



Australia's  
Global  
University

Faculty of Medicine  
School of Medical Sciences

# PHAR3202

## Neuropharmacology

COURSE OUTLINE

TERM 2, 2019

CRICOS Provider Code 00098G

<b>OBJECTIVES OF THE COURSE .....</b>	<b>1</b>
<b>COURSE CO-ORDINATOR and LECTURERS .....</b>	<b>1</b>
<b>COURSE STRUCTURE and TEACHING STRATEGIES .....</b>	<b>2</b>
<b>APPROACH TO LEARNING AND TEACHING .....</b>	<b>2</b>
<b>TEXTBOOKS AND OTHER RESOURCES.....</b>	<b>2</b>
<b>STUDENT LEARNING OUTCOMES.....</b>	<b>3</b>
<b>COURSE EVALUATION AND DEVELOPMENT .....</b>	<b>4</b>
<b>ASSESSMENT PROCEDURES .....</b>	<b>4</b>
<b>GENERAL INFORMATION .....</b>	<b>5</b>
Attendance Requirements .....	5
Practical Classes.....	6
Special Consideration .....	6
Student Support Services .....	6
Academic Integrity and Plagiarism.....	6
<b>LECTURE OUTLINES .....</b>	<b>7</b>
<b>TIMETABLE .....</b>	<b>10</b>
<b>ASSESSMENT TASKS .....</b>	<b>11</b>

Please read this manual/outline in conjunction with the following pages on the [School of Medical Sciences website](#):

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at [medicallsciences.med.unsw.edu.au](http://medicallsciences.med.unsw.edu.au) )

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## PHAR3202 Course Information

Neuropharmacology (PHAR3202) is a 3<sup>rd</sup> year Science Course worth Six Units of Credit (6 UOC). The course will build on the information you have gained in Pharmacology (PHAR2011) and Physiology (2101 & 2201) as well as Biochemistry (BIOC2101/2181), Molecular Biology (2201/2291), Chemistry (2021/2041) or Neuroscience Fundamentals (NEUR2201).

### OBJECTIVES OF THE COURSE

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Building on basic pharmacology skills learned in PHAR2011, the objectives of this course are to a) provide both knowledge and conceptual understanding of the use and action of various classes of drugs in the treatment of different human diseases affecting the brain and b) develop an appreciation of the need for further research to identify new drug targets for more effective therapies.

### COURSE COORDINATOR and LECTURERS

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Course Coordinator:

Dr Nicole Jones

Room 327, Wallace Wurth Building East

Ph: 9385 2568

[n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au)

Co-Coordinator:

Dr Natasha Kumar

Room 325, Wallace Wurth Building East

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[natasha.kumar@unsw.edu.au](mailto:natasha.kumar@unsw.edu.au)

Students wishing to see the course coordinators should make an appointment *via* email as our offices are not readily accessible. We will organize to meet you in a convenient location elsewhere in the building.

Lecturers in the course:

Dr Trudie Binder

[w.binder@unsw.edu.au](mailto:w.binder@unsw.edu.au)

A Prof Kay Double

[kay.double@sydney.edu.au](mailto:kay.double@sydney.edu.au)

Prof Margaret Morris

[m.morris@unsw.edu.au](mailto:m.morris@unsw.edu.au)

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## **COURSE STRUCTURE and TEACHING STRATEGIES**

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Learning activities occur on the following days and times:

- Lectures: Wednesday 1-2pm, Thursday 11-12 pm
- Tutorials: Wednesday 2-3pm, 3-4pm, 4-5pm \*
- Practicals: Friday 10am-1pm or 2-5 pm\*

\* Once enrolled in any of these sessions, students cannot change.

Students are expected to attend all scheduled activities for their full duration (2 hours of lectures per week and up to 4 hours of practical and tutorials per week). Students are reminded that UNSW recommends that a 6 units-of-credit course should involve about 150 hours of study and learning activities. The formal learning activities are approximately 72 hours throughout the term and students are expected (and strongly recommended) to do at least the same number of hours of additional study.

Lectures will provide you with the concepts and theory essential for understanding the mechanism of action and clinical effects of drug classes which are used to treat CNS disorders. For each disease the pathological process will be outlined in the lecture and the relevant drug targets in the disease process identified and current pharmacological treatments will be described. While lectures will focus on the mechanism of action and adverse effects of drugs currently in use, potential new therapies, drug targets and areas requiring further research for more effective therapies, will be identified and discussed.

