

Welcome to your MSc Neuroscience at King's College London

Transitioning to your MSc Neuroscience

Postgraduate Students often need to make various adjustments to successfully navigate the challenges and demands of their MSc Neuroscience. Being aware of these adjustments can help you manage your academic, personal, and professional responsibilities effectively. Here are some adjustments tips that may help you succeed with your MSc:

Postgraduate studies are more intensive than undergraduate studies. This will require strong time management skills. Tip: Create a structured schedule that balances your time for coursework, research, personal activities, and looking after yourself.

You will have multiple responsibilities and will need to learn to prioritise tasks based on urgency and importance. This involves identifying key (sometimes apparently conflicting) deadlines for your assessments, and research goals. You will need to balance these with your teaching and work/life commitments. Tip: Set yourself clear short-term and long-term goals; these can help you stay focussed and motivated throughout the academic year.

As you progress through the year, the 'landscape' (academic or otherwise) can change, and plans may need to be adjusted. You should be prepared to adapt to unexpected challenges. This is similar to carrying out research where you often need to adjust your research focus, or methods based on new findings. Having to consider alternate solutions is not a bad thing and can lead to innovative breakthroughs.

Effective communication with your peers, programme team, and supervisors is important. Consider carefully feedback received from peers, academics, in person or assessment feedback. This will help you refine your writing, research, presentation, and interpersonal skills. Feedback works both ways. Regularly update your research Supervisor on your research progress. Doing this will lead to a smoother academic journey. Tip: Where feedback on assessment is not clear to you, always ask for clarification via your Module Lead.

To prepare yourself for the future, embrace the many opportunities King's offers to continuously learn beyond your specific Neuroscience niche or research area. Develop additional skills including data analysis, coding, and peer teaching. This will enhance your profile and open up more opportunities for you in the future. Tip: Learn about the publication process in neuroscience. Learn about the relevant scientific journals and understand the review processes. Note the academic style of writing.

Look after yourself. Your physical and mental health is your wealth. If you are arriving from another country, you may need to adapt to 'strange' food, not to mind the Great British weather. Balance your considerable academic demands and your personal well-being. Develop ways to incorporate study, research, exercise, and nutrition into your daily routine interactively. This approach is one that can be sustained throughout the academic year. Exercise well, eat well, and sleep well - though please, not during class! Building a network is crucial for your social and career development. Actively engage in programme and networking events and workshops to connect with your part- and full-time peers and

who face similar challenges as you, as well as personal tutors, the programme team, module leaders, and potential collaborators. Finally, don't hesitate to ask for help when needed. This could be if experiencing challenges with your research Supervisor or seeking guidance with assessments. Be aware of University support services. If unsure, your Personal Tutor or Module Leader can point you in the right direction.

