

Faculty of Science

Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI042
Project title:	Finding needles in haystacks: Australasian bittern/Matuku bioacoustics
Discipline:	School of Biological Sciences
Supervisor(s)	Prof Dianne Brunton
Contact details	dianne.brunton@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Interest in ecology or conservation• Willingness to do fieldwork (Comfortable visiting wetlands, sometimes in the evening)• Basic computer skills (spreadsheets, simple software)• Attention to detail
<p>Project description: The Australasian bittern (Matuku; <i>Botaurus poiciloptilus</i>) is one of Aotearoa New Zealand's most endangered wetland birds. Their populations have significantly declined due to habitat loss and predation. Improving methods for detecting and monitoring this cryptic species is therefore a priority for its conservation. This summer project will investigate bittern presence and activity patterns in local wetlands using a combination of simple field-based surveys and acoustic analysis. The student will be working alongside a postgraduate student to conduct evening listening surveys to detect booming males and assist with the deployment of acoustic recorders. Audio recordings will be reviewed to identify and log bittern calls, producing a dataset of detections across sites and times. By comparing field observations with acoustic data, the project will provide insights into the effectiveness of different survey approaches and the timing of bittern activity.</p> <p>The study will generate useful presence data to support ongoing research while providing practical experience in field ecology, bioacoustics, and data handling. This project provides an opportunity to gain practical experience in ecological research while contributing to the conservation of the threatened Matuku. The summer student will develop core field skills through hands-on experience and learn bioacoustics techniques by working with audio recordings.</p>	



The Australasian bittern (Matuku; *Botaurus poiciloptilus*). Image: rempson, 2020, iNaturalist

Faculty of Science

Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI043
Project title:	Variation in myrtle rust susceptibility of pōhutukawa in Auckland city
Discipline:	School of Biological Sciences
Supervisor(s)	Assoc Prof Bruce Burns Dr Mahajabeen Padamsee
Contact details	b.burns@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• A general interest in botany and plant pathology• Attention to detail
Project description <p>Myrtle rust (<i>Austropuccinia psidii</i>) is a virulent plant pathogen of the family Myrtaceae, with the rust now having spread globally and infecting >500 plant species. It arrived in New Zealand in 2017 and is still spreading. Because it is a recent arrival, our understanding of host susceptibility and disease progression is also still developing, both within and amongst species. For pōhutukawa within Auckland, infections of individuals seem to vary by infection date, location, plant size, proximity to roads, and whether the plant was planted or wild grown. Sometimes infected plants and healthy plants occur directly next to each other. This proposed project would build on previous surveys of pōhutukawa within Auckland to score the infection status of trees and a range of potential factors (e.g., size, proximity to roads, and likely origin) that influence susceptibility to infection. These data would then be analysed for infection patterns both within and between years. The goal is to determine factors (host, environment) that determine levels of myrtle rust infection to better understand the infection process and inform management response.</p>	



Pōhutukawa (left) and close-up of myrtle rust infection on pōhutukawa leaves (right)

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Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI044
Project title:	Miromiro nesting behaviour
Discipline:	School of Biological Sciences
Supervisor(s)	Assoc Prof Kristal Cain
Contact details	k.cain@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Work will be mostly off-campus (Hūnua Regional Park) – a valid license and access to a vehicle will be important• Willingness to work outdoors for long hours with wild birds in native and pine forests
Project description <p>Miromiro North Island tomtits are an understudied native species, with stable populations in both native and exotic environments. Their ecological ability to survive in both environments leaves the question – are they doing different things in the two habitats?</p> <p>This summer research project will help develop an understanding of the breeding ecology of the North Island tomtit in these two environments. You will help a small team with finding nests, catching and banding birds, locating and monitoring nests, and conducting behavioural observations. Some work might include collecting moss – with a focus on the moss species the birds use to build their nests.</p> <p>This project is based in Hūnua Regional Park (SE of Auckland).</p>	



North Island tomtit (left-male, right-female). Images: Pete McGregor, 2015, iNaturalist and Jacqui Geux, 2016, iNaturalist

