

NHS GENETICS EDUCATION CENTRE

UPDATE

Spring 2010



Welcome

Welcome to the Spring 2010 edition of the *NHS Genetics Education Centre Update*. We do hope that you enjoy reading the latest news from the Centre and that you will continue to contact us with your ideas about how we can support genetics education and activities in practice.

Professor Peter Farndon, Director

Forthcoming Centre conference postponed

It has been decided to postpone the forthcoming Centre conference '*Bridging the Gaps: Making genetics teaching clinically relevant*', which was due to take place on 21st September 2010. The postponement will enable the Centre to launch several new initiatives simultaneously once completed. Watch this space for further details.

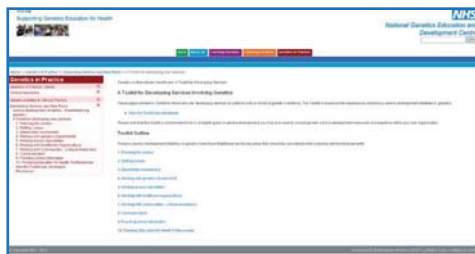
New opportunity coming soon - e-Learning Project Officer

To support our e-learning and blended learning programme the Centre is looking for an e-Learning Project Officer. This vacancy will be advertised in early May via the NHS jobs (www.jobs.nhs.uk) and www.jobs.ac.uk websites. Full details will be available online and also via the Centre's website: www.geneticseducation.nhs.uk

The post will be an 18 month fixed term contract and has been awarded AFC Band 6.

A Toolkit for Developing Services Involving Genetics

The Department of Health funded a number of projects to develop innovative models for integrating genetics into 'mainstream medicine'. The Centre has worked with these pilots to explore their experience of developing new roles and services and an online Toolkit has been developed for the NHS <http://www.geneticseducation.nhs.uk/genetics-in-practice/developing-services-and-new-roles/a-toolkit-for-developing-new-services.aspx>.



An article describing the development of the Toolkit, and the implications for those developing health services for people with or at risk of genetic conditions, has been accepted for publication by *BMC Health Services Research* and will be freely available online later this spring at <http://www.biomedcentral.com/bmchealthservices/>

COMING SOON: An Online Family History Drawing Tool

Following consultation with a number of user groups, the Centre has begun development of an online family history drawing tool. Designed for use by non-genetics specialist healthcare professionals and patients, the tool will guide them through the collection of family history information, resulting in a pedigree which can be saved for the patient records or printed out. Pedigrees can be used to support discussion and decision making between patients and their healthcare providers as well as highlighting important information to genetics specialists should a referral be appropriate. The tool will form part of a package of other educational resources to support the development of skills in collecting family history information. If you're interested in hearing more about this initiative and would like to be involved in the initial pilots, please contact Karen Sage on 0121 263 6647 or email karen.sage@geneticseducation.nhs.uk

The Centre moves into the world of e-learning and blended learning

A busy, demanding work life for most healthcare professionals makes it increasingly difficult for them to find time for traditional face to face teaching or continual professional development. And with more and more of our daily lives moving online, we find ourselves already using computers almost every day.

With this in mind the Centre is moving forward into a new and exciting opportunity to develop a new e-learning and blended learning programme. To achieve this, the Centre has recruited Peter Rainger, who was previously at the University of Birmingham as a Senior e-Learning Consultant in their Learning Development Unit. Peter brings with him many years of experience in designing and developing re-usable learning objects and e-learning resources.

The new e-learning and blended learning programme will design and develop:

- re-usable learning objects
- e-learning resources
- online and distance courses
- blended learning courses (mixing face-to-face and online activities)

All of which will be available via the Centre's website.

Courses and teaching resources will also be developed to meet the needs of specific healthcare groups and specialities, as well as providing accessible resources on genetics for independent learners.

News of all future developments will be found on the Centre's website at www.geneticseducation.nhs.uk

Interested in genetics? Visit our new Blog and post your comments

The National Genetics Education and Development Centre has recently launched its new blog. Its aim is to highlight current topical stories about genetics and encourage users to reflect, share opinions and discuss these topics online. Features of the blog include the 'In the News' section, discussing genetics stories which are currently being talked about in the media, updates about genetics education and new developments from the Telling Stories, Understanding Real Life Genetics website.