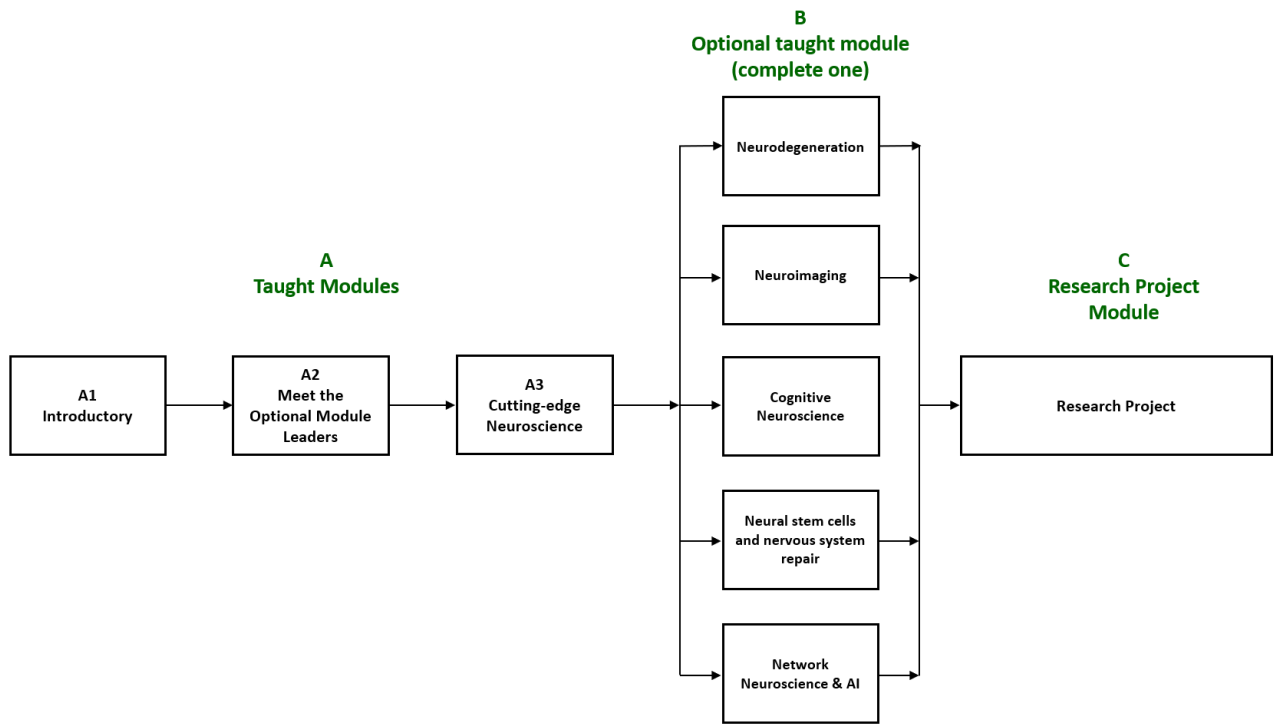
Student Code of Conduct

As a Student on the MSc Neuroscience, we expect you to conduct yourself in a manner that does not bring the programme or the IoPPN into disrepute. Remember that you are an ambassador for the programme and the IoPPN and strive to behave accordingly. Recognise and aim to embrace the diversity of the people you meet. Act responsibly, and be honest, considerate, respectful, and courteous towards others whenever possible. Be punctual for lectures and other appointments. If you are going to be late, or absent, try to inform pgneuroscience@kcl.ac.uk in advance. Show consideration for others regarding noise and switch off smartphones while in class. When engaging with KEATS, social networking sites or other web resources, refrain from causing offence. Be familiar with the [IoPPN Code of Conduct](#).

Personalise your education

It is important to remember that you do not have to master everything. Instead, discover your unique strengths and interests. Identify the assessments that intrigue you the most and align these with your future goals. Concentrate your efforts primarily on these areas. Your personalised approach will lead to success.

Structure of your MSc Neuroscience



You complete 5 modules; there are 4 taught modules A1, A2 and A3, followed by one Optional Module¹ (complete one), all 30 credits each, followed by 1 research project module (60 credits).

¹ While we strive to match you with your preferred module, please note that each module has limited seating due to classroom capacity. To ensure fairness and give everyone a chance to participate in a module of their interest, we will assign you to one of your two selected options. We appreciate your understanding and are confident that you will find value and enjoyment in the module you are placed in.

The A Modules

A1: An Introduction to Neuroscience

A2: Finding your Neuroscience Niche

A3: Cutting-edge Neuroscience

A1: An Introduction to Neuroscience

This introductory module is the first of the three compulsory modules that together aim to introduce Students from a broad range of different backgrounds to subject areas that are considered fundamental to an MSc in Neuroscience. This grounding will help you to decide which aspects of neuroscience you wish to specialise in and to inform your choice of specialised module and research project. The introduction covers a broad variety of disciplines encountered in neuroscience research. Lectures are delivered by experts in their field. This module introduces you to some fundamental aspects of brain neuroanatomy and neuropathology and to events occurring at the cellular and subcellular level. After successfully completing this module, Students will have a good understanding and knowledge of:

- Brain Basics; Neuroanatomy, Neuropathology & Neurotransmission
- Cell Basics; Cell Signalling & Cell Biology