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Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI045
Project title:	Pukeko mating systems and ornaments
Discipline:	School of Biological Sciences
Supervisor(s)	Assoc Prof Kristal Cain
Contact details	k.cain@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Work will be off-campus (Tāwharanui Regional Park) – a valid license and access to a vehicle will be important• Willingness to work outdoors for long hours with wild birds in open fields/pastures
Project description <p>Pūkeko are incredible successful, and some of that success is due to flexibility in terms of behaviour and mating systems. In the warmer north, they live in big multi-female and male groups and are territorial year-round. In the cold south, they live in pairs and are only territorial part of the year. How do they manage such flexibility?</p> <p>This summer project would be aiding a PhD student interested in the hormones that regulate pūkeko behaviour, morphology (shield size) and breeding systems. You will help with finding nests, catching and banding birds, locating and monitoring nests, and conducting behavioural observations.</p> <p>This project is based in Tāwharanui Regional Park (North of Auckland).</p>	



Adult pūkeko

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Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI046
Project title:	How do geothermal plants survive extreme heat stress?
Discipline:	School of Biological Sciences
Supervisor(s)	Dr Chris Carrie Dr Sarah Jessup
Contact details	chris.carrie@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• An interest in extreme plant biology• Knowledge of plant physiology• Knowledge of molecular biology and genetics• Would suit students who enjoyed BIOSCI 205, 326 or 351
<p>Project description: Aotearoa/New Zealand is home to one of the most extreme environments globally; the fumarole fields of the Taupō Volcanic Zone have extremely high soil temperatures (>60°C). This well exceeds the heat tolerance of most plants with damage and mortality usually occurring at temperatures above 45°C. Yet dozens of extremophile plant species live and thrive in fumarole fields (e.g., geothermal Kānuka). Leveraging this unique ecosystem, we hypothesise that identifying and transferring extremophile traits and genes to non-adapted crops will improve their heat tolerance and is a viable approach to developing climate- and future-ready crops.</p> <p>This Summer Research Project will form part of our ongoing research into how geothermal plants survive extreme heat stress. You will undertake studies involving plant physiology, plant growth and plant molecular biology with native extremophile plant species.</p>	



Example of geothermal Kānuka growing in soil at 86°C

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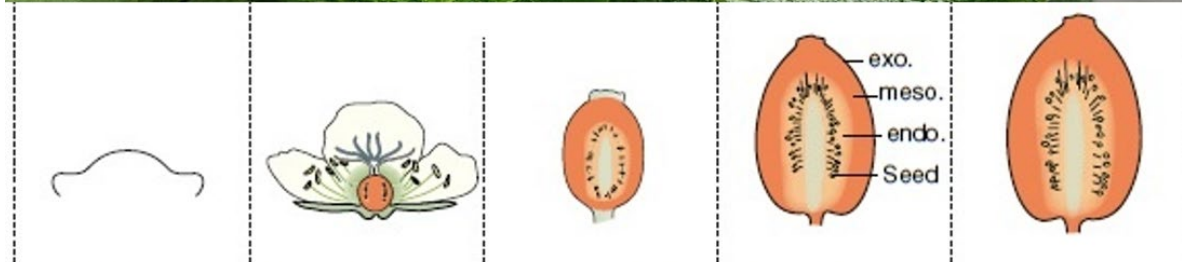
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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI047
Project title:	Molecular mechanisms controlling fruit development
Discipline:	School of Biological Sciences
Supervisor(s)	Dr Karine David
Contact details	k.david@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Background in Molecular Biology and/or Genetics

Project description

Fruits are essential for our day-to-day diet. The aim of the project is to contribute to our understanding of the mechanisms that are important for fruit development especially fruit flesh and size. Candidate genes have been identified and for some mutants have been generated using CRISPR-Cas9. During the project, the aim is to either start characterising the kiwifruit-edited plants or cloning key transcription factors involved in apple fruit flesh development to transform plants. Key techniques: Plant molecular biology such as bioinformatics - cloning - genotyping - gene expression analysis.



What genes make a fruit fleshy and big?

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI048
Project title:	From genomes to proteins
Discipline:	School of Biological Sciences
Supervisor(s)	Dr Richard Kingston Assoc Prof Shaun Lott
Contact details	rl.kingston@auckland.ac.nz
Skills Needed	
Project description Recent technological advances have made the sequencing of genomes increasingly accessible. However, the problem of annotating and interpreting genome sequences remains. In particular, the computational prediction of the proteins encoded by eukaryotic genomes is still imperfect. This is because eukaryotic gene sequences contain both expressed regions (exons) and non-expressed regions (introns), the latter being spliced out of RNA after it is transcribed. Studying protein-encoding and fully processed messenger RNA (mRNA), from which all the introns have been removed, provides information that is critical for understanding eukaryotic gene splicing and protein production. In this project, you will isolate mRNA from one or more understudied NZ plant species and convert it into complementary single-stranded DNA (cDNA). The resulting cDNA libraries will be sequenced and characterized by undergraduate students enrolled in our final year molecular science paper (BIOSCI350). The project will advance our understanding of eukaryotic gene splicing and provide an opportunity to acquire some foundational skills in molecular biology.	