To assist in the development of research and analytical skills practical classes and tutorials will be held. These classes and tutorials allow students to engage in a more interactive form of learning than is possible in the lectures. The skills you will learn in practical classes and tutorials are relevant to your development as professional scientists.

## **APPROACH TO LEARNING AND TEACHING**

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The learning and teaching philosophy underpinning this course is centred on student learning and aims to create an environment, which interests, challenges and enthuses students. The teaching is designed to be relevant and engaging in order to prepare students for future careers.

Although the primary source of information for this course is the lecture material, effective learning can be enhanced through self-directed use of other resources such as textbooks and Web based sources. Your practical classes will be directly related to the lectures and it is essential to prepare for practical classes before attendance. It is up to you to ensure you perform well in each part of the course; preparing for classes; completing assignments; studying for exams and seeking assistance to clarify your understanding.

## **TEXTBOOKS AND OTHER RESOURCES**

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These resources will take the form of text books, journal articles or web-based resources. If available, links to the electronic form of these resources will be put on the course Moodle page.

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**Recommended Primary Text:**

- Nestler, Hyman, Holtzman and Malenka; Molecular Neuropharmacology: A Foundation for Clinical Neuroscience. 3rd Edition McGraw Hill, 2015. This book is available for purchase through the UNSW bookshop and there will be a copy available in the UNSW library.

**Additional reading suitable as Secondary Resources:**

- Rang, Dale, Ritter Flower and Henderson; “Rang and Dale’s” Pharmacology 7<sup>th</sup> Edition. Elsevier, Churchill Livingstone, 2012. This textbook is available from the UNSW bookshop and there are copies available in the UNSW library
- Brunton, Lazo and Parker; Goodman and Gilman’s The Pharmacological basis of therapeutics. 11<sup>th</sup> Edition. McGraw Hill. There are copies of this textbook and there is also an electronic resource – both are available through the UNSW library.

See also [medalsciences.med.unsw.edu.au/students/undergraduate/learning-resources](http://medalsciences.med.unsw.edu.au/students/undergraduate/learning-resources)

**STUDENT LEARNING OUTCOMES**

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PHAR3202 will develop those attributes that the Faculty of Science has identified as important for a Science Graduate to attain. These include; skills, qualities, understanding and attitudes that promote lifelong learning that students should acquire during their university experience.

**Graduate Attributes**

- A. Research, inquiry and analytical thinking abilities
- B. The capability and motivation for intellectual development
- C. Ethical, social and professional understanding
- D. Effective communication
- E. Teamwork, collaborative and management skills
- F. Information Literacy – the skills to locate, evaluate and use relevant information.

**Pharmacology Major Learning Outcomes**

1. Demonstrate an understanding of how drugs/therapeutics are developed, work and are used safely.
2. Critically analyse, interpret and effectively communicate pharmacology data and literature.
3. Design and/or execute experiments or other activities to address pharmacological scenarios.

**PHAR3202 Learning Outcomes**

On completion of this course students should be able to:

- describe the synthetic and metabolic pathways and functions of the major CNS neurotransmitters
  - describe the mechanism of action of specified drug classes used to treat the major types of brain and mind disorders
  - generate, analyse and interpret neuropharmacology data
  - apply knowledge of neuropharmacology techniques and theory to design experiments and test hypotheses
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- demonstrate the ability to work in teams and communicate scientific information effectively to a variety of audiences and in a variety of formats

## **COURSE EVALUATION AND DEVELOPMENT**

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For course evaluation, feedback has been gathered at the completion of the course, using among other means, UNSW's Course and Teaching Evaluation and Improvement Process and myExperience. Student feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback. Also a staff-student liaison group will be set up and students will be invited to become class representatives to seek feedback from their colleagues and meet with academic staff to discuss any issues that arise.

Based on student feedback received 2015-2018, the following changes have been made: the student assignment and has now been allocated a larger proportion of the total assessment marks from 17.5% to 20%, and includes a reflective process (blog) related to group work. The tissue culture practical class is modified and an accompanying tutorial has been added, to allow students a chance to research and design their own neuroprotection experiment (within class time and resource constraints). Time to work on group assignments has been allocated within prac class sessions. There are 2 new online tutorials which will be devoted to revision questions. The weighting of the final exam mark has been reduced from 60% to 55%.