A2: An Introduction to the Optional Modules

This module is the second of the three compulsory (A) modules that together aim to introduce you to subject areas that are considered fundamental to an MSc in Neuroscience. A2 Module will help you 'find your niche' and to discover which aspects of neuroscience interest you more and that you might wish to specialise in. A2 module consists of a selection of lectures from each of the 4 Optional (B) Module themes (B4 Neurodegeneration; B5 Neuroimaging; B7 Cognitive Neuroscience, B8 Neural Stem Cells and Nervous System Repair), and B9 Network Neuroscience & Artificial Intelligence, that build on knowledge gained in A1. You will get to meet the Optional Module Leaders who will tell you more about their modules and answer your questions. This will help inform your choice for your specialised (B) Optional Module and highlight themes of interest for your research project. A2 Module will also prepare you for the cutting-edge Neuroscience Streams you will learn all about later during A3 Module. After successfully completing this module, you will have received an introduction to, and a good understanding and specialist knowledge of 4 key areas in Neuroscience, which form the Optional Modules:

- B4 Neurodegeneration
- B5 Neuroimaging: Investigating brain function and dysfunction
- B7 Cognitive Neuroscience
- B8 Neural Stem Cells and Nervous System Repair
- B9 Network Neuroscience & Artificial Intelligence

A3: Cutting-edge Neuroscience

This module is the last of the three compulsory modules that together aim to introduce you to fundamental topics in Neuroscience while helping you identify the neuroscience topics that interest you most. Building on the knowledge gained from A1 and A2, the focus of A3 module is on cutting-edge Neuroscience streams; these are lectures delivered by world-leading neuroscientists working across a spectrum of Neuroscience topics who demonstrate how pioneering research techniques can help us understand and treat neurological disorders. A3 module consists of a selection of related lectures covering topics including DNA, neural stem cells, hippocampal function, motor control, psychoses, the hypothalamic pituitary axis (HPA), drug addiction, pre-clinical (i.e., animal) neuroimaging and viral neuroimmunology. This module is designed to provide high-quality neuroscience training to enable you to understand neurological and psychiatric disorders and to encourage you to consider developing possible treatments for them. The module provides an excellent foundation for Students who wish to pursue an academic or biomedical research career.

Finding your Niche

The B Optional Modules

B4: Neurodegeneration

B5: Neuroimaging; Investigating brain function and dysfunction

B7: Cognitive Neuroscience

B8: Stem Cells & Nervous System Repair

B9: Network Neuroscience & Artificial Intelligence

Which Optional Module will you choose...?*

*While we strive to match you with your preferred module, please note that each module has limited seating due to classroom capacity. To ensure fairness and give everyone a chance to participate in a module of their interest, we will assign you to one of your two selected options. We appreciate your understanding and are confident that you will find value and enjoyment in the module you are placed in.

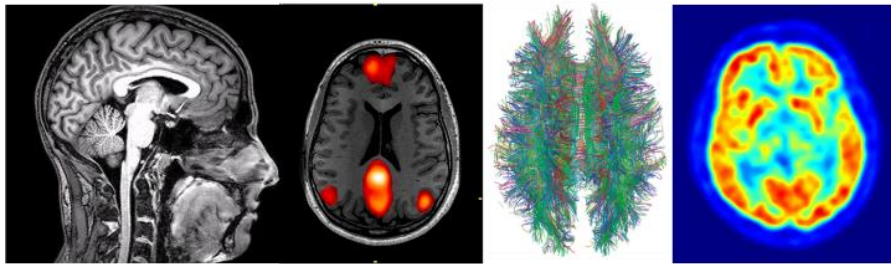
B4: Neurodegeneration



About the Module: The increasing lifespan of humans is resulting in a dramatic rise in the number of individuals affected by neurodegenerative diseases. Understanding the pathogenic processes involved in the development and progression of these diseases is crucial in order to develop effective therapies, which are currently lacking. This specialised module will provide students with an introduction to a number of neurodegenerative disorders that are growing in prevalence with our aging society. It will introduce them to core basic concepts of disease onset and progression, coupled with the latest advances of research in the field. This knowledge provides students with a strong platform to undertake cutting-edge wet-lab or clinical research projects working with world leaders in the field, based at Kings.

Students will gain a clinical and pathological overview of common disorders, such as dementia (including Alzheimer's disease), Parkinson's disease, and motor neuron disease, as well as less common disorders, such as prion diseases. The genetic influences and risk factors associated with the development of neurodegeneration will be reviewed. The focus of the module will include understanding the molecular mechanisms involved in the onset and progression of neurodegenerative disease. Students will be introduced to model systems for investigating relevant disease processes and in which to trial prospective new drugs. Teaching in this module is undertaken by lecturers actively involved in the research areas covered by this module and who are working primarily within the Department of Basic and Clinical Neuroscience at the Maurice Wohl Institute Clinical Neuroscience Institute at King's College London. Specialist lectures are given by lecturers from other institutions, ensuring that students are made aware of the most recent developments in the field. The B4 Neurodegeneration specialised optional module is suitable for all students registered for the MSc Neuroscience, regardless of their prior experience in this area.