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2026/2027 Projects (School of Biological Sciences)



Titoki, circa 1885, New Zealand, by Sarah Featon. Purchased 1919. Te Papa (1992-0035-2277/84)

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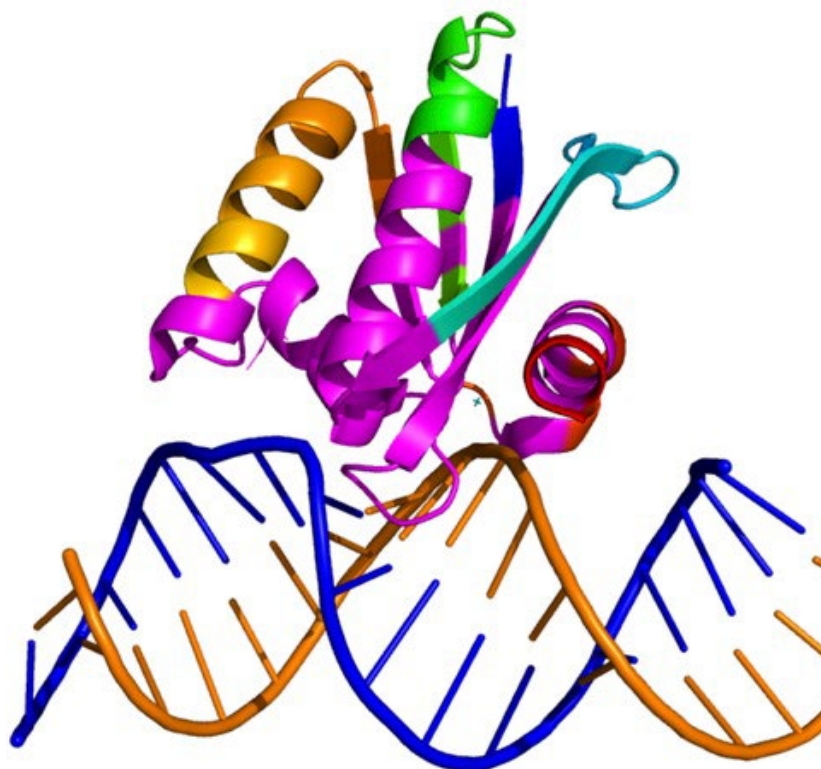
2026/2027 Projects (School of Biological Sciences)

Project code:	SCI049
Project title:	Microbial indicators of soil health and production potential
Discipline:	School of Biological Sciences
Supervisor(s)	Prof Gavin Lear
Contact details	g.lear@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• A basic understanding and interest in the analysis and interpretation of molecular microbial data
Project description <p>Microbial communities are vital determinants of soil and plant health. The Lear Lab has substantial expertise in the analysis of complex microbial community data to assess and even score soil health and production potential through the analysis of microbial DNA. Your project will contribute to our extensive body of research, with the overall aim of identifying specific microbial DNA markers of soil functioning (e.g. relating to soil CO₂ or N₂O emissions). As part of this project you will extract, amplify and process soil microbial DNA collected in partnership with councils and land managers across Aotearoa, contributing fundamental knowledge to allow future land users to better protect and manage our valuable soil resource.</p>	

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI050
Project title:	Searching for new antibiotics
Discipline:	School of Biological Sciences
Supervisor(s)	Assoc Prof Shaun Lott
Contact details	s.lott@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• A strong interest in protein structure and function and/or microbiology and/or drug development• Completion of BIOSCI 350 would be an advantage but not a necessity
Project description <p>Resistance to antibiotics is a growing global problem that is estimated will endanger 10 million lives per year by 2050 without action. This project will focus on understanding an enzyme (RNase HI) that is a target for new antibiotics against the bacterium <i>Neisseria gonorrhoeae</i>, which causes gonorrhoea and is increasingly becoming resistant to current antibiotic therapies. RNase HI activity is essential in the cell to digest the RNA:DNA hybrids called R-loops that can occur as errors during transcription, and inhibiting that activity is cell lethal. We have identified a number of chemical compounds that inhibit RNase HI that could be the basis for new antibiotics. This project will involve testing the activity of those compounds using enzyme assays and visualising how they bind to the RNase HI enzyme using X-ray crystallography and/or NMR spectroscopy.</p>	

