

## **BIOHOME: THE CHROMOSOME KNITTING PROJECT**

**Texts for a performance/installation**

**BY CATHERINE FARGHER**



© 2006

**Catherine Fargher**

**Email: [iristorm@ozemail.com.au](mailto:iristorm@ozemail.com.au)**

## SETTING

The Performance takes place in an installation within a 'biotech display home', *BioHome*<sup>TM</sup>. Initially the audience enters the gallery to view 4 specific spaces: the 'entry', the 'chill-out space', the 'kitchen' and a 'display room' area with bedroom/nursery/knitting room settings. The overall imagery is domestic: a kitchen table top, a bassinet containing a microscope, a chair with knitting, a bed with a screen, and a small doll's house containing biotech products and pharmaceuticals. It is only when the audience enters and inspects more closely that this domesticity is disrupted by the intriguing and uncomfortable presence of live cells, DNA fibres, plant DNA, Petri-dishes and needles. Scientific samples will be fully labeled in laboratory or museum style. Data projection screens are placed behind the 'kitchen' and 'display room' areas, and a plasma screen is situated in the entry area.

1. **BioHome/Lab entry.** This will display the markings for PC2 laboratories, the lab classification for working with bio-hazardous materials. Biohazard signs will be displayed. Small groups of audience members will be assisted by the performer/s to put on PC2 standard lab clothing, i.e. lab-coats, rubber gloves, hair ties etc. A full safety protocol will be explained over the sound system. When the performance is not taking place, audience members can listen through infra-red headphones to the safety instructions and other edited interviews. Maintenance/disposal of the cells and plants will continue in the installation space outside performance times, i.e. changing cell mediums, refrigeration and incubation etc. A 'welcoming promotional video' featuring sponsors names and multilingual translations will be played on the lab entry plasma screen at the start of the live performance. This video will also be on a loop for the duration of the installation.
2. **The Biotech kitchen/DNA extraction.** At a small kitchen bench, the apparatus will be set up to do rudimentary DNA extractions: a centrifuge, mortar and pestles, micro-tubes, scales and live seedlings, interspersed with blenders, jugs and common kitchen apparatus. A number of audience members will be asked to

participate with the extraction process, which will involve the grinding, centrifuging and spooling of DNA threads. This will be a light and informal entry into the work, not unlike a cooking show, a chance to start asking questions.

**Projection:** On a data screen behind the kitchen bench, there will be a slide display of safety equipment and lab equipment from SymbioticA 'Wet Biology' workshop<sup>1</sup>. Outside 'show' times, the audience will also view the process of culturing live cells and plant biology processes<sup>2</sup> on a projected screen, allowing them to be immersed in the living experiments. **Sound:** A full safety protocol will be explained over the sound system<sup>3</sup>.

3. **Bio-Bassinette/Live caterpillar pupae cell interactive.** A nursery like setting, featuring a bio-bassinette, which expresses the notion of 'maternity', 'nurture' and 'kinship'. In the bassinette, under a microscope, a small vial of cultured sf9<sup>4</sup> (caterpillar pupae) cells suggests a tiny being. Nicknamed 'Thumbelina', this is a wished for child - not quite what was asked for, but this will do nonetheless. **Sound:** This setting will be accompanied by sound on infra-red headphones which incorporates edited text from verbatim bioethics discussions recorded by the artist at the SymbioticA workshop. A live sound mix by Terumi Narushima accompanies the live performance.<sup>5</sup> **Projection:** This setting features video footage of sf9 cells, and footage of artist culturing sf9 cells in the laboratory<sup>6</sup>. A

---

<sup>1</sup> SymbioticA 'Wet Biology' workshop, held at University of Western Australia, School of Anatomy and Human Biology in Perth, Sept 4<sup>th</sup>- 7<sup>th</sup> for the Biennale of Electronic Arts, 2004.

<sup>2</sup> Footage taken by Virginia Hilyard (Plant DNA extraction) and Cominos Zervos (Fish nerve cell explant extractions from SymbioticA 'Wet Biology' workshop, Wollongong University, Faculty of Creative Arts and School of Biological Science, 20-24<sup>th</sup> June 2005)

<sup>3</sup> Safety Protocol is taken from the SymbioticA 'Wet Biology' workshop handouts, prepared by Gary Cass, workshop facilitator.

<sup>4</sup> Sf9 cells from BioHome™ (sponsored by Invitrogen™) are derived from *Spodoptera frugiperda* (fall army worm), pupal ovary tissue. They are usually used for baculovirus propagation and recombinant protein expression.

<sup>5</sup> This sound results from a collaboration with Terumi Narushima, Doctoral student, University of Wollongong, Faculty of Creative Arts, who also attended the SymbioticA Wet Biology workshop in Wollongong, 2005. Music utilizes recorded sounds from the SymbioticA wet Biology workshop, placed in a 'pd' programme software to create computerized patterns based on a range of knitting stitches, i.e. honeycomb, fern stitch, moss stitch, herringbone etc. This can change the sound for the gallery setting, as well as being used in live performance.

<sup>6</sup> Sf9 cells were shot through an inverted microscope x 100 times. All footage was taken at the University of Wollongong School of Biological Sciences, Cell Culturing Department, with assistance from Associate Professor Mark Wilson.

mirror placed on the ceiling deflects this image onto the muslin material covering the bassinette.

**Also featured: the Dolls house/Miniature biotech display home.** Here many samples of biotech products are housed: boxes of pharmaceuticals - including vials of pharmed hormones<sup>7</sup> - small toy animals, miniature *ChromoKnit Dollies*<sup>TM</sup>, micro-tubes, needles and sterile swabs for injections.