The Centre has always encouraged personal feedback from our healthcare colleagues. With blogging becoming more and more popular, and even available through your mobile phone, the opportunities are endless for you to post your comments. That journey to and from work on the bus or train will never be the same again!

So the next time you get a spare five minutes (!), grab a cup of tea and visit www.geneticseducation.nhs.uk/blog and leave us your views on what's currently happening in the world of genetics.

Education Review for Nursing & Midwifery

As part of the Centre's work to ensure that the genetics knowledge and skills required by health professionals remains relevant in the changing face of care provision, the Nursing Professions Programme is currently undertaking a review of its education framework[1].

The review will generate individual frameworks for nursing and midwifery that set out the minimum level of competence required at registration. Detailed learning outcomes along with guidance on how the content could be delivered within curricula and supporting resources for teaching and learning will also be produced.

A number of meetings, workshops and consultations are taking place during 2010 and early 2011, with the nursing framework and accompanying material in place to support the new NMC standards for pre-registration nurse education which will be launched in the autumn of 2010. The first meeting of the midwifery stakeholder group will take place on 23rd June at Birmingham.

For more information please contact Emma Tonkin at etonkin@glam.ac.uk

[1] Kirk, McDonald, Anstey & Longley (2003) Fit for Practice in the Genetics Era, a competence based education framework for nurses, midwives and health visitors. Pontypridd ISBN 1-84054-104-0

New factsheets available to support the learning of core genetics concepts

In order to carry out genetics activities in the clinical setting, many health professionals need to have an understanding of the genetic principles that underpin these activities. To support the learning of core genetics principles, the NHS National Genetics Education and Development Centre has liaised with Andrew Read, co-author of the internationally acclaimed '*Human Molecular Genetics*', to produce a number of factsheets introducing core genetics concepts. Eight factsheets have been produced initially to cover topics such as *cell structure and function*, *the cell cycle* and *the nature of genetic material*, which can be downloaded from the Centre's website. By the autumn, a further sixteen will have been completed including subjects such as *tumourigenesis*, *gene expression*, *the chromosome theory of inheritance* and *the Human Genome Project*. The factsheet describing the properties of DNA is included with this newsletter.

Core Concepts Series
National Genetics Education and Development Centre

DNA

DNA is the hereditary material that carries the instructions for building and maintaining an organism. It is a long, thin molecule that is made up of two strands of DNA. The strands are joined together by hydrogen bonds between the nitrogenous bases. The sequence of bases determines the genetic code.

Core Concepts Series
National Genetics Education and Development Centre

Cells

Cells are the building blocks of every living organism. Some simple organisms, like yeast or bacteria, consist of just a single cell. Other organisms, like humans, are made up of many different types of cells. Each cell has its own nucleus, which contains the genetic material. Cells are able to take in nutrients and get rid of waste products.

Ordering a genetic test: What do health professionals need to know?

The Centre is working on a collaborative project with the UK Genetic Testing Network with the aim to provide resources for healthcare professionals ordering genetic tests. We are currently working on the first phase of this project, an audit carried out at the West Midlands Regional Genetic Laboratory, to identify how many different genetic tests are being ordered and by whom. The audit is providing us with information about the wide variety of healthcare professionals who are ordering genetic tests, which will inform the next phase of the project to assess current work practices.

For more information please contact Caroline Bradley at caroline.bradley@geneticseducation.nhs.uk

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DNA

DNA (deoxyribonucleic acid) is one of the many chemicals found in our bodies. Like other chemicals (fats, proteins, sugars...) the DNA molecules in our cells are far too small to be seen under the microscope, but can be studied using the methods of chemistry. DNA is interesting because of what it does, but to understand what it does we need to know a little about its chemical structure. Chemical studies during the 1930s to 1950s showed that a DNA molecule consists of an immensely long chain of subunits called **nucleotides**. There are just four different sorts of nucleotide, called for short A, G, C and T. Two chains of nucleotides are wound round one another to make the famous DNA double helix, described by Francis Crick and James Watson in 1953 (Fig. 1 DNA base pairs).

