Stratified medicine programme is changing the face of cancer research

The stratified medicine programme has been running at CUH since September 2011 and has the potential to change our whole approach to cancer treatment. Donna Goymer, the programme coordinator based in the Cambridge breast cancer research unit, explains...

What is the programme, why has it been established, and who is involved?

This national study aims to identify genetic changes in six cancer types: breast, lung, ovarian, colorectal, malignant melanoma and prostate in a time frame that would make the information useable clinically. The principle is if we can understand which mutations, or “spelling mistakes”, are present in the patients' tumour cells' DNA, and get the results back in a timely manner, this will, in the future, help guide treatment decisions and enable clinicians to tailor drug regimes to an individual's specific tumour cells.

Sponsored by Cancer Research UK, the study’s principal investigator is consultant histopathologist Prof Peter Collins. Nationally, the remit is to recruit 9,000 patients over two years in phase one of the programme. Working with partners such as Papworth, the Experimental Cancer Medicine Centre at Addenbrooke’s aims to recruit 1,100 patients from the six tumour sites. Patients undergoing cancer care will be asked for permission to use surplus tissue taken during routine surgery. Tissue bank staff will then send samples to the technology hub in Birmingham, where DNA will be extracted and tested for a set of specific genetic faults and variations. Any excess DNA will be stored for future ethically approved research projects. Patients may also give consent to have this data used to help build knowledge about the interaction between genes and treatments.

How will it benefit patients?

The programme is initially concerned with introducing molecular medicine into cancer patient care, as well as facilitating translational research, so scientists and clinicians are trying to improve the technology, the diagnostic techniques and the IT to make this routine in the NHS of the future rather than devising new anti-cancer treatments (drugs) per se.

As phase one is a pilot study, it will not affect the way patients are treated but they may help
contribute towards research into future treatments. The ultimate outcome, however, is to identify patients who need intensive therapy or will benefit from one of the new targeted therapies and to save patients who have less aggressive tumours from the toxicities of treatments they don’t need, avoid hospital visits and avoid admissions. The selection of the most appropriate treatment for a patient will mean better outcomes, improvement in the quality of life and may also free up clinicians to treat other patients.

“It could massively change how we treat cancer patients,” says Donna. “Because we’re aiming to get all this information in real time it will improve patient care. The approach to cancer research is not new. We’re already doing it - but on a much smaller scale and generally only in specific research studies. This bigger unselected cohort, backed by CRUK, will provide more meaningful data.”

**The hunt for mutations**

By way of an example, certain types of melanoma can be quite aggressive and there are few treatments. New drugs have been produced that are very effective, but only if the melanoma tumour cells have a particular change in a gene called BRAF. Testing for this BRAF mutation would indicate if the patient will benefit from a new – and particularly expensive - drug.

The whole point of the study is to find efficient ways of introducing genetic testing of tumours routinely into the NHS, and to do this in a high quality but affordable way so that the NHS can take it on in the future. When new targeted drugs become available in the future we will have helped to develop a system that is delivering the new tests required. Patients will therefore get access to both tests and drugs when they become available.

**Mapping the data with JCIS**

The first phase of the stratified medicine programme will run for two years and started with seven UK clinical centres. The JCIS team at CUH have been working hard to enable teams to pull relevant data for the study from unrelated hospital systems; this information is then sent to the Eastern Cancer Registration and Information Centre where the data on the gene changes is also stored.

“Without doing this we’re not moving forward and for Addenbrooke’s to be part of a national research study of this status is something in itself. Our clinicians are learning what genetic profiling means for patients and how this might be used clinically in the near future. Everyone has had to understand these developments very quickly.

“The Addenbrooke’s site hosts many groups at the forefront of cancer research, but this has...
to be translated into practical use in the clinic.”