Project Reference	SoCoBio DTP partner	Faculty/School/Department	Supervisor's full name	Start Date	End Date	Project Title	BBSRC Theme	Project overview including objectives (Max 300 words)
2024_01	NIAB at East Malling	Crop Science and Production Systems	Eleftheria Stavridou	01/07/2024	30/09/2024	Addressing Iron Deficiency through Fortification of Microgreens	Bioscience for sustainable agriculture and food;	Micronutrient deficiencies, stemming from malnutrition and hidden hunger, have emerged as a pressing global concern, further exacerbated by factors like climate change, the COVID-19 pandemic, and conflicts. In response, there is an increasing need for sustainable strategies to combat these challenges. One such avenue is the cultivation of nutrient-dense crops using agronomic biofortification techniques. Microgreens, with their short growth cycle, elevated nutrient content, and low levels of anti-nutritional factors, present a promising option for mineral biofortification. Iron deficiency in the human diet remains a significant threat to public health, particularly impacting young children and women. This deficiency can lead to malnutrition and related health issues. Addressing this challenge requires effective and timely interventions. Microgreens, due to their versatility and quick turnaround, offer a feasible and short-term solution through fortification. Various fortification approaches, including agronomic practices and nanotechnology applications, can enhance microgreens' iron content. The project objectives are to investigate fortification techniques to enhance the iron content of microgreens. During the project, the student will establish control environment experiments using a randomised complete block design and will test different fortification techniques. The microgreen biomass will be measured to assess the correlation between growth and iron accumulation. Several plant health indicators, including chlorophyll levels and leaf morphology, will be monitored. Iron will be measured spectrophotometrically.
2024_02	NIAB at East Malling	Crop science and Production Systems	Eleftheria Stavridou	01/07/2024	30/09/2024	Enhancing Sustainability: Assessing Salinity Tolerance in Modern Strawberry Varieties for Optimal Horticulture Practices	Bioscience for sustainable agriculture and food;	Strawberry (Fragaria x ananassa Duch.) is among the most economically and nutritionally important small fruit which is a rich and relevant source of bioactive constituents, including vitamin C, anthocyanins and flavonoids. Strawberry is a salt-sensitive crop and depends on salinity duration and degree, as well as plant phenological stages. Horticulture in England is facing ever-increasing pressures on freshwater resources, particularly in areas near the coast where saline intrusion of water courses is set to rise in the coming century. Much of the surface water (for abstraction) in the region remains brackish for large parts of the year, and there is also a shallow saline groundwater interface. Utilising slightly more brackish water for strawberry irrigation could alleviate reliance on freshwater, offering broader societal and environmental benefits by reducing strain on limited reserves for household, industrial, and agricultural purposes. This project endeavours to assess the salinity tolerance of various modern strawberry varieties, aiming to provide insights that enhance sustainable horticulture practices and contribute to the alleviation of freshwater pressure. Controlled environment experiments will expose different modern strawberry varieties to salinity stress. The selected varieties will undergo systematic monitoring of crucial plant growth parameters, including plant height, leaf area, and flowering patterns. The associated changes in proline content, antioxidant enzyme activities in response to salinity will be monitored.
2024_03	NIAB at East Malling	Crop Science and Production Systems	Belinda Kemp	15/07/2024	23/08/2024	Characterisation of stomatal traits for climate resilience in grapevine	Bioscience for sustainable agriculture and food;	This project is focused on understanding variation in stomatal traits among grapevine cultivars planted at the NIAB East Malling research vineyard. Stomata are microscopic pores on plant leaves that regulate water loss and photosynthesis. Stomatal activity is acutely sensitive to environmental conditions, which makes them interesting targets for crop improvement, especially under climate change. Extensive variation in stomatal density, the number of stomata per mm2, has been observed within horticultural crop species and this variation drives intrinsic cultivar differences in water loss and photosynthesis. Here, we aim to (i) characterise diversity in stomatal density across cultivars using leaf imprints and light microscopy; (ii) measure cultivar differences in gas exchange (water vapor and carbon dioxide) using hand-held measurement devices; and (iii) identify extreme cultivars that exist on the high and low ends of the spectrum for (i) and (ii). The identification of extreme cultivars will provide the foundation for future investigations of grapevine physiology and suitability of specific cultivars for resource efficient production systems in the UK. Technical skills acquired by the student will include plant phenotyping in the vineyard and laboratory using state-of-the-art measurement devices, quantitative and statistical data analysis, experimental design of field studies, and project execution.
