b>	<b>Molecular &amp; Cellular Biology <u>or</u> Molecular Genetics &amp; Conservation</b>
<b>Project &amp; Career Development</b>	<b>Project &amp; Career Development</b>
<i>optional module</i>	<b>Plant Biology</b>
<i>optional module</i>	<i>optional module</i>

Optional modules are: Work Experience, Animal Behaviour, Microbiology, Animal Senses & Survival, Human Genetics, Human Systems Physiology, Applied Human Metabolism, Invertebrate Biology

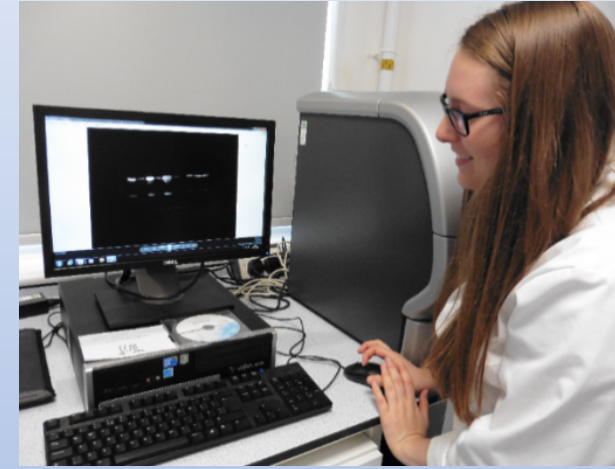


# Course structure – example – Biology year 3

Semester 1	Semester 2
<b>Independent Study</b>	<b>Independent Study</b>
<b>Plant Development &amp; Physiology</b>	<i>optional module</i>
<i>optional module</i>	<i>optional module</i>
<i>optional module</i>	<i>optional module</i>

Optional modules are: Mammalian Reproduction, Animal Movement, Forensic DNA Analysis, Pharmacology, Parasitology, Genomics & Bioinformatics, Animal Welfare & Ethics, Biochemistry of Cancer, International Biology Field Trip, Mediterranean Environments Field Course, Zoo-based Conservation

# Emphasis on specialist and transferable skills appropriate to further study or employability





# What can I do after a Biological Sciences degree?

**Most of our graduates choose careers that utilise the knowledge gained in their degree studies**

Postgraduate courses – MSc, PhD, graduate entry Medicine

Teaching – PGCE

Laboratory work in private companies

Research Assistants in Universities

Forensic practitioners

Work in the Food industry

Dietetics/Nutritionists

Physician Associates

NHS Biomedical Scientists/Health Care Scientists

Ecologists/Conservation

Clinical Research – drug trials

Scientific sales

Animal Welfare Officer/Education Officer



# How do we help our students enter their chosen career?

- 1 – Employability skills are embedded in the Biological Sciences curriculum
- 2 – Skills Passport
- 3 – Employers forum
- 4 – Using paid opportunities for students to do research
- 5 – The Worcester Award
- 6 – Networking with graduates via social media
- 7 – Workshops for postgraduate course access



# Embedded employability skills



## Careers module

A module in the 2<sup>nd</sup> Year, Project and Career Development



Allows the students the chance to hear about careers pathways from workers in many fields

Mock application, CV and interview for a real job advertisement with lots of feedback

Additionally students may take an optional Work Experience module



## Personal Academic Tutoring

All students are assigned the same Personal Academic Tutor for the three years of their degree – tutorials set aside to discuss employment aims, careers and CV writing



# **Paid research opportunities**





# Undergraduate awards



**Tiffany Slater** - 2016 Palaeontological Association Undergraduate Research Bursary - awarded £1,200 for “Sharks with question marks: Impacts of a new fossil on interrelationships of early bullhead sharks” – carried out at University of Vienna