## **ASSESSMENT PROCEDURES**

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|--|------------|
| • Progress exam (40 min duration)                                | <b>15%</b> |
| • Practical Quizzes (4 in total throughout term)                 | <b>10%</b> |
| • Assignment "Controversial Research Topic in Neuropharmacology" | <b>20%</b> |
| ○ Debate presentation (12.5%)                                    |            |
| ○ Synopsis (5%)  |            |
| ○ Teamwork blog (2.5%)   |            |
| • End of session examination (2 hours duration)                  | <b>55%</b> |

A penalty will apply for late submissions of assessment tasks (10% per day).

The *progress examination* will be held during the lecture session (July 11<sup>th</sup>) in week 6. This exam will give you feedback on how you are progressing in the course. The *progress examination* and *end of session examination* will test not only your knowledge of drugs used to treat major classes of brain and mind disorders but also your ability to apply the knowledge you have acquired from multiple lectures. The progress examination will be in the form of multiple choice and short answer questions. The questions will be based on the material covered in the lectures, practical classes and tutorials. Material covered prior to the progress exam may be again examined in the final exam. These exams will address graduate attributes A and B. The end of session examination will be held during the official examination period.

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## GENERAL INFORMATION

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The Department of Pharmacology is part of the School of Medical Sciences and is within the Faculty of Medicine. It is located in the Wallace Wurth building.

**Professor Margaret Morris** is Head of Department and appointments to meet with her may be made via email ([m.morris@unsw.edu.au](mailto:m.morris@unsw.edu.au)).

**There are two honours programs run through the School.** The SoMS Honours program is coordinated by Dr Cristan Herbert ([c.herbert@unsw.edu.au](mailto:c.herbert@unsw.edu.au)), Ph: 9385 8679, and Neuroscience Honours program is coordinated by Dr Natasha Kumar ([natasha.kumar@unsw.edu.au](mailto:natasha.kumar@unsw.edu.au)), Ph: 9385 1713. Honours Administrator: Vicky Sawatt ([v.sawatt@unsw.edu.au](mailto:v.sawatt@unsw.edu.au)), Ph:9385 8195. Any students considering an Honours year should discuss the requirements with the coordinators.

### **Postgraduate degrees**

The Department of Pharmacology offers students the opportunity to enter the following graduate programs:

**Course Work Masters:** Masters in Pharmaceutical Medicine. For more information contact A/Prof Orin Chisholm ([o.chisholm@unsw.edu.au](mailto:o.chisholm@unsw.edu.au))

**Research Masters:** In Pharmacology. Contact the post-graduate co-ordinators A/Prof Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)) and Dr Nicole Jones ([n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au))

**Doctorate (Ph.D):** In Pharmacology. Contact the post-graduate co-ordinators A/Prof Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)) and Dr Nicole Jones ([n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au))

### **Enrolment and administrative help**

The Education Support Team is available to help with problems with enrolment and scheduling, and should be the first point of contact for administrative problems. Please contact them via student portal: <http://unsw.to/webforms>.

### **Attendance Requirements**

For details on the Policy on Class Attendance and Absence see [Advice for Students](#) and the [Policy on Class Attendance and Absence](#).

Guidelines on extra-curricular activities affecting attendance can be found on the School of Medical sciences Website. [Advice for Students – Special Consideration](#)

Attendance at practical classes is compulsory, and must be recorded in the class roll at the start of each class. Arrival more than 15 minutes after the start of the class will be recorded as non-attendance. It is your responsibility to ensure that the demonstrator records your attendance and no discussions will be entered into after the completion of the class. Satisfactory completion of the work set for each class is essential. It should be noted that non-attendance for other than documented medical or other serious reasons, or unsatisfactory performance, for more than 1 practical class during the session may result in an additional practical assessment exam or ineligibility to pass the course. Students who miss practical classes due to illness or for other reasons must submit a copy of medical certificates or other documentation to the course coordinator.

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## Practical Classes

The practical class is an opportunity for students to develop graduate attribute C by behaving in an ethical, socially responsible and professional manner within the practical class. Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. In the interests of safety, special attention should be paid to any precautionary measures recommended in the notes. If any accidents or incidents occur they should be reported immediately to the demonstrator in charge of the class who will record the incident and recommend what further action is required.