4. **The temperature controlled bio-knitting basket/Chromosome knitting.**

This space features a knitting basket, which contains a mini fridge in which refrigerated salmon DNA fibres<sup>8</sup> are stored. Also featured in the knitting basket are knitting needles, wool and two *ChromoKnit Dollies*<sup>TM</sup><sup>9</sup>. This image suggests waiting and again, mothering, nurturing. The audience will be able view DNA fibres or wool. *ChromoKnit*<sup>TM</sup> Doll will be available for purchase after the presentation, and may feature an accompanying DNA readout based on a child's amniocentesis results<sup>10</sup>. Accompanied by interactive knitting pattern music.

**Projection:** Live camera feed in performance of knitting fibrous DNA and wool, projected on data screen behind. **Sound:** Terumi's live music mix in performance.

5. **The bedroom/day surgery/egg extraction.** This space features a bed with a hospital trolley on wheels, which contains syringes and props representing equipment for egg extraction, i.e. knitting needles, glass of red water with straw, golden wrapped Easter egg. The performer will explore the underlying scientific procedures in IVF egg extraction. She will demonstrate the hormones used for Follicle Stimulation, as well as the Ovum Pick UP (OPU) and Egg Transfer (E.T),

---

<sup>7</sup> Pharmaceuticals from IVF procedures include Puregon® and Orgalutran®, manufactured by Organon corporation, the Netherlands. Some of these pharmaceuticals are 'pharmed', i.e. involve the use of live animal products such as hamster hormones.

<sup>8</sup> DNA Sodium from Salmon Testes, Product # D126-1G, in fibrous form, is sponsored by Sigma Aldrich Pty Ltd.

<sup>9</sup> This is a replica of Pair #1 in the set of 13 human chromosomes, images taken from authors own Amniocentesis (genetic) test during pregnancy. The *ChromoKnit*<sup>TM</sup> trademark is emphasized to signify the branding and intellectual property issues surrounding genetic and genomic 'products' in the Biotechnology and 'Life Science' industries. The dolls are knitted by performer/artist Pamela Drysdale.

<sup>10</sup> Results of author's own Amniocentesis (genetic) test during pregnancy.

procedures common in IVF. A verbatim account based on interviews with IVF patients will give audience members the chance to assess the invasive or therapeutic nature of these processes and possibly see themselves as a subject of biotechnology. A demonstration of the full procedure will be undertaken using the *ChromoKnit Dolly*<sup>TM</sup> as a demonstration subject.

6. **Chill out zone/ interactive space.** This is a ‘chill-out’ space where the audience can relax on ottomans from Freedom furniture and look at the *BioHome*<sup>TM</sup> web site, play with the *BioHome ChromoKnit*<sup>TM</sup> music interactive Pd site, read a selection of printed material including reviews and articles. Displays three A1 size prints of wool fibres x 100 times<sup>11</sup> and view ‘Do-It Yourself’ DVD’s on DNA extraction and cell culturing.

At the web site there is a simple mechanism for the audience to record what excites and scares them about biotechnology. They will be able to record their response in written or recorded (sound) form. The writer will regularly edit these and place them on a web site within the exhibition.

At the *BioHome*<sup>TM</sup> *ChromoKnit*<sup>TM</sup> interactive music screen the audience will be able to ‘knit’ their own sounds in an interactive sound element.<sup>12</sup>

#### **PERFORMANCE STYLES /TECHNICAL ASSISTANCE IN PERFORMANCE.**

One performer plays all personas, with technical assistance from a video operator and a sound artist. The performer will transform into a number of ‘personas’ during the performance. The technical/laboratory assistant will run live video recordings, as well as assisting in experiments, crowd movement and audience participation. The technical assistant uses a live video feed to focus on products and procedures during performance

---

<sup>11</sup> Images taken by author using confocal microscope at University of Sydney School of Agricultural Science, facilitated by Pia Smith (PHD candidate)

<sup>12</sup> Utilizing recorded sounds from the SymbioticA ‘Wet Biology’ workshop, placed in ‘pd’ programme software to create computerized patterns based on a range of knitting stitches. Op cit. 5

as well as the performer's small hand movements associated with knitting DNA or wool, and facial expressions related to injections and body interventions.

Terumi Narushima plays the live sound-mix from her laptop computer using 'Pd' software. This takes place throughout the performance. The music will emerge more strongly when performer is in physical or practical activities, i.e. not delivering text. Sound cues from the Radio Play *The Woman Who Knitted Herself a Child*<sup>13</sup> that are used in the 'wished-for-child' segment and the composed sound from that play<sup>14</sup> which accompanies the 'Storyteller Persona' are also played using Pd software.

### **Persona/performance styles.**

#### **1. Scientist Persona.**

Demonstrates the laboratory procedures for extracting DNA, knitting with DNA and presents the Biotech display doll's house. Uses a 'sales pitch' like a 'celebrity TV chef' around these live demonstrations. Plenty of room for standup and audience participation and salesperson style. She also performs scientific procedures with puppets, i.e. demonstrates IVF on *ChromoKnit Dolly*<sup>TM</sup>. Typical dialogue, *'We are just going to do a simple injection today...'*

Signified by highly professional, presentational style in lab coat and gloves.

#### **2. The Stepford Persona.**

A naïve and eccentric housewife persona, inviting the newcomer into the space, exploring objects and products with a domestic simplicity and sense of kitsch. This persona speaks in second case, *"You can do this, you can do that"*. Or, *"You find if you clean up as you go, you feel a lot better about yourself during the day."*

---

<sup>13</sup> Broadcast Dec 19<sup>th</sup>, 2004, ABC Radio National 'Airplay'.

<sup>14</sup> Musical composition by Matthew Fargher.

This incorporates 'Crafty/creative' style. The woman is obsessive and gets carried away with craft decoration with wool and biotech containers and products, i.e. creating 'micro tube hangings' for *BioHome*.