B5: Neuroimaging: Investigating brain function and dysfunction



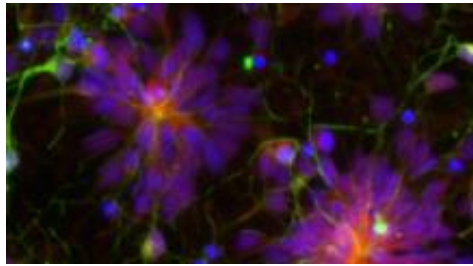
About the Module: In the last 40 years, the advent of neuroimaging has revolutionized clinical practice and had a huge impact on research in the fields of psychiatry, psychology, neurology, neuroscience and beyond. Clinical neuroimaging systems are mirrored by smaller scale preclinical systems allowing the same techniques to be applied in both fields. Students will start the module learning about the range of neuroimaging acquisition and analysis techniques available and the basic concepts of neuroimaging, building from the neuroimaging lectures in the core module, A3. Three main modalities of neuroimaging will be covered comprising Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET) and Electroencephalography (EEG). Image processing and analysis has been key to the establishment of neuroimaging techniques for research and clinical purposes and students will be taught about the classical and cutting-edge techniques that are used to explore and evaluate both structure and function of the brain. Importantly, students will receive specialised skills training that will include: - Practical labs on 'Statistical Parametric Mapping (SPM)' methods, the most widely used programme to analyse structural and functional MRI data - Designing tasks for functional imaging with MRI or EEG presents its own challenges and students on this course will be shown how this is achieved. - Statistics for Neuroimaging - The application of neuroimaging techniques to a range of areas in neurology, psychiatry and neuroscience will be used as exemplars in how neuroimaging has changed the landscape of research in these areas.

B7: Cognitive Neuroscience



About the Module: Cognitive Neuroscience is an interdisciplinary study of cognition and behaviour. It encompasses several branches of science including cognitive psychology, neuropsychology, neuroscience, psychophysics, neuroimaging, and genetics to provide brain-based accounts of cognitive functions such as perception, memory, language and social processes. For example, cognitive neuroscience helps us to understand why some people are easily distracted, have difficulty in learning and remembering new information, or become addicted to drugs. This module is designed to reflect the vibrancy in the field. Students will be introduced to relevant theoretical concepts and exciting new evidence on neuroscience of various cognitive domains, and cognitive development across the life span. To provide a fuller picture of the value of cognitive neuroscience, the module will also provide an overview of the methods used to delineate neuroanatomy of the brain and its numerous functions in health and disease. Skills development will include critical appraisal peer-reviewed literature and research methods, task design, task programming in PsychoPy (Python) and considerations of task development for neuroimaging methods. Teaching in this module is undertaken by lecturers actively involved in the research areas covered by this module and working primarily within the Institute of Psychiatry, Psychology & Neuroscience at King's College London. Specialist lectures are given by lecturers from other institutions, ensuring that students are made aware of the most recent developments in the field. The B7 Cognitive Neuroscience module is suitable for all students registered for the MSc Neuroscience regardless of their prior experience in this area.