For more details see [Advice for Students-Practical Classes](#)

## Special Consideration

You can apply for special consideration when illness or other circumstances beyond your control interfere with your assessment performance. Please see [UNSW-Special Consideration](#) and [Student Advice-Special Consideration](#) to find out more about it.

**The application for all special consideration regardless of the percentage of the final grade it contributes must be made through Online Services in myUNSW** (My Student Profile tab > My Student Services > Online Services > Special Consideration).

If your request for consideration is granted an alternative assessment will be organised which may take the form of a supplementary exam or increased weighting of the final exam.

## Student Support Services

See: [Student Advice-Student support services](#).

## Academic Integrity and Plagiarism

The [UNSW Student Code](#) outlines the standard of conduct expected of students with respect to their academic integrity and plagiarism.

More details of what constitutes plagiarism can be found [here](#)

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## LECTURE OUTLINES

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The course timetable is appended at the end of these notes and can also be found on Moodle.

The course is divided into 5 main themes covering different aspects of Neuropharmacology

1. Introduction to neuropharmacology
2. Neurotransmitter and receptor systems in the brain
3. Brain disorders – and drugs used to treat them
4. Analgesics and anaesthetics
5. Neurodevelopment and blood brain barrier

### **1. Introduction to Neuropharmacology**

This lecture will provide an introduction to neuropharmacology - the study of drugs that affect the brain. It will briefly review the way that nerve cells communicate to each other via chemicals and receptors and provide an overview of the variety of different chemicals and receptors utilized and the nerve pathways and neuronal functions associated with different neurotransmitter systems.

### **2. Neurotransmitter and Receptor systems in the brain**

#### **Serotonin / Noradrenaline**

This lecture will cover the mechanisms involved in synthesis and metabolism of serotonin and noradrenaline. Principle serotonergic and noradrenergic pathways in the CNS. Agonists and antagonists at receptors. Provide a general overview of therapeutic uses of drugs affecting 5HT, NA systems in the CNS.

#### **Acetylcholine / Dopamine**

This lecture will cover basic aspects of acetylcholine synthesis, storage and release. Nicotinic and muscarinic receptors in the brain and drugs which mediate cholinergic transmission in the CNS. An overview of cholinergic drugs used to treat CNS conditions. This lecture will cover pathways involved in dopamine synthesis and metabolism. Provide an overview of functional aspects of dopaminergic pathways in the brain (including motor control and behaviour). Pharmacology of drugs affecting dopamine; important adverse reactions to dopamine antagonists including the underlying mechanisms; selectivity of dopamine antagonists; types of dopamine receptors in the brain. Provide a brief summary of dopaminergic drugs used to treat brain disorders.

#### **Neuropeptides**

This lecture will cover the general characteristics of neuropeptides; how they act as neurotransmitters and neuromodulators; possible roles in modulating CNS functions; specific receptors; agonists and antagonists. Examples: substance P, neuropeptide Y and neurotensin

#### **ATP/NO as neurotransmitters**

ATP as a neurotransmitter; adenosine as a modulator; P1 and P2 classes of purinergic receptors; functional aspects of the receptors; drugs acting on the receptors. Nitric oxide, the

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only neurotransmitter not stored in vesicles; effects of nitric oxide; clinical conditions in which nitric oxide may play a role.

### **Amino Acids**

Glutamate and GABA are amino acids that are key neurotransmitters within the mammalian CNS. This lecture will cover their synthesis and storage, the structure and function of glutamate and GABA receptors *in vivo* and look at some selective glutamatergic and GABAergic drugs.

### **3. Brain disorders – and drugs used to treat them**

#### **Depression**

Monoamine theory of depression; pharmacology of antidepressant drugs (tricyclic antidepressants; monoamine oxidase inhibitors; "atypical" antidepressants); important adverse reactions to these drugs including the underlying mechanisms; mode of action of lithium

#### **Schizophrenia / Neuroleptic Drugs**

Neuroleptic drugs are drugs that are used to treat psychosis such as schizophrenia. This lecture will briefly describe what schizophrenia is and the neuroleptic drugs which are used to treat this disorder. This lecture will also cover the brain and peripheral neurotransmitter receptors which neuroleptic drugs interact with, the proposed mechanism of clinical action and the side effects associated with neuroleptic drug use.