Signified by highly personal quirky style. At times she drops into a personal space: talking in first person/normal voice, using small personal movement style.

Note that during the performance there is some blurring between the 'Scientific' and 'Stepford' personas, just as there is the blurring of lines between the home space and laboratory, which will intensify during the performance.

**3. Storytelling style.** As the performer knits she tells a version of the Bioethical fable, *The Woman Who Knitted Herself a Child* in first person.

Signified by knitting and also a 'gothic' lighting state where possible; dimmed lights and a single standard lamp which illuminates her face from below.

**4. The wished for child.** Voice-over from the radio play, *The Woman Who Knitted Herself a Child*. This signifies that the child is present either literally or metaphorically in the BioHome™ space.

**PERFORMANCE AT FCA GALLERY, FACULTY OF CREATIVE ARTS, UNIVERSITY OF WOLLONGONG, AUGUST 16<sup>TH</sup>-25<sup>TH</sup> 2006. ARTISTIC/COLLABORATION CREDITS:**

**Credits:**

Writer, performer, deviser, producer: Catherine Fargher

Direction and corporeal dramaturgy: Nikki Heywood,

Textual dramaturgy: Noelle Janaczewska, Merlinda Bobis.

Visual dramaturgy: Brogan Bunt, Virginia Hilyard.

Knitted elements: Pamela Drysdale.

Plasma Screen performers: Terumi Narushima, Catherine Fargher, Denise Cepeda.

Interactive sound creation: Terumi Narushima.

Composition: Terumi Narushima, Matthew Fargher, Ian Moorehead and Catherine Oates.

Video footage: Catherine Fargher, Virginia Hilyard, Cominos Zervos, Tim Watts.

Sound recording and sound editing: Catherine Fargher.

Sound operation: Aaron Hull.

Video editing: Catherine Fargher, Virginia Hilyard, Peter Oldham.

Web Design, Plasma Screen design, Logos : Jessica Ellis, Greg Clout and Robert Dinneville.

Design and technical support: Russell Emerson (University of Sydney Centre for Performance Studies) Didier Balez, Alistair Davies, Aaron Hull.

Installation space design: Catherine Fargher, Greg Clout, Jessica Ellis.

Production management: Jessica Ellis.

Documentation: Peter Oldham, (video) Russell Emerson (stills).

**Biological elements and collaborations:**

SymbioticA, UWA: Gary Cass, Oron Catts, Ionatt Zurr, Guy Ben-Ary, Jane Coakley;

UOW School of Biological Sciences: Dr Ren Zhang, Suresh Bhat, Sharon Robinson (Plant Biology), Associate Professor Mark Wilson (cell culturing) Pamela Morgan, Marie Dwarté; School of Biomedical Science, UOW: Melissa Errey.

USyd School of Ag Science: Pia Smith, Ivan Desailly, Colin Bailey.

**Technical and academic assistance:**

Faculty of Creative Arts, UOW: Brogan Bunt, Dr Merlinda Bobis, Aaron Hull, Dale Dumbleton, Olena Cullen, Craig O'Brien, Marius Foley, Grant Ellmers, Didier Balez, Jacqui Redgate, Alistair Davies;

**Sponsorship:** Eppendorf (John Lee), Invitrogen (Hanna Lampinen), Sigma Aldrich, Playworks Writers Workshop, Australian Network for Art and Technology (ANAT) .



PRE PERFORMANCE SET UP:

Entry area: lab coats, gloves, infra-red headphones, and ChromoKnit™ doll in package. Plasma display screen.

Kitchen area: Shower cap, gloves, water in jug, scissors, scales, pea seedlings, containers, micro tubes, sieve, centrifuge, crushed ice, ethanol, mortar and pestle, extraction buffer, pipettes, crochet hook or glass hooks. Live video screen.

Bedroom area: Sheets on bed. *ChromoKnit Dolly™* placed in bed.

Bassinette area: SP9 cells in vial, microscope, bottle of sf15 medium and muslin cloths.

Knitting area: Salmon DNA in small bar fridge, contained in knitting basket. Knitting needles and assorted wool in basket. *ChromoKnit Dolly™*.

Biotech dolls house area: small dolls, miniature *ChromoKnit Dollies™*, syringes, and hormone treatment drug boxes.

## **THE PERFORMANCE TEXTS.**

### WELCOME

SCIENTIST PERSONA and ASSISTANT encourage the audience to enter and watch the WELCOME SCREEN DVD.

### DVD CUE – WELCOME SCREEN DVD ON PLASMA SCREEN

Data screen video shows performer in SCIENTIST PERSONA welcoming the audience into the space.

#### Data screen voice-over.

*Welcome to BioHome™! In a few moments ladies and gentleman, you and your families will be able to enter the model biotech home and see the range of rooms and products that are on display for you today. We have a fully appointed kitchen, nursery, lounge room and bedroom, even a miniature biotechnology display home. Today you will experience the latest in biotech science as it meets the everyday technologies of your home. Explore the products on offer and make up your own minds! Feel free to experience ChromoKnit™ technology.*

*We think you'll agree that some of our products promise an amazing future for you and your children, but there are some traditional comforts as well. Take time to relax, interact and try things out, it's yours to explore. Please enter and enjoy BioHome™!*

SCIENTIST PERSONA and ASSISTANT appear outside the space to bring the audience in. They encourage the audience to enter the space. Once inside, the audience will be allowed to wander through the installation where a full safety procedure is played out over sound system.

SCIENTIST PERSONA and ASSISTANT hand out lab coats and gloves and help prepare audience for PC1 lab safety.