Gained a place to study her PhD

# The Worcester Award



open to all University of Worcester students

recognises extra-curricular activities

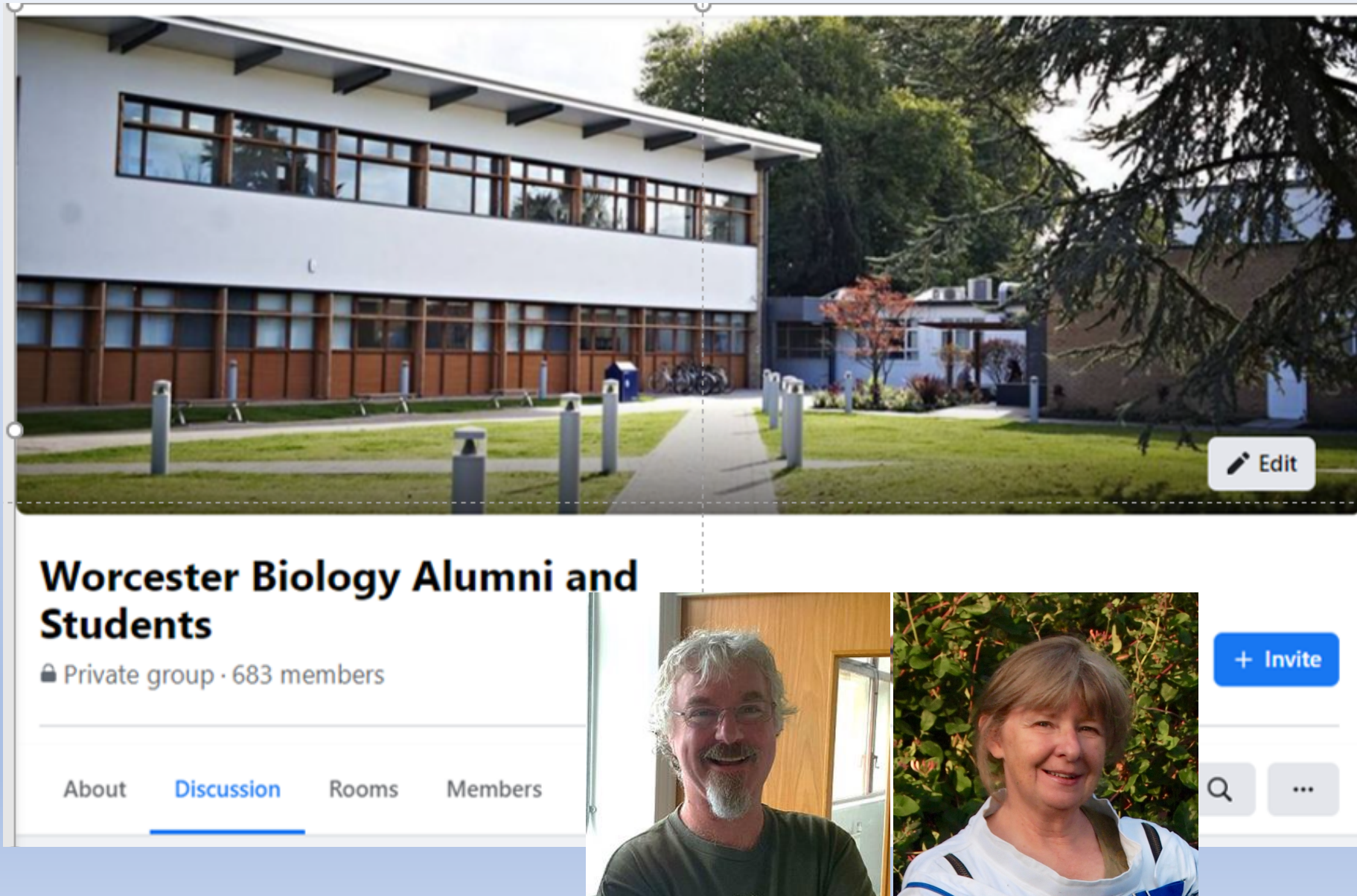
will boost your CV and is a great talking point in interviews