2024_04	NIAB at East Malling	Crop Science and Production System	Eleftheria Stavridou	01/07/2024	30/09/2024	Effects of plant nutrient on flowering, fruit-setting and pollen characteristics of tomato under heat stress	Bioscience for sustainable agriculture and food;Understanding the Rules of Life;	Tomatoes (Solanum lycopersicum) are integral to global food security, providing essential nutrients; however, their sustainable cultivation faces challenges from abiotic stressors like extreme temperatures, water scarcity, and nutrient deficiencies. These stressors impact critical stages of tomato reproduction, notably pollen fertility and fruit-setting, affecting both yield and quality. Recent agricultural research has explored the application of nanoparticles, a promising avenue for overcoming these challenges. Nanoparticles possess unique properties, such as high surface area and reactivity, making them ideal for targeted nutrient delivery to plant cells. This has the potential to enhance nutrient absorption efficiency, fostering robust plant growth and development. Another key player in stress mitigation is ascorbic acid, or vitamin C, which acts as a critical antioxidant in plants. Its multifaceted role includes neutralising reactive oxygen species, thereby mitigating oxidative stress. By fortifying the plant's antioxidant defence system, ascorbic acid can enhance stress tolerance, improve overall plant health, and potentially influence reproductive processes crucial for fruit development. The project's objectives are to investigate the effects of various nanoparticles and diverse concentrations of ascorbic acid on tomato pollen fertility, assess their immediate impact on fruit-setting under abiotic stress, and begin unravelling the initial physiological mechanisms contributing to stress alleviation in tomatoes. The methodology involves controlled environment experiments exposing tomato plants to varying concentrations of nanoparticles and ascorbic acid under environmental stress conditions. Microscopy and in vitro assays will be employed to assess pollen viability and germination. Throughout the experiment, parameters like fruit-set percentage, yield, and quality will be measured. Physiological and biochemical analyses will provide insights into the underlying mechanisms contributing to stress alleviation.

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2024_05	Univerity of Kent	School of Biosciences	Dave Beal	01/07/2024	12/08/2024	Production of Anti-cancer Nanobodies Using Vesicle Based E.coli Production.	Bioscience for an integrated understanding of health;	The treatment of cancer has, traditionally, been treated with non-specific chemotherapies which not only kill cancer cells but also healthy cells. Recent innovations in the development of biotherapeutics has led to targeted therapeutics, based on antibodies, which deliver a drug to a specific cell e.g. a cancer cell. Key to these molecules is the attachment of a drug to antibody in a site-specific manner. Research has shown that antibody fragments encompassing the antigen binding region of antibodies have some advantages including increased tumour penetration. Nanobodies are single chain antibody fragments, derived from camelids, which have great utility as therapeutic and diagnostic agents. In this project we will focus on the production of a nanobody which targets a protein important in some breast cancers, Her2. This nanobody has been engineered to contain a C-terminal cysteine residue for the attachment of drugs and diagnostics tools and has been utilised by the Beal lab (Kent) for some time to develop protein poly-modification strategies. In this project we will investigate the use of an e.coli vesicle based recombinant protein production system, developed in the Mulvihill lab (Kent), and shown to give exceptional yields to produce this anti-Her2 nanobody. To carry out this project will use externally synthesised plasmid DNA encoding the tagged Her2 nanobody sequence. The objectives of this project are: Determine optimum expression/TEV cleavage conditions for the production of the nanobody. Investigate purification strategies to produce homogeneous material. Compare the yield and purity to that of nanobody produced in the periplasm of e.coli. Investigate the oxidation state (monomer/dimer) of the synthesised nanobody. Using PEG trapping experiments look for the optimum modification conditions. Skills to be developed: Recombinant protein production (e.coli), protein purification/analysis and chemical modification of proteins.