### Scientist Persona

*You will need to put on these lab coats and gloves in preparation for the PCI level laboratory procedures taking place in BioHome. Please listen carefully to the following safety precautions and make your way into the BioHome display area.*

### DVD CUE- LAB SLIDESHOW- SCREEN 1.

### SOUND CUE- SAFETY INSTRUCTIONS.

As the audience walks through the installation, an *Introduction to the General Rules of Safe Laboratory Conduct* is played. Slideshow displays a range of laboratory features, i.e. eye baths, dump showers, autoclave/biohazard bags. Audience is free to explore installation at this time. SCIENTIST PERSONA prepares for DNA extraction in BioHome Kitchen area. Puts her own gloves and coat on, and ties up hair in preparation for the experiment. She does this in a performative/practical style.

### Scientist Persona/Safety Voice-over

*Welcome to BioHome™. As you enter BioHome™, you will need to prepare for full laboratory safety, as we will be dealing with biotech-products including ChromoKnit™ technology. We treat every product as hazardous until we have a working knowledge of the product.*

- 1. Safety in BioHome™ is an individual and personal responsibility. A casual attitude should never be adopted. Always be conscious of potential hazards.*
- 2. Clothing suitable to laboratory conditions must be worn; e.g. closed shoes with non-slip soles, laboratory coats, etc. Thongs must not be worn. Gloves must be worn when handling corrosive chemicals. If you are*

*wearing gloves, remove them before you leave, if you have a hazardous chemical on your glove and turn the door handle, it may be passed on to someone else.*

*3. Never run in BioHome™ or along corridors.*

*4. Persons working in BioHome™ should make themselves aware of the positioning of fire and safety equipment within the room.*

*Fire escape routes must be kept clear at all times.*

*5. Washing facilities are available in BioHome™ and should be utilized after any BioHome™ operation.*

*6. NEVER allow toxic materials to get into the mouth or touch the lips  
NEVER pipette substances by mouth*

*NEVER sniff at possibly toxic substances (white powder in laboratories can be dangerous!)*

*NEVER store flammable solvents in a domestic refrigerator.*

*NEVER work alone.*

*7. Chemical Spillage. Regard all substances as hazardous. We are dealing with possible mutagens. Always work with the smallest possible amounts of chemicals.*

If possible Indicate dump shower slide

*If you are affected by a chemical spillage, Dump showers can deposit the equivalent of 20 litres of water in 2 minutes. Eye baths can wash toxic chemicals or contaminants that have spilt or sprayed into your eyes- your*

*partner in a team may have to lead you to the eye bath, even though they may be the person who accidentally sprayed acid in your eyes!*

8. *Biohazards. Biohazard bags are used to destroy any genetically modified organisms, which could contaminate other activities in the laboratory.*

*These are put in autoclaves- a giant oven, which heats things to a temperature that will destroy possible hazardous materials. We need to protect outside organisms as well. If aphids enter a biotech house or lab, they could take possible mutagens outside. GM material can escape.*

At some stage the SCIENTIST PERSONA enters the kitchen area, and begins to prepare for the DNA extraction, while the safety instructions are still playing. The kitchen unit will have a small set of seedlings on the bench top, as well as some kitchen containers and a centrifuge.

#### BUILDING BLOCKS OF LIFE.

SCIENTIST PERSONA introduces DNA isolation from plants. She chooses two participants to take part in the experiment.

LIVE CAMERA CUE- SCREEN 1. LIVE VIDEO OF THE EXPERIMENT IS PUT UP ON SCREEN.

#### Scientist persona

*This is the BioHome™ kitchen area. As you can see we're dealing with plant materials here, nothing too scary at first. Today we will be extracting DNA from these pea seedlings in a simple technique, which you will be able to do at home. I'd like two volunteers to assist in the experiment. You will be working in a team.*

*As the instructions indicated...another important aspect of lab preparation is grooming. The aim is to introduce as few contaminants as possible. I always use*

*good skin products to make sure my skin is not flaking. If our hair is long, we need to tie it back or wear a shower cap. Sometimes the thing most likely to cause contamination is ourselves.*

SCIENTIST PERSONA shows the moisturizer to camera. Offers it to participants. Offers a shower cap to any participant with long hair.

SCIENTIST PERSONA takes the audience through the following procedure. Throughout the experiment a running commentary can be maintained.

*Scientist persona*

- 1. Take about 0.5 g leaf material. Weigh this on a scale that has been zeroed. (If using Eppendorf mini micro tubes- take three leaves of plant material)*
- 2. Cut the leaves into smaller pieces and place them into a mortar. Add 2000P1 (2 ml) of extraction buffer, and grind with a pestle thoroughly to disrupt the cells and release the DNA. (If using Eppendorf mini micro tubes- take .5 ml extraction buffer and use the 'mini pestle' in the tube)*

*(During cutting of leaves) It's important to use young leaves, very fresh. Just the bits that are growing. Even if they're cut for a few hours the DNA starts to break down. Once a leaf has grown to full size, or a plant is old, it has stopped growing. The cells won't be splitting; there won't be much DNA. You can use young leaves from peas, nasturtium, tomatoes; the fresh vegetables from market where the vegetables are still alive, carrots in a bunch, or anything with the leaves still on.*

*Surprisingly, extraction buffer is simply a detergent to break down the cell walls; you can use a household detergent if you are doing this at home. You can even try to extract DNA from other foods at home- split peas, chicken livers, or bananas.*

- 3. Transfer the plant tissue and buffer to a 1.5 ml micro tube.*

*4. Centrifuge the tube for 3 minutes at high speed in a micro-centrifuge to sediment debris. The debris contains cell wall material and will pellet at the bottom of the micro tube. The DNA stays in the liquid above which is called the supernatant.*

