



Protein Chemistry

Teacher Information Booklet

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About Us

About the Perkins

The Harry Perkins Institute of Medical Research, commonly known as The Perkins, is the largest medical research institute in WA working on diseases affecting adults in the community.

With over 250 researchers located in three hospital campuses, the Perkins is uniquely positioned to fast track the development of new discoveries and treatments. Researchers at the Perkins are driven to find new ways of diagnosing and treating diseases.

About the Lotterywest BioDiscovery Centre

The Lotterywest BioDiscovery Centre connects students, teachers, and members of the community to the world of medical science and the research happening at the Perkins. Through school visits, community tours, and teacher professional learning opportunities, we are invested in raising awareness of the importance of medical research.

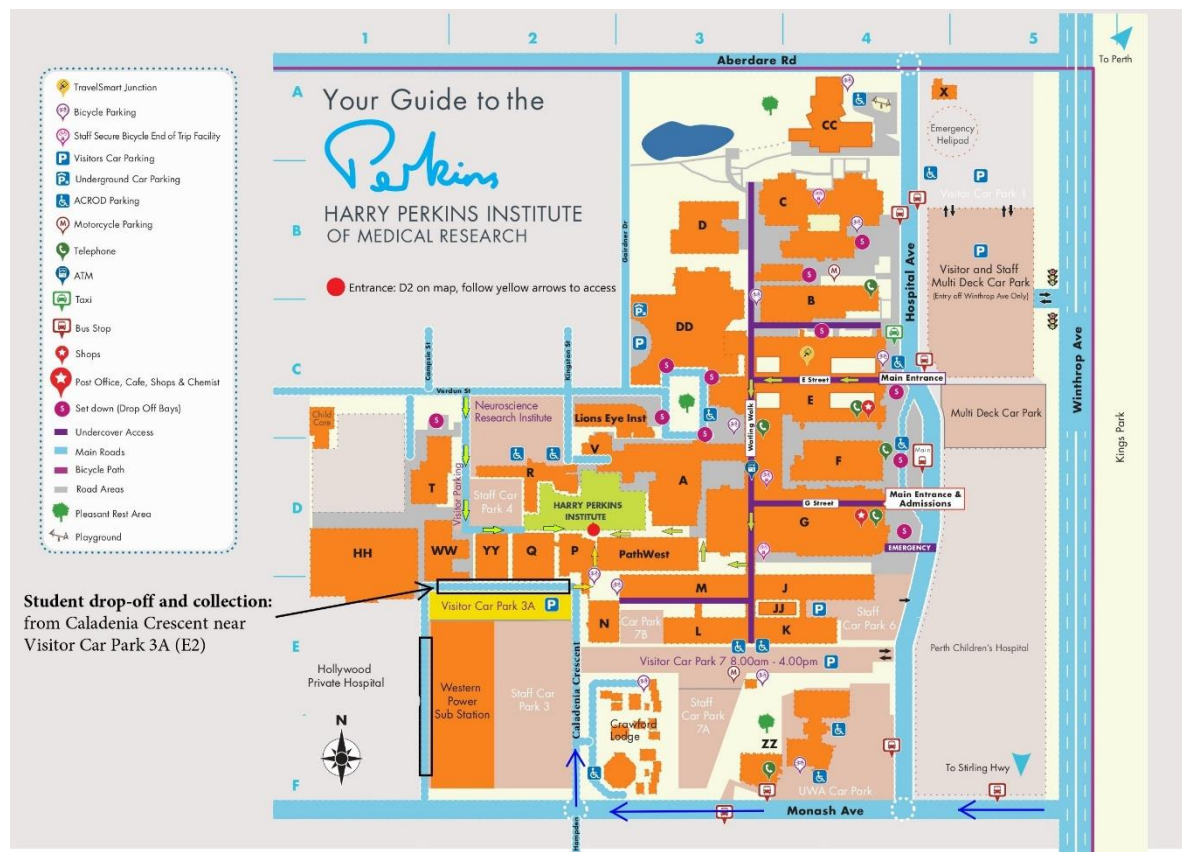
Where to find us

We are located in **Nedlands** at 6 Verdun St, 6009. See the green building on the map below.