2024_06	Univerity of Kent	School of Biosciences	Prof Campbell Gourlay	17/06/2024	29/07/2024	Interkingdom interactions within biofilms as a driver of antimicrobial drug resistance	Bioscience for an integrated understanding of health;Understanding the Rules of Life;	Biofilms, complex microbial communities encased in a self-produced extracellular matrix, represent a significant challenge in combatting antimicrobial drug resistance. This study explores the dynamic interkingdom interactions within biofilms and their role in the development and propagation of antimicrobial resistance. Focusing on the crosstalk between bacteria and fungi in biofilms, we investigate how these interactions contribute to the emergence of multidrug-resistant strains. The research employs advanced molecular techniques to unravel the intricate signaling pathways and communication mechanisms involved in interkingdom interactions. By elucidating the synergistic or antagonistic relationships between different microbial species, we aim to identify key factors influencing the evolution of drug resistance. Furthermore, the study explores the impact of biofilm architecture and extracellular matrix composition on the development of protective mechanisms against antimicrobial agents. Insights gained from this research have implications for the design of more effective antimicrobial strategies.
2024_07	Univerity of Kent	Biosciences	Dr. Anastasios Tsaousis	08/07/2024	18/08/2024	Bioconversion Innovation: Enhancing Poultry Growth and Health with Black Soldier Fly Larvae	Bioscience for sustainable agriculture and food;	This project revolves around the versatile Black Soldier Fly Larvae (BSFL) and their potential to convert food waste and organic substrates into valuable resources, primarily animal feed and fertilizer (Frass). BSFL can also serve as a sustainable protein source for humans, although this aspect is not within our project's scope. Key objectives of our research include manipulating the BSFL gut microbiome, optimising their diet during different growth stages, and examining potential benefits for poultry. Objective 1. Manipulating Gut Microbiome: The BSFL process substrates through their gut microbiome, comprising various microorganisms influenced by the substrate type. Our project aims to assess if the gut microbiome can be manipulated using different substrates and probiotics. This manipulation is intended to enhance their ability to convert specific organic materials efficiently. Objective 2. Diet Optimization: The production process involves multiple stages, from egg to neonate, and 7-day-old to 14-day-old larvae. During the early stages (0-7 days), BSFL are fed a diet based on the Gainesville formula, promoting survival and growth. Subsequently, various substrates like brewers' grains, fruits, vegetables, and bakery wastes are bioconverted into more valuable resources during the 7-14 days stage. Objective 3. Influencing Poultry Gut Microbiome: Under current UK regulations, BSFL can only be fed live to livestock groups like poultry, preserving their gut microbiome. Our project aims to influence the BSFL gut biome and consequently impact the gut microbiome of day-old chicks, which can significantly influence poultry growth and health. In summary, this project's objectives encompass manipulating the BSFL gut microbiome, optimising their diet, and examining the potential benefits of BSFL consumption for poultry. The research aims to find sustainable solutions for bioconversion, livestock nutrition, and improving overall agricultural practices.
2024_08	Univerity of Kent	School of Biosciences	Rebecca Hall	01/07/2024	12/08/2024	Understanding immune evasion of Candida albicans	Understanding the Rules of Life;	Candida albicans is an opportunistic fungal pathogen that forms part of the natural flora of the oral, genital, and gastrointestinal tracts of healthy individuals. However, changes in the host's environment activate adaptation responses in the fungus that enable the fungus to switch from commensal growth to a more pathogenic state. The innate immune system recognises the pathogen through detection of cell wall carbohydrates, and via the deposition of complement proteins on the fungal cell surface. We have identified that in response to specific environmental conditions, C. albicans alters its cell surface enabling the pathogen to avoid the actions of our innate immune system. This immune evasion phenotype is linked to the ability of the fungus to avoid complement activation, but precisely how this is mediated is unknown. In this project you will develop skills in mammalian cell culture, microbiology, and flow cytometry to address the following research objectives: 1) Confirm environmental adaptation induces immune evasion 2) Identify key C. albicans genes involved in immune evasion phenotypes 3) Use flow cytometry to quantify the presence of human complement proteins on the fungal cell surface. In addition to basic lab skills, you will also develop skills in experimental design, data analysis and presentation, critical analysis, and working as part of a team.

