

Congenital heart defects could have their origin during very early pregnancy

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The origins of congenital heart defects could be traced right back to the first stages of embryonic development, according to University of East Anglia (UEA) research.

Findings published today in the journal [PLOS ONE](#) show that the beginnings of important parts of the heart can be traced to very early stages of embryo development. The research has been funded by the British Heart Foundation.

Biologists investigated [chicken eggs](#) at the gastrulation stage - between 12 and 14 hours after fertilisation.

They found that some cells would go on to create the anterior and secondary heart fields - after the initial formation of a primitive linear heart tube.

This method of understanding the correlation between the embryonic origin of cells and later stages of development is called 'fate mapping'.

The addition of these early cells to the growing heart is crucial as it allows the heart to develop and form other important structures including the [outflow tract](#).

The research is the first to 'fate map' the origin of the cells which contribute to the outflow tract in early stage embryos.

Many cardiac malformations present in newborns are associated with the outflow tract and it is hoped that understanding some of the underlying causes may be helpful to affected families.

Prof Andrea Münsterberg, from the school of Biological Sciences at UEA, said: "We were researching chick embryos, but the process of development in humans is very similar. However while the gastrulation stage takes place within just a few hours in chicks, it takes a little longer in humans and happens in the third week of

pregnancy.

"It is likely that what we learn in chick embryos can be applied to human development. The next step in our research will be to identify the factors, which guide these early cardiac [progenitor cells](#) to the right place at the correct time."

More information: 'Fate mapping identifies the origin of SHF/AHF progenitors in the chick primitive streak' by Esther Camp (UEA), Susanne Dietrich (University of Portsmouth) and Andrea Münsterberg (UEA) is published by PLOS ONE on December 13, 2012.

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Provided by University of East Anglia

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