*(During 3 minutes of centrifuging) You can do this at home too- push it through a muslin cloth or a wire mesh, or tea strainer. If you need to make a lot of DNA you can use a food processor.*

*DNA (deoxyribonucleic acid) is the hereditary material of an organism. These very long double stranded molecules contain many genes. DNA has been called the “building blocks of life.” The human genome has even been called “The book of life”, which indicates the powerful place this molecule holds in the 21<sup>st</sup> century imagination. Cambridge University scientists Watson and Crick discovered the double-helix shape of DNA in 1952.*

*Everything contains DNA: humans, herrings and hamsters. DNA bases C, G, T and A form pairs, that group together in ‘Codons’, which are equivalent to a sentence. Codons join together to form blocks of information that become distinct genes. These genes code for the expression of particular characteristics; remember one gene=one expression!*

*Once isolated and purified, the DNA can be used for further research such as cloning or genetic modification of plants and animals. Cloning plant DNA is relatively easy. We simply remove the nucleus of the female gamete and replace it with DNA we want to clone. Even cows and sheep are commonly cloned these days. Cloning a human is proving a little more difficult; no one can show conclusively that they have done it successfully. The two groups who do claim to have cloned a human are the Raelians, an organization associated with UFO’s and aliens and the Italian Scientist, Dr Severino Antironi, who claims to have*

*cloned two babies. For \$65,000 you could set up your own laboratory equipment to clone a human, but it would need to be placed on a boat at sea, in international waters, to avoid the various government bans on human cloning. It is currently illegal in most countries to clone a human.*

SCIENTIST PERSONA removes the micro tubes from the centrifuge and continues to assist volunteers with the experiment.

*Scientist persona*

*5. Transfer 300 ul (0.3ml) of the supernatant to a fresh micro tube, taking care not to disturb the 'pellet' of solid material that is left.*

*6. Add 800 u1 (0.8ml) of cold ethanol by carefully layering it on top of the supernatant.*

*7. Dip the sealed glass pipette or crochet hook up and down in the micro tube, gently mixing the alcohol with the supernatant. The DNA will precipitate as a white (or green), stringy mass which adheres to the glass rod.*

SCIENTIST PERSONA assists the volunteers to 'spool' DNA and shows the micro tubes with DNA to the camera for the live video feed.

After participants have extracted DNA, the SCIENTIST PERSONA moves to the front, picks up a falcon tube filled with blue/green water.

*Scientist persona*

*That's great, you're holding the building blocks of life in your hand.*

Performer takes off glasses, as if her eyes are strained.



SOUND CUE: LIVE SOUND MIX - SOUND CUE: #1 PBAD 4TRANSITION.

During this transition, the performer removes her glasses after noticing her vision is blurry, drops the tube and liquid, and then falls to the floor as if fainting, and spills large amount of green water. She reveals a highly personal space. She feels around for water. She mops up the water with paper towels from the kitchen bench, drips it slowly into the tube and then notices that the audience is there.

SOUND CUE: [CONT.] SFX: LIVE MIX #1 (FADE OUT VOLUME SLIDER)

Once the SFX end, the performer moves immediately into 'STEPFORD PERSONA'. She looks around the audience. Regains composure.

Stepford persona

*You find that if you tidy up as you go, you can feel a lot better about yourself during the day. Of course you can use almost anything in the biotech house for decorative purposes as well. These sieves could form a lovely flying wall frieze, and even the micro tubes can make lovely mobile for baby, jewelry, or Christmas decorations...*

STEPFORD PERSONA demonstrates the craft products to the audience. She helps someone try on the 'micro-tube jewelry'. Shows feature items to camera.

She indicates that the audience can move to the 'display room' performance area. She asks them to watch out for the wet area caused by the spilled liquid.

*You must be dying to see the rest of BioHome™. Do come inside. ... mind the water...it's a bit sticky around here, a bit slippery... mucousy. Please feel free to take a stool if you'd like to sit during the rest of the demonstration.*

SOUND CUE: MOTHERS THEME TRACK 2 'THE MARIGOLD HOUR'. (LOUD)

The STEPFORD PERSONA presents in a mock 50's style. She opens her arms wide as if to 'present' the home for the audience. The performer proceeds to present all of the different spaces in the house. She highlights the different areas as she moves around and tidies sheets, bassinette covers etc.

Stepford persona

*This is the bedroom/day surgery. Lovely curtains, for some private space!*

Wraps herself in a curtain (hidey game). Opens the curtain and reveals herself smiling to the audience.

*Product trolley...Temperature controlled bio-knitting basket... the miniature display house, bio-bassinette...*

Moves over to the bio-bassinette space.

SOUND CUE: SFX LIVE MIX (fade in): #2 pbad7

*It's great to have your bio-bassinette on wheels. They make it very easy for you to move it around the house.*

Performer moves the BASSINETTE and sheet around. Moves slightly towards KNITTING AREA.

*You can put it in a different room, you can hear it if the bio-baby needs you... Let's take a look!*

LIVE VIDEO CUE: SCREEN 2 CAMERA FOCUS ON DETAILS HERE.

SOUND CUE: [CONT.] SFX LIVE MIX (CRESCENDO)

STEPFORD PERSONA moves back the muslin wrap. Takes a peek. Pretends the bio-baby is sleeping. Places finger to mouth, hushing the audience. She is excited, complicit with the audience.

She feels the outside of the bassinette lovingly. Pushes back the muslin cloth cover. Reveals what is inside. Plays with the microscope; loves it, sensitively, like a baby. She moves the microscope arms up and down. Cleans it with the muslin cloth.

She picks up the vial of cells. Cleans it with the muslin cloth. Holds the cells up to the light. Plays with them. Looks. Gazes. Holds to cheek. This is the 'wished for' child. Baby hunger. Precious object.