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2024_09	University of Portsmouth	Faculty of Science and Health/ School of Pharmacy and Biomedical Sciences	Susanne Dietrich	01/07/2024	09/08/2024	genetic mechanisms controlling cardiac versus skeletal muscle competence	Understanding the Rules of Life;Bioscience for an integrated understanding of health;	We recently showed that there is a distinct transition period in which parts of the head mesoderm surrender their cardiac competence and instead, acquire the competence to deliver the skeletal muscles of the neck and face. Notably, in human heart failure, heart muscle cells partially lose their cardiac identity and erroneously express skeletal muscle genes. To which extent cells adopt the transitory state found in the embryo is not known. This is because the mechanisms controlling cellular competence in the embryonic head mesoderm aren't known. Using a bioinformatics approach, we have identified genes that may regulate the switch from cardiac to skeletal muscle competence, and we have generated molecular constructs to test that idea. WE propose to misexpress these constructs in the chicken embryo, and then assay for the changes in the expression of heart and head skeletal muscle marker genes, using a variety of techniques including in situ hybridisation, immuno-stainings and qPCR.
2024_10	University of Portsmouth	Biological Science	Dr Binuraj Menon	15/07/2024	15/09/2024	Development of novel halogenase enzymes for biopharmaceutical applications	Bioscience for renewable resources and clean growth;Understanding the Rules of Life;	Identification of new halogenated synthetic, natural and non -natural compounds; and further exploitation and synthesis of these compounds are of extreme importance in this modern era. This is due to the profound role of organohalides as pharmaceuticals, agrochemicals and valuable synthons in various reactions. Biosynthetic halogenation can occur over simple to extremely complex ring structures of natural compounds and in some cases it initiates the formation of complex structures and scaffolds. These reliable, facile and cleaner biosynthetic routes have potential utility and greater demand over traditional non-enzymatic halogenation chemistry that requires deleterious reagents. In the past few years we have identified a number of pharmaceutically important halogenases by genome mining in natural product pathways. In this project, we are planning to explore their structure, substrate scope along with their potential applications. This will be via purifying these enzymes, setting up different enzymatic assays and analysing them using various biophysical characterisation techniques, including HPLC, plate reader assays etc. The ultimate aim is to incorporate these enzymes in to synthetic and biosynthetic pathways and into various natural product pathways for biotechnological and pharmaceutical applications
2024_11	University of Portsmouth	School of Biological Sciences, Faculty of Science and Health	Dr Samuel Robson	01/07/2024	09/08/2024	Using long read nanopore sequencing to understand DNA viability following cryopreservation of Xenopus laevis for protection of biodiversity	Understanding the Rules of Life;Bioscience for sustainable agriculture and food;	Changing climate and anthropogenic activities are affecting life on a global scale, with changes to marine, terrestrial, and freshwater ecosystems significantly threatening biodiversity. A major solution for preventing biodiversity loss is through the creation of conservation biobanking programs such as frozenark.org, using cryopreservation of cells from endangered species across the animal kingdom, allowing for re-establishment of diversity through assisted reproductive programs. To enable such programs to have a successful impact, it is essential to ensure that integrity of genetic material is maintained to enable establishment of cell lines following long term storage. In this project, you will assess the impact of long term cryopreservation on DNA viability in cryopreserved cells from the amphibian Xenopus laevis. This species currently has a conservation status of 'Least Concern', ensuring precious samples are not required. In addition, this species will allow comparison with fresh specimens from the European Xenopus Resource Centre (EXRC) at the University of Portsmouth. You will extract and assess the quality of DNA from cryopreserved X. laevis kidney cells, which have been in storage since 2011, and fresh X. laevis kidney cells for comparison. This will be based on standard DNA quality assays including TapeStation, Nanodrop and Qubit, as well as the single cell DNA damage comet assay. In addition, you will use long read DNA sequencing to identify precise DNA breakpoints, using the Oxford Nanopore Technologies GridION. These data will also allow you to assess the level of methylation of cytosine residues between cryopreserved and fresh samples, to understand epigenetic changes to DNA as a result of long term storage, and links to DNA damage. This project will give you a wide range of experiences in the use of cutting edge genomic techniques, including opportunities to develop wet-lab skills and bioinformatics expertise, to address a highly impactful research question.
2024_12	University of Southampton	Faculty of Environmental Life Sciences (FELS)/School of Biological Sciences (SOBS)	Mark Chapman	01/07/2024	09/08/2024	Why were some species domesticated and others abandoned as foods?	Understanding the Rules of Life;Bioscience for sustainable agriculture and food;	Of the thousands of edible species only about 200 are considered domesticated. What made certain species amenable to domestication and others not? In this project the student will help to analyse populations of crops, their wild progenitors and other wild related species to help determine the role of different genes in the domestication process, and whether there are fundamental differences between the progenitor (which was domesticated) and the other wild species which weren't. It will involve lab and greenhouse work, with some data analysis.