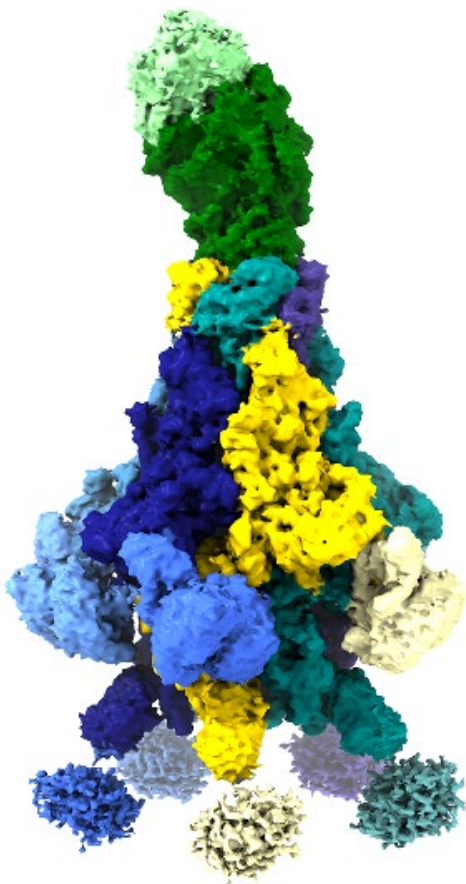


RNase HI, a target for new antibiotics

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI051
Project title:	Engineering bacterial toxins as human cancer therapeutics
Discipline:	School of Biological Sciences
Supervisor(s)	Assoc Prof Shaun Lott
Contact details	s.lott@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• A strong interest in protein structure and function and/or protein engineering• Completion of BIOSCI 350 would be an advantage but not a necessity
Project description ABC toxin complexes (Tcs) are secreted bacterial protein assemblies that contain three main protein components (TcA, TcB, TcC) and two accessory chitinase enzymes. The ABC toxins are normally active against their target insect species. The specificity of their cell surface binding is encoded by one of the chitinase enzymes, which functions to bind cell-specific surface glycans. This project aims to engineer ABC toxin complexes in order to recognise cell surface cancer markers instead of their usual target. The end result will be to make designer protein delivery nanomachines, capable of delivering toxic proteins into targeted eukaryotic cells of our choice, with the overall aim of producing a novel cancer therapeutic.	



Cryo-EM map of the *Yersinia entomopahaga* ABC toxin complex

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI052
Project title:	Beyond the label: Analysis of quetiapine use in Aotearoa New Zealand
Discipline:	School of Biological Sciences
Supervisor(s)	Dr Ibrahim Mohamed Prof Jennifer Miles-Chan
Contact details	ibrahim.mohamed@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Interest in public health, epidemiology, or health data research• Basic data analysis skills (experience with R and/or GraphPad Prism highly regarded)• Ability to interpret and summarise scientific literature
Project description <p>Quetiapine is the most widely prescribed antipsychotic medication in New Zealand, but its use has expanded beyond its original purpose. Why is this happening, and who is affected?</p> <p>Research suggests quetiapine is often prescribed “off-label” for conditions such as sleep problems, anxiety, and mood disorders. However, a clear national picture of how it is used across Aotearoa New Zealand is currently lacking.</p> <p>In this summer project, you will work with real-world healthcare data to explore prescribing patterns at a national level. You’ll investigate how use has changed over time and how it varies across population groups (e.g. age, ethnicity, gender, region, and socioeconomic background).</p> <p>This is a great opportunity to gain experience working with large health datasets and develop skills in data analysis and critical thinking. You’ll contribute to research exploring how medicines are used in everyday clinical practice.</p> <p>Who should apply?</p> <p>Students interested in health sciences, public health, data science, or health equity. Curiosity, attention to detail, and an interest in real-world healthcare are key.</p> <p>Why this project matters</p> <p>Understanding how medications are used in real-world settings helps build a clearer picture of healthcare across communities in New Zealand.</p>	