Bus parking

Bus parking is organized through QEII parking. Should you require to park your school bus for the day please contact: Nicolette.Staal@health.wa.gov.au and Qeii.parking@health.wa.gov.au

Or alternatively, call on: (08) 6457 7248



About Your Session – Protein Chemistry

Protein Research at the Perkins

Research at the Perkins is looking at proteins through the lens of Synthetic Biology. Synthetic Biology is a new field in research, combining biological science with engineering to redesign parts of biological systems (like DNA or proteins) to function in novel ways. For example, genetically engineered organisms such as bacteria and yeast can be “put to work” doing things that would traditionally be done by machines or even humans, such as synthesising chemicals. Researchers can program cells to detect the presence of specific substances, act as logic gates in “biocomputers”, or synthesise chemicals never seen in nature!

Professor Oliver Rackham leads the **Synthetic Biology and Drug Discovery lab** at the Perkins. “Drug discovery” refers to the process of discovering or designing new molecules that have therapeutic properties.

The lab’s research has a particular focus on antibiotic resistance – a growing public health problem that threatens to undo centuries of medical progress. Antibiotics are a crucial part of what makes modern medicine, such as surgery, possible. Without effective antibiotics, much of the modern medicine we take for granted will become unviable.

In collaboration with the School of Molecular Sciences at the University of Western Australia, Perkins researchers engineered bakers’ yeast to study how some proteins destroy antibiotics. Researchers are also currently working on developing yeast that will produce new antibiotics.

For more information about **Professor Rackham’s** research, check out our website:

<https://perkins.org.au/research/labs/genome-biology-genetics-program/synthetic-biology-and-drug-discovery-overview/>

What this session covers

Students spend the session exploring the primary, secondary and tertiary structures of proteins along with the formation of zwitterions and the role of functional groups.

They will then head to the lab for an investigation of antibiotic-resistance proteins. Using their chemical calculation skills and an electrolytic cell, students will carry out protein gel electrophoresis. Replicating the process research scientists use, students will apply their analytical skills to search the Protein Data Bank for key information about their sample. Using this information, students will then propose modifications to the structure of the protein to see if they can transform it into a more effective antibiotic.

Curriculum links	
Chemistry: Year 12, Unit 4 Organic Chemistry and Chemical Synthesis	
Science Understanding:	Science as a Human Endeavour:
α -amino acid structure – primary, secondary and tertiary; peptides.	Protein Data Bank

Booking Information

Price

Visits are priced at \$50 per student for a group of 20 or more students. For a group of less than 20 students per day, a minimum fee of \$1000 applies. If this is an issue for you please contact us to discuss how we may be able to assist by linking you in with another school.

For bookings over multiple days, each day will be priced independently.

Booking Fee

Once we receive your online booking form, you will be invoiced for our \$100 per session booking fee to confirm your place. This will be deducted from your final invoice.

Numbers

At the time of making your booking, please provide an estimate of the number of students that will be attending. You will be emailed a reminder two weeks before your visit to confirm student numbers.

It is the responsibility of the organizing teacher to confirm final numbers at least one week prior to their booking. A decrease in the number of participants will not be accepted after this point and schools will be invoiced accordingly.

Photo Consent Policy

The Harry Perkins Institute of Medical Research may use photos taken during the session for publicity purposes unless otherwise agreed upon. The onus is on the school to obtain permission for students to be photographed.

Timing

Sessions run from 9:30 to 2:30. Alternative times must be arranged ahead of the session.

Cancellation Policy

If a school cancels less than a month out, the \$100 booking fee is not refundable.

The Lotterywest BioDiscovery Centre at the Harry Perkins Institute for Medical Research requests one month's notice for the cancellation of a school's booking. If this notice is not given, the school will be charged at 50% of the original cost of the excursion or session. It is the responsibility of the organizing teacher to confirm final numbers one week prior to their booking.

Shared Classes

If the total number of students in a shared class drops below 20, all schools attending that day will split the \$1000 minimum fee proportionally to the number students attending.

Duty of Care

School staff are to remain with students at all times. External providers do not have the same special duty of care relationship with students and are not responsible for personally caring for students. Should there be any attendee with a medical condition, disability, mobility issue or special learning requirements, the school is required to attend with two adults who can accept responsibility for duty of care.