2024_13	University of Southampton	Medicine / Cancer Sciences	Tim Fenton	01/07/2024	09/08/2024	Investigating the role of APOBEC3A in wound healing	Understanding the Rules of Life;Bioscience for an integrated understanding of health;	In our lab we study an enzyme (APOBEC3A) which can mutate DNA by converting cytosine bases into uracil. This activity enables it to restrict viral replication by mutating viral genomes but work by ourselves and others has shown that off-target APOBEC3A activity against the cellular genome is a major cause of somatic mutations in human cancer. In a BBSRC-funded project, we are studying the regulation and function of APOBEC3A in epithelial cells (keratinocytes) and have recently found that the APOBEC3A gene is activated by GRHL3 - a transcription factor that plays important roles in epithelial differentiation and in wound healing responses. We have also conducted global gene expression profiling (RNA-seq) in keratinocytes in which we used CRISPR-Cas9 to delete the APOBEC3A gene, which has enabled us to identify a potential new functional role for APOBEC3A in wound healing. In this summer project, you will work with a postdoctoral researcher in the lab, using functional assays to compare wound healing responses between wild-type and APOBEC3A knockout keratinocytes. You may also use 'add-back' cells, in which we have engineered inducible expression of wild-type APOBEC3A or an enzymatically inactive mutant (E72A) APOBEC3A, to examine whether the catalytic activity is important for APOBEC3A's role in wound healing. Objectives: 1)To learn mammalian cell culture (human keratinocytes, which we grow on a layer of mouse fibroblast feeder cells). 2)To conduct scratch assays and transwell assays to measure rates of closure between WT and APOBEC3-KO cells and between APOBEC3A-WT and APOBEC3A-E72A add-back cells. 3)To use immunofluorescence microscopy and/or qRT-PCR to compare APOBEC3A levels between proliferating, differentiating and migrating keratinocytes. You will learn a variety of important cell biology techniques and join in with our lab meetings and journal clubs to get an overall feel for the research happening in our group.

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2024_14	University of Southampton	School of Chemistry	Dr George Williams	15/07/2024	26/08/2024	Dual output probes for understanding multispecies bacterial biofilms	Bioscience for an integrated understanding of health;Understanding the Rules of Life;	Identification of microbes is essential for efficient treatment. However mixed species biofilms complicate this considerably. Fluorescent probes are one such tool towards the detection and differentiation of bacterial species and strains, however, single probe systems often display poor selectivity, as their targets are often conserved across different species and strains. Aminopeptidases catalyse the cleavage of amino acids from the amino terminus of a peptide or protein. These enzymes are differentially expressed depending on the microbial species, and are of particular relevance to the virulence of Pseudomonas aeruginosa, suggesting that the aminopeptidase signature may be useful for identifying species present in polymicrobial communities. This project encompasses the development of of aminopeptidase sensitive probes which upon activation by bacteria emit fluorescence and undergo a ratiometric change in Raman signal, which can easily be detected. By using high-throughput assays to characterise the how different species interact with these probes or probe-combinations, we will look to identify species-specific signatures. This project will initially be based in the School of Chemistry, where the synthesis and initial activation studies will be conducted. With these data in hand, the student will move to the School of Biosciences to learn bacterial cell culture and imaging techniques under the supervision of Dr Callum Highmore.
