



Decoding Genetics: The building blocks of life

Module Coordinator	Jane Farrar, School of Genetics and Microbiology Aiden Corvin, School of Medicine
What will you learn from this Elective?	<p>Each human comprises 40 trillion cells with 3 billion letters of coded information (DNA) in every cell providing vital instructions - a code that is essential for health and which when defective causes many disorders. The first human genome sequence (published in 2003), involved decades of work and cost \$2-3 billion. Today, over a million human genomes have been sequenced, now at a cost of \$500 each, a 6 million-fold price drop! Given that each person's human genome is directly relevant to their health and well-being, this module is relevant to everyone. Genetic information has ramifications not only for medicine, but for many other areas of our lives. Via this module students will gain a real knowledge of key concepts in genetics and will understand the rapidly expanding role for genetic information in our societies from novel treatments for diverse diseases, genetic causes of aging, gene editing technologies and designer babies, bioethics, the origin of human populations, personal ancestries and forensic science. Students will be challenged to think about the optimal use of genomic information in society and the importance of input from scientific, clinical, legal, commercial and ethical disciplines.</p>
Student Workload	<ul style="list-style-type: none">• Face-to-face lectures on genetics from internationally leading scientists (10 hours of lectures + 30 hours of preparation/reading)• Genetics online lectures/activities providing fundamental concepts in genetics and outlining globally renowned seminal discoveries (5 hours of online activities + 15 hours student study)• 5 tutorial / discussion forums focused on bioethical debates - supported by online activities including class referenda (5 x 1hour tutorial sessions and 25 hours of preparatory work and topic research)• Participation in online discussion platform / blog for debates and referenda (10 hours)
Assessment Components	<p>Assessment (MCQ) after the initial 5 online sessions to evaluate basic concepts in genetics (20%).</p> <p>Assessment at the end of the elective (40%) predominantly involving MCQ to assess knowledge of the range of genetics topics covered during the TE.</p> <p>Students will work in groups to produce a multimedia presentation / snapshot of a topic particularly pertinent to genetics and society in 2020 (40%).</p>

Indicative Reading List	A full reading list and list of learning resources will be provided to enrolled students prior to the start of the module.
Learning Outcomes	<p>On successful completion of the module, students should be able to:</p> <ul style="list-style-type: none">• Understand and explain many basic principles in genetics• Appreciate the power of genetic technologies in novel drug development for diverse diseases• Consider and analyse the far-reaching societal impacts of genetic information and its significant role in driving change• Understand, critically evaluate and contribute to discussion and debate regarding the role of genetics in healthcare, agriculture, business, law and bioethics