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Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI053
Project title:	Curation of the McGregor Museum specimens
Discipline:	School of Biological Sciences
Supervisor(s)	Dr Dave Seldon
Contact details	d.seldon@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Databasing• Taxonomic referencing techniques• Taxonomic organisation• Experience with ethanol specimens
Project description <p>A significant number of McGregor Museum specimens are lacking any form of providence, i.e., no locality, collector, time of collection, and specifically no identification. The specimens within the display cabinets in the teaching rooms: Mac 1, Mac 2 and Mac 3 are the tip of the iceberg in terms of numbers.</p> <p>There are also two storage rooms, one dedicated to dry specimens and one for wet specimens that require sorting, databasing and in some cases restoration. Therefore, you will be working with a range of different preserved animal specimens, focussing on:</p> <ol style="list-style-type: none">1. Inspecting for any damage (e.g., insect, breakages), fluid evaporation, etc.2. Name/locality information.3. If no label information, then trying to identify.4. Updating taxonomy.5. Databasing specimens. <p>McGregor Museum history: https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/university-history/our-research-history/mcgregor-museum.html</p>	



McGregor Museum specimens on display in the Thomas Building

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI054
Project title:	Urban birds: are they spreading weeds?
Discipline:	School of Biological Sciences
Supervisor(s)	Prof Margaret Stanley
Contact details	mc.stanley@auckland.ac.nz
Skills Needed	<ul style="list-style-type: none">• Must have driver's licence (preferably full) and access to a car• Ability to do fieldwork
Project description	
<p>This project continues some of our research on urban bird communities and their interaction with exotic plants. The project may include seed collection and identification, some weed surveys, seed trap servicing and some GIS mapping. You will work as part of a team with our postgraduate students studying weeds and urban ecosystems in a high functioning lab group.</p> <p>Some lab and some fieldwork.</p>	



A seed trap to catch seeds deposited by birds

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI055
Project title:	Urban ecology
Discipline:	School of Biological Sciences
Supervisor(s)	Prof Margaret Stanley
Contact details	
Skills Needed	<ul style="list-style-type: none">• Must have driver's licence (preferably full) and access to a car• Ability to do fieldwork
Project description <p>This project will primarily be investigating threats to urban ecosystems, primarily emerging weeds. However, assessment of urban parks may form part of this project, with a potential opportunity to do some bird surveys as part of this project. The project will primarily focus on field work, primarily vegetation surveys, potentially with some lab or shadehouse work. You will work as part of a team with our postgraduate students studying weeds and urban ecosystems in a high functioning lab group.</p>	



Urban weeds in Auckland

Faculty of Science

Summer Research Scholarships

2026/2027 Projects (School of Biological Sciences)

Project code:	SCI056
Project title:	All things Fungi: learning about mycology and plant pathology in a nationally significant fungarium
Discipline:	Bioeconomy Science Institute—Manaaki Whenua Group
Supervisor(s)	Dr Mahajabeen Padamsee Adrienne Stanton
Contact details	padamseem@landcareresearch.co.nz
Skills Needed	<ul style="list-style-type: none">• Attention to detail• Ability to keyboard accurately• A general interest in fungi, bacteriology or plant pathology
Project description: The New Zealand Fungarium is the largest collection of dried fungi in New Zealand, and delivers data associated with the collections through the BiotaNZ website. The two successful applicants will provide assistance adding data to the fungal database, and maintaining, tracking, and storing fungal specimens and cultures and associated DNA sequence data. You will gain an understanding of the day to day running of a mycological research laboratory and key techniques you will learn include handling fungarium specimens, data capture and management, and microscopy. In addition, you will be expected to assist with ongoing projects in the mycology labs at Manaaki Whenua-Landcare Research, Tamaki. These could potentially involve culturing and identification of fungi from field samples, analysis of DNA data, etc.	



Entoloma hochstetteri (blue pinkgill / werewere-kōkako)

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2026/2027 Projects (School of Biological Sciences)

Project code:	SCI057
Project title:	Biodiversity of insects in a taxonomic collection at Landcare Research
Discipline:	School of Biological Sciences and Bioeconomy Science Institute— Manaaki Whenua Group
Supervisor(s)	Assoc Prof Darren Ward
Contact details	wardda@landcareresearch.co.nz
Skills Needed	<ul style="list-style-type: none">• Applicants should have an interest in Entomology, Taxonomy, Natural History• Ability to work in a group or independently, position requires dexterity, care and attention to detail, data entry
Project description Two positions are available based at Manaaki Whenua-Landcare Research, Tamaki, to work with entomologists and taxonomists on insect projects from New Zealand and the Pacific. Learn research and technical skills that will allow you to work in a taxonomic collection or natural science museum, including: 1) fieldwork and sorting field samples, 2) curation and identification of insect groups, 3) imaging specimens for automated identification (machine learning / AI), 4) Databasing and geo-referencing specimens for biodiversity and biosecurity research projects.	