Performer takes jar of Invitrogen™ sf9 medium. Feeds the cells using a pipette. Stirs up medium. Pipettes the medium as if she is feeding the cells. She gives a commentary after completing these practical jobs. Changes to SCIENTIST PERSONA.

### TRANSITION.

#### Scientist persona

*Today's bio-baby, little 'Thumbelina' is from a cell line of caterpillar pupae, or 'sf9' cells. Did you know these cell lines are immortal? Like bacteria and viruses, cell lines live forever! They just keep on reproducing. Only sexual reproduction leads to death.*

*Sf9 cells cost \$450 per ml. I keep these butterfly pupae alive with Invitrogen™ sf9 medium; it's a standard cell food with vitamins and minerals. The mediums used for mammalian cells - for instance mouse or human cancer cells - contain serum that is made from fetal calf placenta. The calf fetus does die in the procedure.*

*Selection of human fetuses for abortion based on gender or chromosomal abnormalities has increased with the spread of ultra-sound technologies and genetic tests. Unwanted daughters are being aborted at startling rates in China and across much of India, while the West is aborting more fetuses for chromosomal abnormality.*

*Little 'Thumbelina' needs feeding twice per week. When the flask is confluent, or full of cells, I place the cells into two flasks so they don't get crowded. I place one in this Eppendorf 'cell warmer', which keeps them at exactly 28 degrees C.*

*SOUND CUE: [CONT.] SFX LIVE MIX (CRESCENDO)*

TRANSITION.

Performer places the cells back under the microscope. Changes to STEPFORD PERSONA. Takes the muslin cloth and again cleans the whole microscope. Indicates to the audience the baby is sleeping now. She lingers over the cot, cleaning, watching.

She places the muslin over the bassinette frame and puts her finger to mouth again.

*SOUND CUE: [CONT.] SFX LIVE MIX (DECRESCENDO)*

Stepford Persona

*My little one's immortal, isn't that wonderful!*

Performer sings a lullaby 'Cotton Eyed Joe'<sup>15</sup>. She rocks the bassinette back and forth.

---

<sup>15</sup> 'Cotton Eyed Joe', is a traditional American folk lullaby, dealing with abortion. The term 'Cotton Eyed Joe' signifies the 'needle' used in back yard abortions.

*“If it weren’t for the sake of cotton eyed Joe, I’d have been married a long time ago, I’d have been married a long time ago.”*

Moves the bassinette back to the original BASINETTE position.

Stepford persona.

*When I’m knitting I like to keep the bio-bassinette nearby, so I can hear if Thumbelina needs me.*

Changes to SCIENTIST PERSONA.

DNA KNITTING 1.

Scientist persona

*Let’s open up the temperature controlled bio-knitting basket and see what’s inside.*

SOUND CUE: [CONT.] SFX LIVE MIX (CRESC.): #1 + #2 + #3 PBAD5

SCIENTIST PERSONA commences looking inside the knitting basket and picks up Salmon DNA in a small container.

LIVE VIDEO CAMERA CUE. – SCREEN 2 (CLOSE UP ON DNA)

*With the use of DNA strands, knitting can become more than a craft – it can become a living art form.*

*If you’ve tried Mohair, Angora, Homespun Alpaca, why not try DNA from calf thymus, salmon testes, arctic moss? With literally hundreds of DNA products to choose from the DNA knitter need never be bored!*

Performer prepares DNA on a plate, ready to knit it. Starts to take DNA from container and starts to splice and knit it. Changes to STEPFORD PERSONA.

### Stepford Persona

*Today I'm casting on DNA from salmon testes. This is a commercial product from Sigma Aldrich Corporation you can buy over the Internet. It costs \$160 per gram. You'll need to store it below 4 degrees C. It is a living product, so you do need to prepare for full PCI laboratory safety. It's a bit sticky and dissolves in water. You need to wear gloves so it doesn't stick to your hands as you knit it.*

*2, 4, 6, 8...DNA is made from 4 bases: guanine, cytosine, adenine, thymine. A bit like the four main knitting stitches, every living thing can be made from these four bases: plants, birds, reptiles, and mammals.*

*If you're knitting a child's leg say, you can cast on 24 stitches, then knit and purl rows if you want a ribbed look, or plain knit or purl for a more rugged look. Why not use any of the pattern stitches, fern stitch, herringbone, moss stitch, honeycomb for a 'special' effect. You can make all sorts of choices about what sort of baby you knit. If you want an innie belly button for instance, you might drop a few stitches, or add a few more for an outie, you can create all sorts of looks for the eyes, Asiatic, almond, button noses, black hair, blonde. It is wonderful, what you can do with a few stitches and a DNA product!*

*Today I'm knitting a doll.*

Performer cleans up the DNA, puts it back in fridge.

Stepford Persona

*We'll put the DNA away for now. It dries up if it's exposed for too long...  
...I'll demonstrate with 8-ply acrylic for you today.*

She starts to knit with 8-ply wool and as she does, assumes the position of the STORYTELLER. Moves the lamp light to below her face, making a ghostly gothic style illumination. Takes full focus; this is a chance for the audience to sit and listen. Draws people in. The story is delivered quietly in a singsong voice, as if this is a slightly scary lullaby she is singing to the audience.

LIGHTING CUE: END GENERAL LIGHTING STATE. DARKER STATE, LAMP UNDER CHIN.

LIVE VIDEO CUE: CLOSE UP ON KNITTING.

SOUND CUE: SFX: LIVE MIX 'TINY STITCHES' (RADIO PLAY) SOUNDTRACK.