2024_15	University of Sussex	Life Sciences, Ecology & Evolution	Dr Beth Nicholls	15/06/2023	27/07/2023	How do bees choose where to forage?	Bioscience for sustainable agriculture and food;	Plant-pollinator interactions are vital for global food security, therefore understanding the drivers of individual foraging decisions is crucial to manage risks posed by a lack of pollinators. While nectar foraging is generally understood, little is known about the costs of pollen collection. For nectar, the energetic cost of flower handling and reward collection is considered minimal compared to the flight costs associated with flying between patches of flowers, and is assumed not to factor highly into bees' assessments of foraging profitability. In contrast, pollen collection requires a more complex set of behaviours that can be adjusted with experience, and behavioural requirements vary considerably depending on flower morphology. These costs have never been explicitly quantified, so their contribution to bees' foraging decisions remains unclear. Moreover, while flower orientation has previously been shown to affect the transfer of pollen between flowers by bees, with implications for the effectiveness of pollination service delivery, the associated impact on the pollen collection efficiency and foraging choices of bees has been little explored. Using behavioural assays and AI automated tracking software, you will test bee flower orientation preferences across flower morphologies. You will then observe how flower orientation affects bee pollen collection efficiency and whether it can improve with experience. Finally, you will examine whether this preference can be shifted by manipulating the value of the floral reward. This project will provide insight on the handling costs associated with pollen foraging, as well as the role of experience and individual cost-benefit assessments in the development of foraging preferences. Objectives: 1.Test whether bees prefer a certain flower orientation during pollen collection 2.Observe how flower orientation affects bees' pollen collection efficiency and whether it can improve with experience 3.Manipulate floral rewards to examine whether preference for a particular flower orientation can be shifted
2024_16	University of Sussex	School of Psychology	Dominique Makowski	01/07/2024	09/08/2024	Understanding how the brain and the body react to the unreal	Understanding the Rules of Life;	The placement will take place at the Reality Bending Lab, in the School of Psychology of the University of Sussex. Led by Dr Dominique Makowski, the team researches reality perception, fake news, illusions, fiction, deception, self-control and more, by recording signals from the body (ECG, EDA…) and the brain (EEG). We analyse data using advanced computational modelling (Bayesian stats, chaos theory, mixed models…), and we also develop open-source tools and software to improve neuropsychological science. In this placement, you might lead a particular research project and/or provide support for the lab's wide range of ongoing projects, which will advance our understanding of how we appraise and form beliefs regarding reality. Some of these projects might involve collaborations with members from the lab, and partners from the university or from international institutions (such as France, Italy, or Singapore). Examples of research directions include: • How do we know what is real? And what does it change? Can fiction help us regulate one's emotions? • How is our experience of reality and our cognitive abilities shaped (consciously and unconsciously) by bodily signals and emotions: the role of bodily signals and interoception in cognition and consciousness. • Development and validation of new neuropsychological tasks (e.g., task based on illusions, and/or videogame to assess cognitive control). • Metascience and data science: development of algorithms to process physiological signals (in Python) and work on packages to improve access to statistics (in R). More specific examples can be found at: https://realitybending.github.io/jobs/projects/ Examples of technical skills you can acquire: - Experiment design and creation (in Python/PsychoPy or JavaScript/jsPsych) - Neuroimaging and Physiology: EEG and bodily signals recording and analysis (EDA, ECG, RSP, …) - Advanced statistics and data science (mixed models, Bayesian stats, …) - Programming (Python, R, Julia) - Scientific communication and popularization

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2024_17	University of Sussex	School of Life Sciences	Beth Nicholls	01/07/2024	30/09/2024	Taste perception of pollen compounds in wild bees	Bioscience for sustainable agriculture and food;	When foraging, pollinating insects such as bees must continuously decide which flowers to visit and which to ignore. What seems like a small choice can determine the reproductive success of both pollinators and flowering plants, including many important food crops. This project will investigate how bees make such decisions. To encourage pollinators to visit, flowering plants usually offer two types of rewards to pollinators for visiting: nectar, a sugar-rich solution, and pollen, tiny grains rich in protein and fat. Bees and other insects have taste organs on their antennae, mouthparts and feet. While visiting flowers, contact between these taste organs allows bees to gather information about the nutritional contents of what the food rewards they are collecting or eating. While it is known that bees make foraging decisions on the basis of how sugary nectar is, the role of taste in assessing pollen rewards is poorly understood. By recording the neural activity of taste receptors on the mouthparts, we have previously shown that one common species of bumblebees is sensitive to a range of amino acids, the building blocks of proteins. In this studentship, you would collaborate with researchers to gather and analyse data from other wild bee species that differ in their diet breadth. While some bee species specialise on foraging from one type of flower only, others are generalist foragers that visit a wide range of flowers. Understanding why this difference in flower preferences exists and how bees select suitable flowers is key for both the conservation of wild bees and plants, and sustainable food production. Depending on your interests, you will learn how to safely catch wild bees and identify them, and you will have the chance to learn how to analyse electrophysiological recordings from their taste receptors. You will develop skills in field ecology and the analysis of lab data, as well as gaining a deeper understanding in why and how insect diets differ.