#### **CNS control of Feeding / Obesity**

Obesity is a growing health problem and a major contributor to burden of disease in our society. This lecture will review the physiology of appetite control and the major potential therapeutic targets: fat absorption, food intake and thermogenesis. The mechanism of action of current anti-obesity drugs, their adverse effects, and central signals that are potential new therapies for obesity will be considered.

#### **Drug Addiction / Dependence**

This lecture provides an overview of the effects of chronic drug use on the CNS and the adaptive responses that underlay withdrawal and dependence. Key concepts include drug withdrawal and dependence, synapses and cell signalling and the modulation of neurotransmitters and biochemical pathways contributing to drug addiction. Signalling pathways modulated by drugs of abuse can provide new targets for treating drug addiction.

#### **Motor coordination: Parkinson's disease**

This lecture is an introduction to pharmacological treatments for Parkinson's diseases. Mechanisms of action, efficacy and side-effects of commonly used pharmacological treatments will be considered. Choice of treatment and other treatment issues will also be discussed.

#### **Epilepsy and anticonvulsants**

This lecture will provide an overview of the different types of epilepsy. Anticonvulsant drugs and how they work: (clonazepam, valproate, vigabatrin, phenobarbitone, primidone, phenytoin, carbamazepine, ethosuximide, trimethadione); adverse effects on CNS, blood and other tissues.

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**Sedatives and Hypnotics**

This lecture will provide a brief overview of sleep and anxiety. We will discuss a number of different classes of pharmacological agents that are used to help with these conditions, their mechanism of action and potential side effects.

**Stroke and Neuroprotection**

This lecture will cover the incidence of stroke and the mechanisms involved in brain injury. It will provide an overview of the current therapies used to treat or prevent stroke in humans. There will be a mention of current clinical trials for stroke treatment and models used to identify neuroprotective drug candidates.

**Neurodegeneration**

These lectures will provide an overview of a number of neurodegenerative diseases (e.g. Alzheimer's disease, Amyotrophic lateral sclerosis, Huntington's disease, Parkinson's disease); their pathophysiology, possible novel areas for therapeutic intervention and efficacy of current therapies.

**4. Analgesics / Anaesthetics****Pain and Analgesia in the CNS**

This lecture provides an overview of central nervous system mechanisms of pain and analgesia. It encompasses modulatory mechanisms in nociceptive pathways, neurotransmitters involved in nociception, chemical signalling and the pharmacology of drugs such as opioids which modulate pain.

**Local and General Anaesthetics**

This lecture will provide an overview of the different types of local and general anaesthetic agents. Mechanisms of action of a number of different commonly used anaesthetics. The central nervous system effects; sites of action; adverse effects; effects on axonal and synaptic transmission.

**5. Neurodevelopment and blood brain barrier****Neurodevelopment/Neurotrophic factors**

This lecture will provide an overview of the role of neurotrophic factors in development. Neurotrophic factors, receptors and signaling pathways. Importance of neurotrophic factors as possible therapeutics in degenerative disorders.

**CNS drugs and blood brain barrier**

This lecture will discuss the blood brain barrier and its importance in protecting the brain and regulating the exchange of factors between the blood and brain. One problem facing the design of drugs for CNS disorders is blood brain barrier permeability, in particular large molecules are not able to get into the brain. Novel approaches to deliver agents to the brain will be discussed.

