Patient Information
DONATING FROZEN EMBRYOS TO RESEARCH PROJECT R0189- Studies on the establishment and properties of sperm and egg precursor cells (PGC)

Background

Primordial germ cells (PGC) are the precursors of both sperm and eggs. The founder population of PGCs develop very soon after embryos implant in the womb, and therefore they are amongst the earliest specialised cells to be formed during embryonic development. These cells are unique and immortal since they have the potential to generate a whole new organism, and therefore all subsequent generations. As such, they play the crucial role in transmitting genetic (and epigenetic) information to a new generation.

Currently, we have little or no knowledge of how human PGCs become established, since they form in very early embryos and have never been investigated. It is important to know precisely how the founder population of sperm and eggs are formed since errors in their specification could contribute to human infertility. Development of these cells can also go awry occasionally, and result in the formation of testicular germ cell cancers. Above all, defects in the formation of germ cells may also lead to infertility, or abnormality of embryos that develop from them after fertilisation. As transmitters of genetic information to subsequent generations, we also need to improve our knowledge of their precise properties to determine if certain environmental factors and diet alter their properties resulting in fetal and placental malformations.

Using our increasing knowledge of how PGCs develop in laboratory animals, we now have the means to establish an informed programme of research to identify and study the emerging founder population of PGCs in early human embryos. Following culture of early blastocysts, it will be possible to dissect out specific fragments of tissues where we expect to find the emergence of the first cells to undergo changes for PGC specification.
Once early PGCs are examined and well characterised, we have a possibility to culture them further. In the future, it may even be possible to culture them until they develop to form mature gametes.

How will this help me?

The research we do will not help you specifically, and we are unable to provide any information on any particular embryo. The collective information will be studied scientifically and the information gained published in the appropriate medical and scientific journals.

This knowledge of how PGC develop, may pave the way to designing procedures for generating PGCs and possibly even gametes from pluripotent stem cells, which are derived from blastocysts. This would obviate the need to use more embryos for research. Now, with the ability to convert adult cells, such as skin cells, directly into pluripotent stem cells (so called induced pluripotent stem cells, or iPS), we also have the prospects of using iPS for studies on human germ cells. For example, we can make iPS cells from patients that may have mutations that affect germ cell development resulting in infertility or abnormal development. In this way, we can directly examine how specific mutations affect germ cells, and based on this knowledge, we can potentially develop therapeutic agents to overcome the effects of such mutations. At the same time, we can also directly examine how environmental factors affect germ cell development. More importantly, this work may also pave the way to understand how environmental factors might affect development and properties of germ cells, which could in turn result in defective genes and their transmission, resulting in diseases in, potentially in the long term in subsequent generations.

Where will this work be performed?

These studies will be done in collaboration with researchers at the University of Cambridge, under a research licence issued by the Human Fertilisation and Embryology Authority (HFEA).
The scientists involved in the research may have access to identifiable information which cannot be erased before providing the researchers with the 'straws' containing the frozen embryos. The identifying information will however be discarded with the 'straws' after the embryos are thawed and will not be used by the researchers.

Important Regulatory Aspects

If you have consented to the use of your embryos in the research project you can still withdraw your consent to research at any time up to when the embryos are used in the research project. If you choose to do this, it will have no effect on you or your treatment if that is still on-going. If you wish to withdraw your consent please email alison.campbell@carefertility.com, or contact the unit at which you were treated and ask to communicate with the Laboratory Manager.

Your decision on whether or not to donate to the research project will have no influence on your on-going fertility treatment, as only embryos considered unsuitable for use in treatment, or excess to treatment requirements, will be used in the research project. As explained in the Consent Form, this does mean you will not be able to gain any information relating to your particular embryo.

At the end of the research all embryos will be allowed to perish.

Please note that we encourage you to ask any questions that are on your mind at the time of signing the Consent Form or anytime thereafter. If you have any later questions you should contact the Laboratory Manager at the CARE clinic at which you had your treatment.

Glossary

Blastocyst	The stage 5 – 6 days after fertilisation when the zygote has reached about 30 or more cells
Embryo	The name given to the zygote once it divides into two cells, and continues cell division
Euploid	A normal chromosome profile
Fertilisation	When the sperm and the egg fuses together
Fetal (foetus)	The early stages of life prior to birth
Gametes	Egg or sperm
Placental (placenta)	The tissue that connects the developing embryo to the lining of the uterus.
Pluripotent stem cells	Cells that have the ability for form any adult cell type.