On the Day

What teachers need to do and bring

Due to the evolving COVID-19 situation, we have a number of safekeeping measures in place at the Perkins. **Please ensure that the organising teacher has returned a signed COVID-19 form PRIOR to the schools' visit.** On the day, please provide a class list for us to collect at the start of the session. The café is not open to school groups at present. All participants, including teachers, must bring their own lunches, drinks, and snacks.

What your students need to bring

Students will need to bring their own food and drink. Pens and workbooks are provided.

PC2 Rules

All teachers and students must abide by PC2 (Physical Containment level 2) rules to be able to enter the lab. This means:

- 🔹 Flat, fully enclosed shoes (sneakers or leather lace-up school shoes).
- 🔹 All hair and fringes tied back and off faces.

No phones, bags, food or drink (including water) are to be brought into the PC2 lab area

Pre-Visit Checklist

- All organising teachers have completed and returned a COVID-19 Form PRIOR to the school attending
- A class list is prepared for our staff to collect
- All students and teachers have brought lunch, drinks and snacks
- All students and teachers are wearing appropriate footwear and have hair tied back
- No attendee is displaying cough, cold, or flu-like symptoms
- No attendee has been identified as a close contact or is awaiting the results of a COVID 19 test

Working With Children Check Confirmation

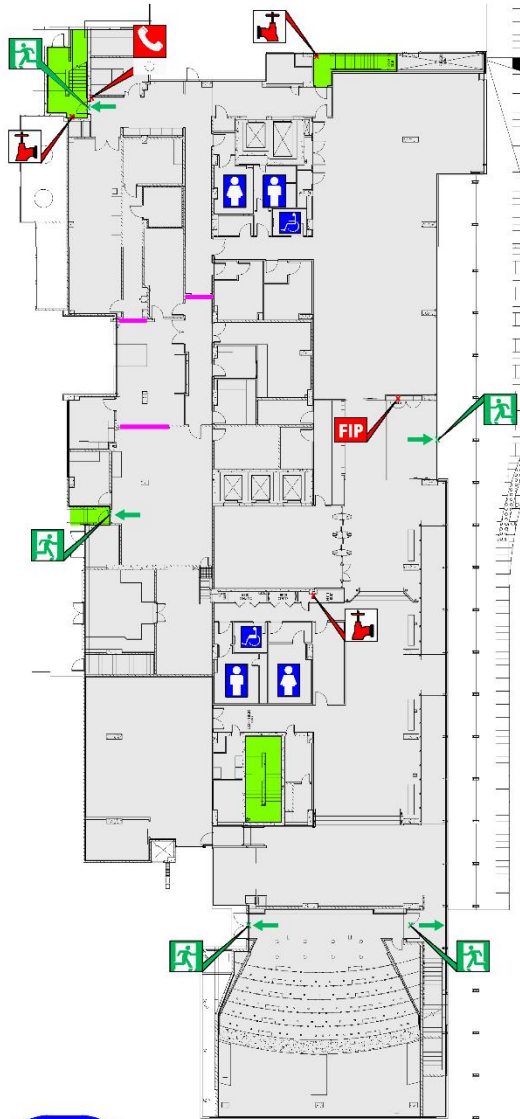
It is a condition of employment at the Lotterywest BioDiscovery Centre that all staff have a current Working With Children card



Judi Lane
Community Education Manager
Lotterywest BioDiscovery Centre
Harry Perkins Institute of Medical Research