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**TIMETABLE**

<b>Wk</b>	<b>Lecture 1 - Mat D Wed 1-2</b>	<b>Tutorials - Mat 311 Wed 2-3, 3-4, 4-5</b>	<b>Lecture 2 – CLB 1 Thurs 11-12</b>	<b>Practical Class WW120 Fri 10-1, 2-5p</b>	<b>Online Activities</b>	<b>Assessment Tasks</b>
<b>1</b> 3/6	<b>Serotonin / Noradrenaline</b> N. Jones	<b>Summarising Research Articles</b>	<b>Acetylcholine / Dopamine</b> N. Jones	<b>Behavioural Pharmacology Research Debate Topics Distributed</b> N. Jones / N.Kumar	<b>Introduction: Neurochemical transmission and neuromodulation</b> N. Jones	<b>Online Prac Quiz#1</b>
<b>2</b> 10/6	<b>ATP and NO as neurotransmitters</b> N. Kumar	<b>Cutting Edge Research in Neuropharmacology – Animal models</b>	<b>Neuropeptides as transmitters</b> N. Kumar	<b>Animal Handling / Group Work</b> N.Jones / N.Kumar		<b>Blog Post #1 + individual teamwork assessment</b>
<b>3</b> 17/6	<b>Amino Acids – Glutamate</b> N. Jones	<b>CNS Neurotransmitters</b>	<b>Amino Acids –GABA and Glycine</b> J.Carland	<b>Barbiturates</b> T.Binder / N.Jones	<b>Neurotrophic factors</b> N. Jones	<b>Online Prac Quiz#2 Submit Plan for debates</b>
<b>4</b> 24/6	<b>Pain and Analgesia in CNS</b> T. Binder	<b>Cutting Edge Research in Neuropharmacology – Methods to examine neurotransmission</b>	<b>Mood / Psychiatric Disorders I</b> N.Jones	<b>Narcotic analgesics</b> T. Binder / N.Kumar	<b>ONLINE REVISION QUESTIONS</b>	<b>Online Prac Quiz#3 Blog Post #2</b>
<b>5</b> 1/7	<b>Mood / Psychiatric Disorders II</b> N.Jones	<b>Treatments for Mood / Psychiatric Disorders</b>	<b>Drug Addiction / Dependence</b> T. Binder	<b>Detecting neurotransmitters in the brain - Part 1</b> N.Kumar	<b>Case studies – Mood / Psychiatric Disorders</b>	<b>Blog Post #3</b>
<b>6</b> 8/7	<b>CNS control of Breathing / Blood Pressure</b> N. Kumar	<b>Drugs of Addiction</b>	<b>Mid-Session TEST</b>	<b>Detecting neurotransmitters in the brain - Part 2</b> N.Kumar		<b>Blog Post #4</b>
<b>7</b> 15/7	<b>CNS control of Feeding / Obesity</b> M. Morris	<b>NO FORMAL TUTORIAL</b>	<b>Epilepsy and anticonvulsants</b> N. Jones	<b>Zebrafish behaviour</b> N. Kumar/ N.Jones & D. Hesselson		<b>Online Prac Quiz #4</b>
<b>8</b> 22/7	<b>Stroke and Neuroprotection</b> N. Jones	<b>Neuronal toxicity prac preparation</b>	<b>Treatments for Parkinson's disease</b> K.Double	<b>Research Debate Presentations</b> Pharmacology Academics	<b>ONLINE REVISION QUESTIONS</b>	
<b>9</b> 29/7	<b>Neurodegeneration I</b> N.Kumar	<b>Neurodegeneration: Parkinson's disease case study</b> N. Jones / K. Double	<b>Neurodegeneration II</b> N.Kumar	<b>Tissue Culture – neuronal toxicity</b> N.Jones		<b>Debate Synopsis (500 words), Blog Post #5 + Teamwork assessment</b>
<b>10</b> 5/9	<b>General and Local Anaesthetics</b> N. Jones	<b>Treatments for Neurological Disorders</b>	<b>CNS drugs and blood brain barrier</b> N. Jones	<b>Tissue Culture – neuronal toxicity data analysis / Exam Revision Quiz</b> N.Jones	<b>Case studies - Neurodegeneration</b>	

## ASSESSMENT TASKS

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Task	Due Date
Practical Quizzes	Submit prior to 9am on the Monday immediately following the prac class
Mid-Session Test	Thursday 11 <sup>th</sup> July – <b>11-12pm</b>
Research Debate Presentations	Friday 26 <sup>th</sup> July – <b>10-1pm</b> <u>or</u> <b>2-5 pm</b>
Research Debate Synopsis	Friday 2 <sup>nd</sup> August – <b>9am</b>
Final Examination	Official Exam period

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### **Group Assignment Information**

Students will work in teams of 3-4 to research a “Controversial Research Topic in Neuropharmacology”. Each group member must participate in the development of an argument for or against the topic and in the prac class in week 9, groups will debate the topic. Topics will be assigned to groups in the first prac class session. Individual group members will be required to submit a 500-word synopsis of their own debate and research into the topic. This assessment task will allow you to develop your research, information literacy, communication and time management skills, as well as allowing you to demonstrate your ability to work in a team and collaborate successfully. The report must be submitted electronically *via* Moodle, through Turnitin. A penalty will apply for late submissions (10% per day).