stated on your degree transcript

You receive a certificate



# Networking with alumni



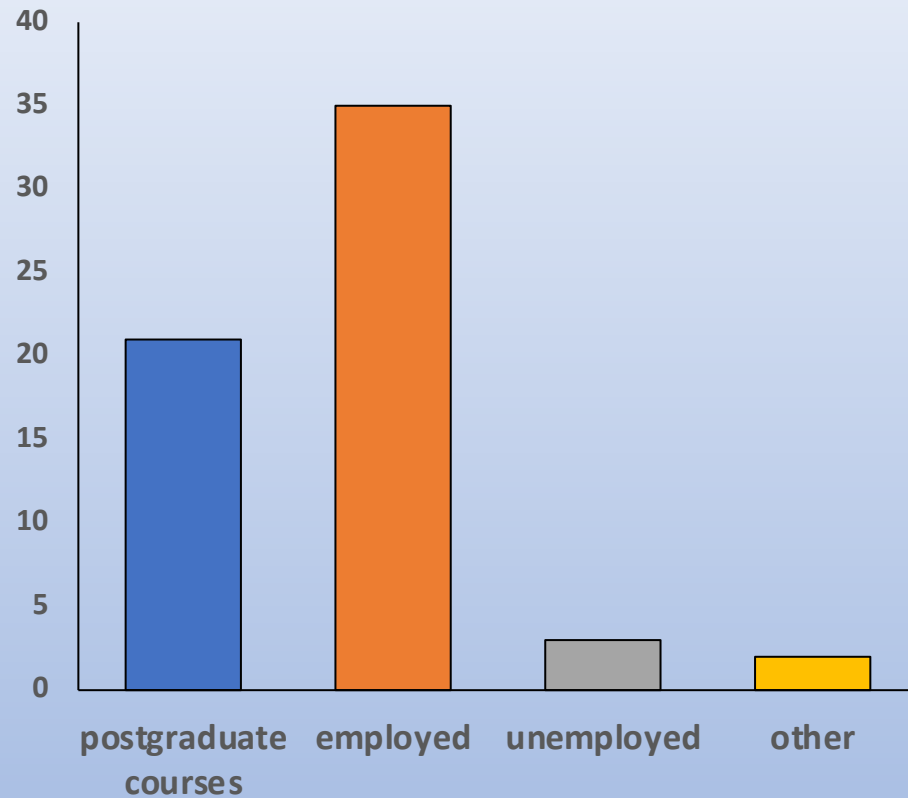
We initiated a Facebook group less than two years ago incorporating current students and past students

We use this to advertise jobs and volunteering opportunities

We also encourage current students to network with alumni who work in careers they wish to enter

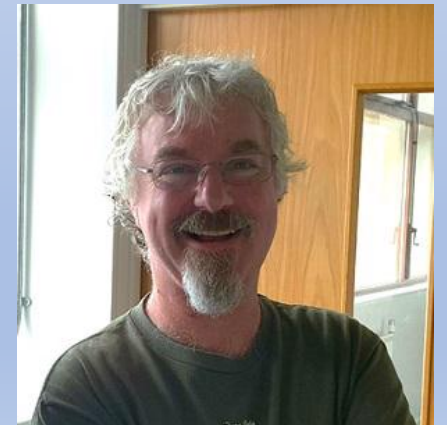
# Guiding students into postgraduate education

Employment 2017 leavers



We are really proud of the fact that so many of our Biological Sciences graduates go on to take Masters degrees and funded PhDs

We run workshops to guide students through access to postgraduate education and work with them on an individual basis on CVs and personal statements





# PhD scientist

Nick Buck– BSc Biology 2016



My PhD project is focused on the impacts of novel control strategies for the invasive fruit fly 'Spotted Wing Drosophila' (*Drosophila suzukii*) on different ecosystem services and crop production on UK raspberry farms.

*Nick Buck*



# Graduate entry Veterinary Science

**Shannon Bolton – BSc Animal Biology 2019**



I am now studying graduate entry veterinary science at the University of Bristol

“My degree opened the door to graduate entry where there is a lot more independent study and my degree from Worcester helps me out a lot from Animal Behaviour and looking at behaviour therapy in dogs to assessing welfare on farm of dairy cattle and chickens. I’m currently looking at gaining some experience back in the labs for some genetics research in the next year or two as part of my extramural studies and if I get the chance to be particular about what I do I’m hoping it’ll follow on from my dissertation on mitral valve disease in dogs.”