STORY 1Storyteller Persona

*Now. Once I worked in the laboratory as a microbiologist with twenty other scientists. One night, I was working late, cloning the cells of animal viruses and waiting for them to multiply. I really hated waiting.*

*I hated waiting because it gave me time to think. I thought about a lot of things, especially the fact that while all the other microbiologists and geneticists or plasma-wave specialists had gone home to their families, I had no child at all.*

*I was a single cell, while all around me others were multiplying.*

*What did I do? I walked. I twiddled my thumbs, trum-te trum. But no amount of walking and twiddling made those cells divide any faster. I needed to find something to do to pass the time. I remembered the hobby I had loved as a child. I would start to knit.*

*I bought in the knitting basket my grandma had given me all those years ago. I began to cast on a few stitches. Clickety-clack.*

*Clickety-clack, clickety-clack, my needles clicked and clacked and I started to knit up all manner of creations. Snakes and rabbits, dolls and trolls.*

*It's true; I found this occupation of my fingers was creating a calming effect on my mind. In my reveries I dreamed up all manner of possibilities. I imagined myself as Marie Curie discovering her radium, Edison with his light bulb, or Crick and Watson with their DNA double helix. But most of all, the more I knitted and dreamed, the more I imagined I could create my own child.*

*SOUND CUE: [CONT.] 3 TINY STITCHES (CRESCENDO)*

*One night, when the full moon was gleaming through the plate glass windows, I was possessed by a strange whim and decided to knit a baby doll. I cast on two, four, six, eight, ten stitches, beginning with the hands.*

*SOUND CUE: [CONT.] TINY STITCHES (FADE OUT): STOP PLAY*

*LIGHTING CUE: MOVE LIGHT BACK TO GENERAL LIGHTING STATE.*

*TRANSITION.*

Performer becomes the SCIENTIST PERSONA. Picks up the BLUE CHROMOKNIT DOLLY™. All the props for the following operation/experiment are placed on the bedside table.

Describes the CHROMOKNIT DOLLY™, lifting it like a doll/puppet.

*LIVE VIDEO CUE: FOCUS ON DOLL.*



*Here's a dolly we knitted earlier. This is a ChromoKnit Dolly™. It's based on a human chromosome # 1, placed under a microscope. Chromosomes come in all shapes and sizes. Some pictures of human chromosomes are featured on the picture wall over here. (Indicates the framed pictures of human chromosomes) Some are like teddies, or tiny aliens. This one looks a bit like Marge Simpson, don't you think? These are the bands of genes, where you might find the coding for a particular characteristic, ...hair colour, nose shape, finger length, fish scales, if you're a fish! Or a mermaid perhaps? The propensity for certain diseases; breast cancer for instance. Remember 1 gene = 1 expression! Diseases are attached to particular chromosomes, for instance Downes Syndrome at #13, or Muscular Dystrophy, which is attached to the X chromosome, passed on by the mother...*

*Remember, ChromoKnit™ dolly is available after the demonstration, and comes with a unique read out of your own genetic profile. Scared of what your future holds? If it's not what you hoped for, you always have ChromoKnit Dolly™ for comfort.*

*Let's see what ChromoKnit Dolly™ can do.*

STEPFORD PERSONA walks the doll, step by step and sings Playschool song.  
Performer's head and doll's head move side to side.

*(Singing) Walking is as easy as your ABC, won't you come along and have a walk with me.*

LOAD SOUND: #3 PBAD6

EGG EXTRACTION.

Change to SCIENTIST PERSONA. STANDING TABLE AREA.

### Scientist Persona

*Here we are in the Bedroom/day surgery. This is a great place for undertaking any number of small bio- procedures. For instance Collagen transplants from respected bio- sources, or IVF procedures.*

*Today we're going to demonstrate a full IVF procedure with dolly. There are three main stages: Follicle stimulation, Egg extraction (or Ovum pick up, OPU) and Egg Transfer (E.T).*

### LIVE CAMERA CUE.- SCREEN 2. CLOSE UP OF PROCEDURE.

The Performer has a 'Play school' attitude, demonstrating to camera.

*The first stage in IVF is follicle stimulation.*

Rubs dollies legs together, looks a bit sassy.

*Typically, the ovaries are stimulated for the egg extraction procedure using a follicle-stimulating hormone, Puregon. (Zoom in on box) Puregon is made with recombinant gene technology, or combined genetic materials. For instance this product is made using a base of hamster hormone. This stops the follicles competing with each other and allows the largest number of eggs possible to be harvested. Typically, FSH is injected in your home 2-5 times a day for ten - fourteen days. Side effects can be bruising and nausea.*

### SOUND CUE: SFX LIVE MIX (MF): #3 PBAD6 (FADE IN)

Indicates injecting the dolls tummy with needle. Enacts sickness, as if she is going to gag.

*One, two, three four five.*

*Follicle stimulation can increase the likelihood of Ovarian cancer and rarely, but seriously, ovarian torsion can occur. This is an acute twisting of the ovaries, which can be fatal. (Twist dolly)*

*If follicle stimulation is successful, anything from 1-20 eggs can be picked up in a harvest.*

Walks around the table, puts down small needle.

*After the follicle stimulation, it's time to have eggs harvested in an Ovum Pick Up, or OPU. This is stage 2. We'll move to the day surgery area.*

Continues to sing playschool song while walking doll.

*(Singing) ABC, 1,2,3 that's right...*

Performer 'walks' the dolly to the bedroom/day surgery area. She moves the trolley with needles etc. to be close to the bed. Performer sits down with the *ChromoKnit Dolly™* on lap. She uses it as a puppet to enact the egg extraction. The performer is both operating on the dolly and reflecting dolly's feelings.

Lays *ChromoKnit Dolly™* back on lap.

#### *Scientist Persona*

*Sit back. Get comfortable. That's good!*

The performer is speaking in a normal voice here, quite personally, as if she is telling a story to the doll. Blurring between personas here.