**Groups:** Will be assigned in the first prac class session. Each group will be assigned a topic in this class.

**General Instructions:** Groups will need to examine and critically evaluate the available evidence on their topic. They will be required to use available experimental and clinical data in order to reach a conclusion. The validity of the evidence needs to be considered and discussed.

#### **Group Oral presentation (Research Debates) (12.5%)**

- Groups will construct a debate on the assigned topic and prepare a presentation from their research. A powerpoint presentation is required.
- One or more members of the group will give the presentation, while other group members will be required to help with the rebuttal and answer questions following the presentation.
- The oral presentation (per group) will be a maximum of 8 minutes in length and will be followed by a 2 minute rebuttal (per group) and 5 minutes of question time per topic.

#### **Individual Written Synopsis (5%)**

The individual written synopsis should include the following information:

- A brief introduction to the topic and why it is controversial.
- Discuss the pharmacological issues (receptors, drug, side effects, interactions), disease condition, methods used to assess drug efficacy in experimental and clinical studies and how these studies have led to advances in our understanding of a CNS disorder.
- Evaluate the available evidence and reach a conclusion about your research topic.

#### **Group Work Log (2.5%)**

- You will also be required to keep a log of your group work contributions using EPortfolio (this requirement will be further outlined in the First Prac Class).

#### **Overall Assignment Assessment**

- The synopsis, debate and group work log will be worth 20% of your total course grade.
- The oral presentation will be assessed by at least two members of Pharmacology staff and one peer group.

**Research Debates:** will be presented in random order in the prac sessions of week 8.

**Due Date of Individual Written Synopsis:** Friday 2<sup>nd</sup> August – (9am - submitted via Turnitin)

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**DEBATE PRESENTATION: MARKING CRITERIA**

Group: \_\_\_\_\_ Topic: \_\_\_\_\_

Category	Assessment form (Mark out of 10 for each marking criteria)					
	Exemplary (>8.5)	Very Good (8.4-7.5)	Good (7.4-6.5)	Satisfactory (6.4-5.0)	Unacceptable (<5.0)	Total
<b>Introduction and topic info</b>	Highly detailed and focused introduction. All info clear, accurate and thorough	Thorough introduction. Most information presented in this debate was clear, accurate, thorough	Team introduced the subject, but neglected to include some points. Info presented was clear and accurate, but not thorough	Team introduced the subject, but neglected to include many points. Minor inaccuracies or at times unclear	The team does not introduce the subject matter. Major inaccuracies or mostly unclear.	/10
<b>Critical evaluation of the literature</b>	Every major point was clearly supported with relevant facts, statistics and/or examples	Every major point was adequately supported with relevant facts, statistics and/or examples	Every major point was adequately supported with relevant facts, statistics and/or examples but the relevance of some points was questionable	Some points were supported, others were not	Very limited critical analysis of strengths and limitations of the literature, mostly descriptive	/10
<b>Organization, concluding statement to summarise group argument</b>	Clear and concise argument integrated with the literature. Well developed, organised in a tight logical fashion.	Mostly clear description of argument. Well developed, organised in a tight logical fashion.	All arguments were tied to an idea, but the organisation was sometimes not clear, developed or logical	Arguments were not well tied to an idea, and the organisation was sometimes not clear, developed or logical	Arguments lacked in major aspect. Poor links with the literature.	/10
<b>Questions</b>	Team clearly understood all questions and answered appropriately, in depth, convincingly and with ease.	Team clearly understood questions and answered appropriately and convincingly	Team understood most of the questions and answered appropriately and convincingly	Team seemed to understand most of the questions, but presented uneasily or inappropriately	Team did not understand the questions and the answers were inappropriate	/10
<b>Audience Engagement</b>	Team successfully engaged the audience. Consistent use of convincing body language (gestures, eye contact, level of enthusiasm)	Team usually engaged the audience. Consistent use of convincing body language that kept the attention of the audience	Team sometimes used convincing body language that kept the attention of the audience	One or more team members did not keep the attention of the audience	Team presentation style did not engage or keep the attention of the audience.	/10
Total (Mark/50)						/50