B8: Stem Cells & Nervous System Repair



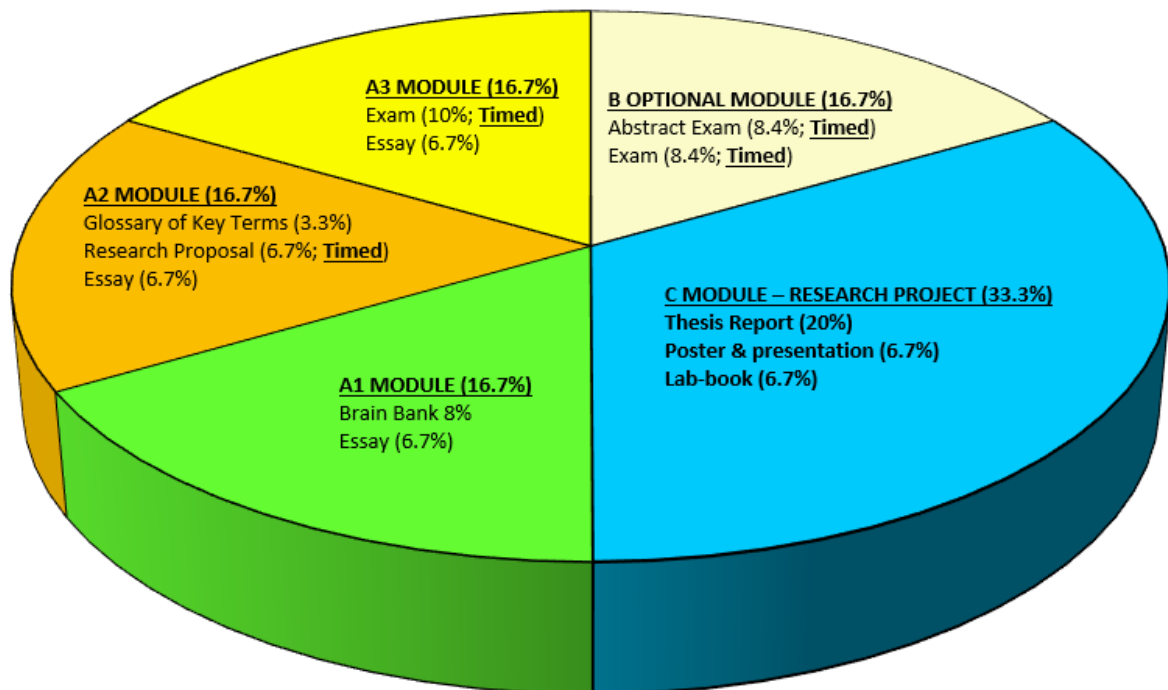
About the Module: Welcome to our innovative module, where the frontier of stem cell research converges with cutting-edge applications in neurological disorders. Prepare to be immersed in the latest advancements and knowledge in this fascinating and rapidly evolving field. This module offers a two-fold exploration, starting with fundamental neural stem cell biology and extending to translational research applied to a diverse range of neurological disorders. Delve deep into the realm of neural stem cells, discovering their immense potential as research tools—like the use of Induced Pluripotent Stem cells to model neurological disorders—and as powerful regenerative methods, such as stem cell transplantation. Within this comprehensive framework, we aim to broaden your horizons further and immerse you in a dynamic learning environment where you will not only grasp the intricacies of peripheral nervous system repair and central nervous system regeneration but also gain valuable insights into epigenetic and imaging approaches. Our specialized curriculum ensures you will be at the forefront of innovative research methodologies. Guided by our lecturers who are experts and active researchers in their field, you will engage in thought-provoking lectures, enhanced by practical tutorials. Sharpen your abilities in abstract writing and the interpretation of scientific papers, fostering transferable critical appraisal skills that will serve you well beyond this course and be of use within your future research endeavours. At the heart of our teaching lies an unwavering commitment to ethics and commercial applications. Engage in enlightening discussions on the ethical use of stem cells for research and regenerative medicine, reinforcing your dedication to responsible scientific practices, while you will also have the opportunity to hear and engage with industry. By the end of this module, you will have developed a profound knowledge and understanding of the multifaceted research methods related to neural stem cells and nervous system repair, empowering you to interpret scientific literature with confidence and start your research project. We have your ambitions covered: Whether you aspire to undertake a research project in this dynamic area and desire to specialize further with a Research Project also in Neural Stem Cells and Nervous System Repair, or whether your appetite is for diversity, exploring research projects in different subject areas, and gaining a broader understanding of neuroscience's multifaceted landscape. Choose our module and let the captivating world of neural stem cells and nervous system repair become your gateway to ground-breaking discoveries and a fulfilling future in neuroscience research!