Evacuation Map: Ground Floor

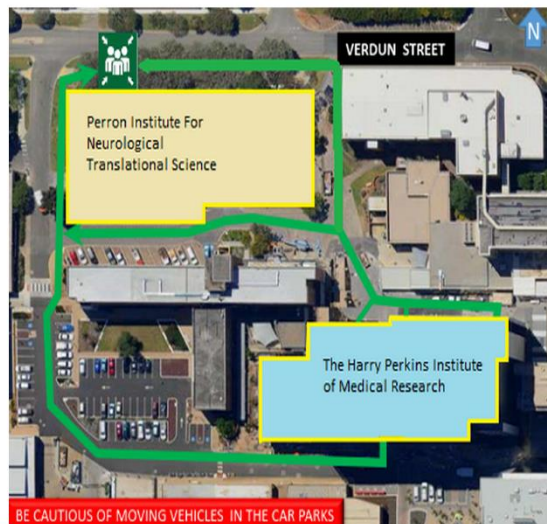
EMERGENCY EVACUATION DIAGRAM QE II PERKINS INSTITUTE GROUND



- 1** When the **ALERT ALARM (Beep, Beep, Beep)** sounds, Stop what you are doing and prepare for evacuation. Listen for instructions. Follow directions from your warden.
- 2** When the **EVACUATE tone (Whoop, Whoop, Whoop) Sound**, under the instruction of the Wardens evacuate the building via the Emergency Exit. If no wardens are present, evacuate the building immediately via your nearest exit.
- 3** Do not panic. Move quietly and calmly to the primary **Assembly Area** on the **footpath in Verdun Street**.
- 4** Do not return to the building until given the "All Clear" by the Chief Warden or Emergency Services.

LEGEND

	Fire Indicator Panel
	W.I.P.
	Fire Hydrant
	Emergency Alarm Button
	Emergency exit
	Assembly Area
	Fire isolation roller doors



ISSUE DATE NOVEMBER 2013
VALID DATE: NOVEMBER 2022

Issued in compliance
With AS3745-2010

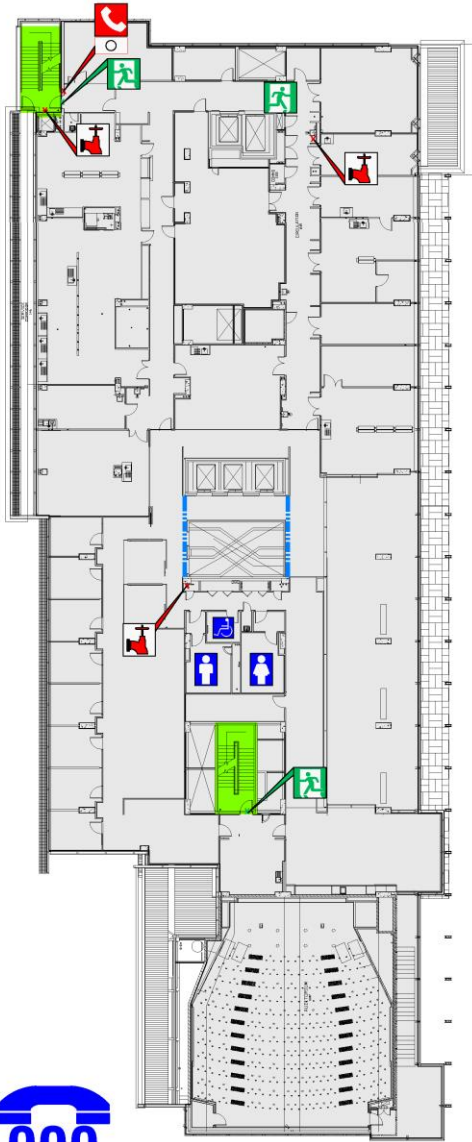
IN THE EVENT OF A FIRE RING 000 TO ENSURE FIRE SERVICE RESPONSE



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Evacuation Map: Level 1

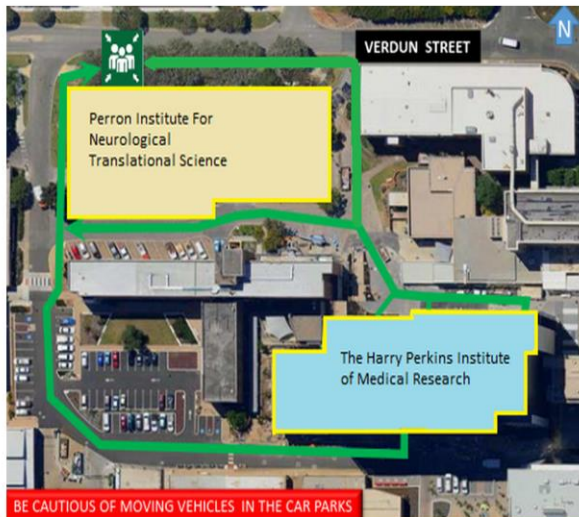
EMERGENCY EVACUATION DIAGRAM QE II PERKINS INSTITUTE LEVEL 1



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LEGEND

	W.I.P
	Fire Hydrant
	Emergency Alarm Button
	Emergency exit
	Assembly Area
	Fire Curtin



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