DNA has two key properties:

1. It is the repository of genetic information. A cabbage seed “knows” how to grow into a cabbage, rather than a carrot or a frog, because of the information contained in its DNA. The information in a DNA molecule is encoded in the sequence of the A, G, C and T nucleotides along the chain, just as the information in this factsheet is encoded in the sequence of the 26 letters (plus spaces and some punctuation marks) that make it up. A cell needs all sorts of complicated machinery to read and act on the information, but the information itself is contained in the DNA sequence.
2. A DNA molecule can be exactly copied. The two strands of the double helix fit together like the two halves of a zip. If one strand has a certain sequence of A's, G's, C's and T's, the other strand has to have an exactly complementary sequence where A pairs with T and C pairs with G. Then, if the two strands are separated, a cell can use each as a template to assemble a complementary strand by lining up separate A, G, C and T units and zipping them together. By this means the DNA that was present in the original cabbage seed is copied into every cell of the cabbage. Equally, every cell of a person (with a few minor exceptions) contains an exact copy of all the DNA that was present in the original fertilised egg. That is why one can test somebody's DNA using a blood sample, a mouthwash, a skin biopsy, or any other source of cells. They all contain the same sequence of A, G, C and T units.

Compared to the sequence of letters in this factsheet, DNA sequences are exceedingly long. A human cell contains 46 double helical DNA molecules (found in the 46 chromosomes) that, between them, contain 6,000,000,000 A's, G's, C's and T's.

The DNA sequence of every normal cell of a person is the same (with a few minor exceptions), but the DNA sequences of two individuals are not identical. Some of those differences are what cause each of us to be recognisably individual, while others are important determinants of health and disease.

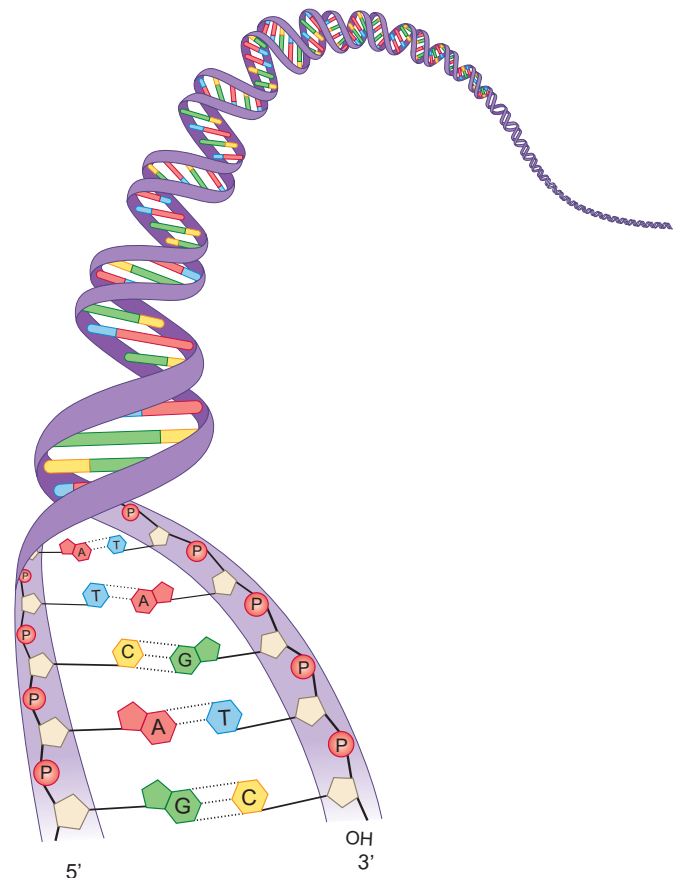


Fig. 1 DNA base pairs

Related factsheets in the series

- The structure of DNA and RNA
- DNA replication
- Variations in DNA and their effects