

Biojewellery

Designing Rings with Bioengineered Bone Tissue

Project information sheet

Background

EPSRC funded research at Kings College London has expanded on research territories initiated by Prof. Larry Hench and Prof. Dame Julia Polak in 1999 which focus on the production of cells and tissue for implantation. The field of tissue engineering includes the design and synthesis of new materials which act as scaffolds for the growth of cells. These materials are described as bioactive; that is when used as an implant they create a profound bond with surrounding tissue, which effectively grows into the scaffold. Additionally the materials can be used outside of a body to create a culture of living tissue from a small sample of cells. The production of bone tissue in a laboratory environment is the scientific process which is at the heart of this public awareness project.

How can we best communicate and share this process with the general public? Advancements in science are often encountered as newspaper articles which can simplify, trivialise or obscure the underlying research. Design can play a crucial role in situating the science within the everyday experiences of an audience.

How could we treat lab grown bone not as a material for repair, or as a symbol of deterioration, but in a manner which exploits its relationship with the living donor? Bringing together Dr Ian Thompson from Kings College London and designers based at the Royal College of art, a pair of rings will be made. These rings will use silver and gold, but also include laboratory-grown bone from two donors; a couple selected from the public. The rings will then be exchanged by the couple as a symbol of their commitment, each wearing the body of their lover on their finger. What are their reasons for becoming involved in the project? How does this change the value of the ring that they wear? Has their participation in the project changed their relationship in some way?

A model of the ring using a combination of cow marrow-bone and etched silver. The final rings will be designed in consultation with the couple

By situating the process of bone tissue engineering within the framework of a relationship between 2 people, the Biojewellery project aims to make this science process engaging. Does the project make this process clear for the audience? Does it make the process lively, engaging and thought provoking? Does the project relate the process to social contexts which encourage an ethical debate, and raise critical, constructive questions over how advancements in science relate to our identities and desires?

Description of project activities.

The project has three broad phases; a period for the design and development of the rings and supporting material, a live event at the Dana Centre and a public exhibition at Guys Hospital. These stages are broken down on the following page.

There is an emphasis on continual documentation in the form of a website, following a close working relationship with the couple. This will act as a project diary. It will encourage evaluation of the process and create a dialogue with an audience.

Project activity is described on the next page.



Begin discussion and debate

- research tissue engineering process
- designs of rings, castings etc.
- adverts placed for couple
- project management, press releases and promotion

Object designs, notes and references for writing.

Search for the couple

- interviewing and selecting
- photography, filming, editing, documentation
- project management, press releases and promotion

Couple selected, initial documentation on website, images and video.

Donating cells through surgery

- wisdom tooth removal with dentist at Guys hospital
- bone chip transported to lab for freezing
- photography, filming, editing, documentation
- start promotional activity for exhibition

Photo and video documentation, 2 sets of lab grown bone, documentation to website.

Design the jewellery with the couple

- further design and production of rings
- photography documentation
- further promotion for exhibition

4 finished rings, models and samples, photo video documentation and website.

Growing the bone tissue

- cell freezing, digestion to produce osteoblasts
- propagation of cultures, induction onto sol-gel foam
- delivery to couple, presentation, interviews
- photography, documentation
- booklet and materials for exhibition prepared

Rings given to couple, photo video documentation and website.

Public discussion and exhibition

- preparation for public dialogue
- Live event with debate and web-broadcast
- Questionnaires for audience
- Archiving, transfer material to website

The project is launched with the public debate at the Dana Centre, film of event is added to website.

- project management, press releases
- exhibition at Guys Hospital
- photography/documentation
- follow up with couple

Public exhibition, documentation and website

Evaluate and document the project

- process questionnaires from live event and exhibition
- quantitative interviews with project team, an audience sample and the couple
- final project report with evaluation

A full project report for print and web.

The porous, bioactive ceramic scaffold on which tissue growth takes place, a model of the ring using a combination of cow marrow-bone and etched silver, and a sample of cow marrow to illustrate the final bone sample.