*Shannon Bolton*



# Forensic Analyst

Joe Butler – BSc Forensic & Applied Biology 2014



“Studying at the University of Worcester gave me access to great facilities, and the experienced, devoted and transformative tutors who developed the scientific skills that I use everyday in my career. I studied the emerging 'legal highs' for my independent project and now I am a court and crime scene attending forensic expert in drug analysis and about to start a PhD alongside it. Since my journey into forensics started, there's never been a dull day!”

*Joe Butler*

# Physicians Associate

Vicky George – BSc Human Biology 2018



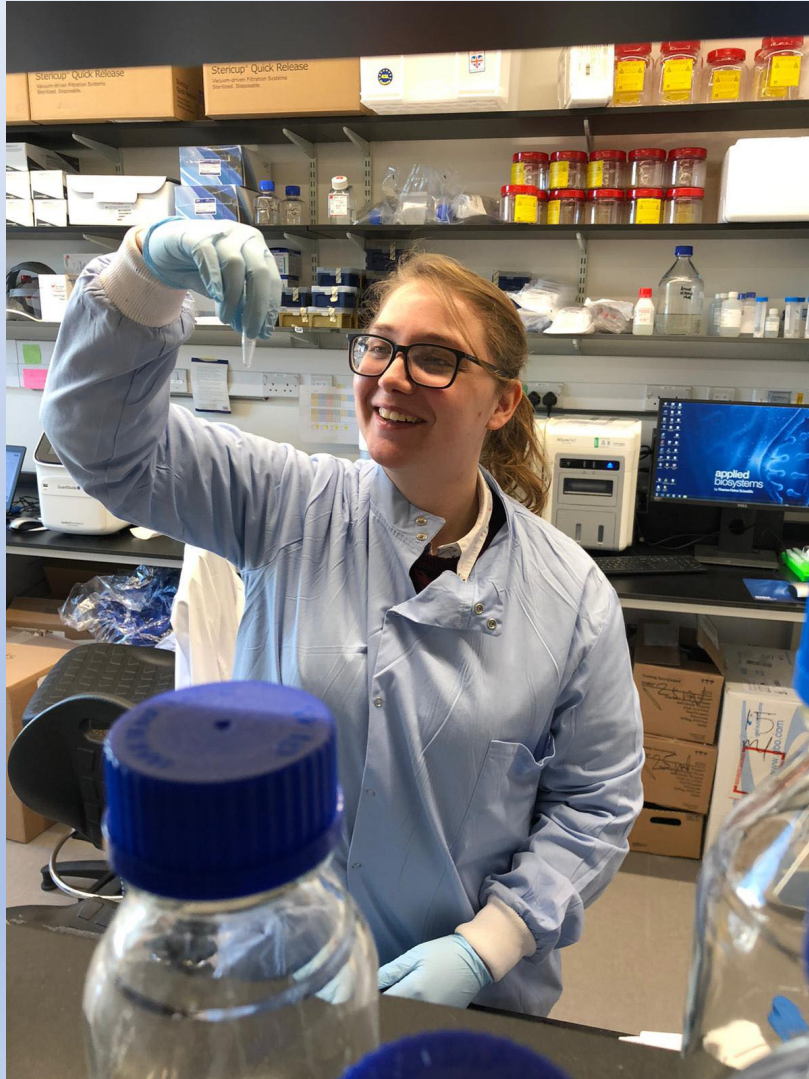
“From doing BSc Human Biology I became fascinated with disease especially because of Dr Allain Bueno who was so passionate about the human body. I decided to do my MSc in Physician Associate and fell in love with medicine. I passed my MSc and just sat my national exams awaiting my results and when I pass I will work as a PA in general practice”

*Vicky George*



# Research Scientist, Biotech company

Deanna Saunders – BSc Biochemistry 2017



“After university I got a job at Bio-Rad where I was involved in Raw Materials process for antibody production, developing core skills such as tissue culture, SDS-PAGE, and protein purification. Currently I work at Theolytics which is an Oxford University spin off company that develops viruses for different cancer therapies.”

*Deanna Saunders*

# Award winning University



University shortlisted for Times Higher Education  
University of the Year 2020

Awarded 1<sup>st</sup> Prize for Times Higher Education  
Equality, Diversity and Inclusion 2020



Any questions?

