

Chicks to give scientists clearer picture of fetal development

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Scientists hope to gain a greater understanding of disease and birth defects with a new imaging database that will map the expression of genes that control development.

The research coordinated by The Roslin Institute at the University of Edinburgh, in collaboration with the MRC Human Genetics Unit (Edinburgh), University College London, University of Bath and Trinity College Dublin, will log thousands of three dimensional images of chicks taken during the first 10 days of their development.

The so-called chick atlas will exploit the information and resources recently made available from the sequencing of the mouse and chicken genomes. In particular, it will build on the pioneering Edinburgh Mouse Atlas at the MRC Human Genetics Unit in Edinburgh (e-MouseAtlas.org).

Images from the chick atlas will show not only where genes key to our biological make-up are switched on but also when they are turned on and off to ensure healthy development.

The £2.6 million initiative, which is funded by the Biotechnology and Biological Science Research Council (BBSRC) through its new LOLA ("longer and larger") scheme will help researchers understand why problems occur in the development of limbs and of the nervous system, which can cause conditions such as spina bifida.

In the long term it could also have implications for the treatment of diseases such as cancer as it will provide insight into the role genes play when cells divide and proliferate.

The images will be stored in an online database, which can be accessed and added to by scientists from across the world. As an online database or encyclopaedia it is also available to the public and educators, to be used as a tool to teach development.

Professor Dave Burt, of the Roslin Institute, University of Edinburgh, said: "The chick atlas has the benefit of looking at how genes relate to development in both time and space; letting us know when and where genes make an impact."

"These early stages of a chick embryo are essential in the development of the nervous system, heart and limbs and by understanding what happens we can also understand why things may go wrong."

In the initial stages the chick atlas will look at mapping 1,000 of around 18,000 chick genes predicted from the chicken genome sequence. By cross referencing similarities with the mouse atlas, scientists can identify the most relevant genes in human development.

Professor Richard Baldock, of the MRC's Human Genetics Unit in Edinburgh said: "The mouse atlas team will contribute their expertise in atlas databases to deliver this important resource. The ability to capture and compare data between species will provide critical clues to how embryogenesis is controlled by gene activity. As a physicist and computer scientist this is an exciting time to be in biomedical research".

Source: University of Edinburgh

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