B9: Network Neuroscience & Artificial Intelligence



About the Module: The Network Neuroscience and AI module offers an immersive exploration into the fascinating world where neuroscience knowledge meets the frontiers of artificial intelligence (AI). This module is designed to provide students with an in-depth understanding of neurobiology, neuroanatomy, and computational neuroscience, contrasted with the dynamic field of AI, especially the principles and applications of neural networks. Students will delve into the complexities of human and machine intelligence, exploring their similarities, differences, and how one can inform the understanding of the other. Throughout the module, there is a strong emphasis on not just theoretical knowledge but also on practical application. Students will engage in hands-on activities, applying AI methodologies in neuroimaging and neuroscience research, fostering a responsible and ethical approach to scientific inquiry. The course will prepare students to confidently navigate the challenges and opportunities at the intersection of these fields, equipping them with the necessary skills and knowledge to contribute to future advancements in both research and professional work environments. This module is ideal for those who aspire to be at the forefront of neuroscience and AI, providing a unique blend of rigorous academic learning and practical, research-oriented skills. It is an opportunity to be part of an exciting and evolving field, paving the way for future innovations, discoveries, and diverse career opportunities.

MSc Neuroscience Assessment



Preparation Module Reading List

Learn the basics, or brush up on your knowledge

Open-source Introduction to Biochemistry and Neuroscience for all Students

[1. Moof protein structure playlist \(particularly parts 1 to 4\)](#)

-Quite an in-depth discussion of the basics of protein structure, plus some videos on specific protein structure and functions. A good refresher if you haven't studied protein structure for a few years!

[2. Professor Dave explains biology playlists](#)

A very basic introduction to biology. This might be useful if you have not studied biology or biochemistry before – it gives you a good overview of some of the topic we will cover in detail on the course

[3. Biochemistry playlists](#)

A brief introduction to nutrition, metabolism, medicine and general health

[4. AK lectures, playlists](#)

Again, these start at quite a basic level, and would be good if you haven't studied biology/biochemistry before or haven't studied them for a long time. These are slightly more detailed than Professor Dave explains. Playlists of particular use are biochemistry (intro to proteins, intro to nucleic acids, enzymes, carbohydrates and lipids, membrane transport, signal transduction pathways) and biology (cell structure, genetics and nervous system)

[5. For people with a non-molecular biology background, or if you wish to revise molecular biology, you may consider completing this course as preparation:](#)

<https://www.futurelearn.com/courses/biochemistry/1>

Text Books (available at King's College London's libraries and online)

[6.](#) Molecular Biology of the Cell, 6th edition- Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter. New York: [Garland Science](#); 2014. ISBN-13: 978-0815345244; ISBN-10: 0815345240

[7.](#) Molecular Cell Biology, 7th edition -Harvey Lodish, Arnold Berk, S Lawrence Zipursky, Paul Matsudaira, David Baltimore, and James Darnell. New York: W. H. Freeman; 2014. ISBN10: 0815344643; ISBN-13: 978-0815344643

"Fundamentals of Neuroscience" series offered by Harvard University on edX. This comprehensive series covers the structure and function of the nervous system, from individual neurons to complex brain functions. A free version (without certificate) is available.

[Fundamentals of Neuroscience | Harvard University](#)

Course Breakdown

1. **Fundamentals of Neuroscience, Part 1: The Electrical Properties of the Neuron**
 - Learn how neurons use electricity to transmit information.
 - Topics include bioelectricity, resting potential, passive membrane properties, and action potentials.
 - Duration: 5 weeks.
2. **Fundamentals of Neuroscience, Part 2: Neurons and Networks**
 - Explore how neurons work together to create complex networks.
 - Topics include synaptic transmission and neural circuits.
 - Duration: 6 weeks.
3. **Fundamentals of Neuroscience, Part 3: The Brain**
 - Understand brain functions, sensory perception, and brain anatomy.
 - Topics include sensation, perception, and functional regions of the brain.
 - Duration: 8 weeks.

RStudio - Learn the coding basics

Open-source Intro for statistical computing



Early in your MSc, you will learn to code –a key skill sought by employers. RStudio is an Integrated Development Environment (IDE) for R, a programming language for statistical computing and graphics. Get ready for your MSc Neuroscience with this RStudio Tutorial for Beginners:

<https://www.youtube.com/watch?v=mcYcH-1giM>

To get a feel for how R looks, see here for a beginner-friendly approach:

<https://www.codecademy.com/learn/learn-r/modules/learn-r-introduction/cheatsheet>

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