**Comments:**

**Strengths:**

**Improvement:**

**Points for clarification (if necessary):**



**INDIVIDUAL WRITTEN SYNOPSIS : MARKING CRITERIA**

Category	Exemplary (>8.5)	Very Good (8.4-7.5)	Good (7.4-6.5)	Satisfactory (6.4-5.0)	Unacceptable (<5.0)
<b>Title &amp; Formatting</b>  ____/10 x 0.5	Title clearly indicates the subject matter of the paper. Name and student number and departmental address given. Word count 500 ± 50	Title indicates the subject matter of the paper. Name and student number and departmental address given. Minor errors in formatting. Word count 500 ± 50	Title indicates the subject matter of the paper. Name and student number and departmental address given. Errors in formatting. Word count 500 ± 50	Title does not indicate the subject matter of the paper. Name and student number and departmental address given. Errors in formatting. Word count >550	Title, author's name and/or address not given. Formatting requirements not followed. Word count >550 or <450.
<b>Introduction</b>  ____/10 x 2.5	Focused introduction to the topic and explanation of the controversy. Concise and clear account of the pharmacological issues, disease condition and methodologies used to assess efficacy.	Introduction to the topic and explanation of the controversy. Clear account of the pharmacological issues, disease condition and methodologies used to assess efficacy. Minor omissions or errors.	Introduction to the topic and some explanation of the controversy. Clear account of the pharmacological issues, disease condition and methodologies used to assess efficacy. A few factual errors or omissions.	Some introduction to the topic and explanation of the controversy. Some of the pharmacological issues, disease condition and methodologies used to assess efficacy are described. More detail needed.	No real introduction to the topic or explanation of the controversy. Some of the issues, disease condition and methodologies used to assess efficacy are mentioned. Lacking detail.
<b>Discussion &amp; Conclusion</b>  ____/10 x 4	Critical evaluation of the issues identified and supported by chosen sources. A well balanced and logical presentation that explores available evidence supporting / against your topic. Re-stated key findings and main conclusions conveyed in a final paragraph.	Critical evaluation of the issues identified and supported by chosen sources. A balanced and logical presentation that explores available evidence supporting / against your topic. Some re-stating of key findings and main conclusions conveyed in a final paragraph.	Some critical evaluation of the issues identified. A mostly balanced and logical presentation that explores available evidence supporting / against your topic. Some re-stating of key findings and conclusions conveyed in a final paragraph.	Some critical evaluation of the issues identified. A mostly balanced and logical presentation that explores available evidence supporting / against your topic. Some errors in interpretation. Some re-stating of key findings and some conclusions conveyed in a final paragraph.	No critical evaluation of the issues identified and supported by chosen sources. No balance or logic to presentation. Main conclusions not conveyed in a final paragraph.
<b>Referencing</b>  ____/10 x 0.5	In-text citations and reference list follow BJP conventions. Relevant information selected. A wide range of references used.	In-text citations and reference list follow BJP conventions. Relevant information selected. A wider range of references needed.	In-text citations and reference list follow BJP conventions, with minor errors. Relevant information selected. A wider range of references needed.	In-text citations and/or reference do not follow BJP conventions. Relevant information selected. A wider range of references needed.	BJP conventions not followed. Non-peer reviewed sources used. Information is not referenced. Wider range of references needed.
<b>Writing Conventions</b>  ____/10 x 2.5	Excellent sentence structure, correct grammar and word usage. Sentences and paragraphs well connected. Appropriate written expression- using discipline specific vocabulary and formal not oral language. Has been proof read.	Very good sentence structure, correct grammar and word usage. Sentences and paragraphs well connected. Appropriate written expression- using discipline specific vocabulary and formal not oral language. Proof reading needed to eliminate minor errors.	Good sentence structure, correct grammar and word usage. Sentences and paragraphs not always well connected. Appropriate written expression- better use of discipline specific vocabulary and formal not oral language needed. Proof reading needed.	Poor sentence structure, grammar and word usage. Sentences and paragraphs not well connected. Appropriate written expression- better use of discipline specific vocabulary and formal not oral language needed. Proof reading needed.	Use of paragraphs and improved sentence structure needed. The report is difficult to read due to poor grammar and word usage. No evidence of proof reading.
<b>TOTAL</b> /100					