*You're in the waiting room in a gown. You're preparing for your OPU. A lot of other couples are waiting as well; or a single woman with a friend, perhaps a lesbian couple. You hear their low voices on either side of you.*

*In the next room the three fates are waiting to cut, spin and measure your destiny. Three fates in the shape of nurse, anesthetist and head scientist.*

Sits down and places dolly on lap. Enacts syringe. Places feet on small trolley.

*Now you can go in for the procedure.*

*Lay back on the bed!*

*Time to put the feet up in stirrups.*

*First you have a pethadine injection,*

*You'll feel a little drowsy...*

VIDEO CUE: CLOSE UP ON FACE.

SOUND CUE: [CONT.] SFX: LIVE MIX #3 HERRINGBONE (CRESC /DECRESC.)

Performer laughs spontaneously. Throws head back.

*The lights are really bright!*

Slowly adjusts and returns to focusing on next procedure.

*Now you have the local anesthetic in the vaginal area, this might sting ...*

VIDEO CUE: CLOSE UP ON DOLL.

Injects *ChromoKnit Dolly*<sup>TM</sup> with knitting needle/syringe again in the vaginal area. Performer responds with slight intake of breath, surprise.

Ooo, ouch...

Performer picks up knitting needle to enact 'Ultrasound probe'.

*Now you have the ultrasound probe to 'pick up' the ovum. This has a long needle in the centre, about thirty centimetres long. It goes through the vagina, cervix, uterus and fallopian tube until it reaches the ovaries, taking care not to pierce any blood vessels as it goes through.*

Performer enacts insertion of knitting needle as 'Ultrasound Probe' in doll's vaginal area.

*(Hold image for camera) Then the ultrasound probe goes in and you're looking at the ultrasound of the ovaries on the monitor, and you're watching the needle harvests the eggs. There are long tubes coming from the needle full of pink liquid, blood and fluid. We're looking for the egg... looking for the egg...*

Performer drinks from a glass of pink liquid, making gurgling and popping sounds.

SOUND CUE: [CONT.] SFX: LIVE MIX #1 (BRIEF BUBBLES)

VIDEO CUE: CLOSE UP ON LIQUID AND STRAW.

Makes a lot of bubbles at end. Bursts up for air, excited to have the egg.

*There's the egg!*

**VIDEO CUE: CLOSE UP ON EGG.**

Picks up the golden wrapped Easter egg from pocket. Places in small plastic container.

*It's handed to the scientist and she's placing it inside the sterile area. She's putting her arms in through the covered gloves and she's manipulating the egg with the pipette. She's washing the egg by pulling it up a couple of times into the pipette and she's placing it in the Petri dish. She's placing it under the microscope, attached to the TV monitor.*

*You see the egg on the screen like it's right in front of you. It's huge like a rising sun, a big golden egg. It's a highly mediated experience. The egg is 20 cm on the screen, when in reality you can fit many onto a pinhead...*

**SOUND CUE: SFX: LIVE MIX KNITTING/MOSS PATTERN SOUNDTRACK.**

Images on screen here. Performer places golden Easter egg in small container,

TRANSITION. *Reading data on folder.*

**VIDEO CUE: CLOSE UP ON EGG IN CONTAINER.**

Tidies up the side table. Replaces cap on needle.

Returns to SCIENTIST PERSONA. Gets 'folder' containing sperm donor profiles from the end of trolley.

*Scientist persona.*

*If the egg extraction isn't successful, there are many possibilities for buying an egg, if you move out of this country. Selling an egg in this country is illegal, though you can give one away to a person or to science. You can buy human eggs from a clinic in South Africa, Russia, Greece or Spain. The prices range from \$20,000 for the most expensive in South Africa down to \$5,000 in Russia. Interestingly, Russian eggs are normally expensive...caviar...Faberge. In comparison human eggs in Russia are cheap. I'm not sure if it's the exchange rate or because they're not so popular. If you're keen to go on a holiday to any of the locations, you may need to consider price and the politics of the country, as well as genetic considerations.*

*IVF and donor egg procedures are becoming popular reproductive choices in both the developed and developing world.*

*Alarmingly, in developing countries, thousands of women die every year from illegal back yard abortions, due to US funding prohibitions on Women's' Health Organizations which provide legal abortions.*

Has a drink.

*Sperm can also be purchased over the Internet, from the many 'Cryobank's' that exist. Typical donor profiles include the age, height, sports, and academic interests. We have the BioHome Cryobank's profile sheet here in case any of the students in the audience are interested. In some cases, such as the Scandinavian Cryobank, all donors are required to be over a certain height, and to have blonde hair and blue eyes. This sperm is sought out throughout the western world and can be ordered over the Internet. This prompted a newspaper article titled 'The Vikings are taking over the world'.*

**TRANSITION.**

Performer tidies up the side table. Replaces folder. Checks egg. Replaces cap on needle.

SOUND CUE: [CONT.] SFX: LIVE MIX (FADE OUT & "0" AFTER TINY STITCHES)

Moves to central chair. Sits down at KNITTING AREA. Reaches for knitting again.

Starts to cast on. Goes into STORYTELLER persona.

LIGHTING CUE: BELOW FACE.

VIDEO CUE: CLOSE UP ON KNITTING.

SOUND CUE: 3 TINY STITCHES (FADE IN)

**STORY 2.****Storyteller Persona**

*Where was I? Have you ever stayed up knitting, night after moonlit night? Have you watched strange shapes appear out of the corners of your eyes, have you heard noises or smelt strange smells? This is what started to happen to me. The whole laboratory seemed to dance to a strange beat.*

*The wool curled around the needle and my arm, it snaked through the air and twisted around my Petri dishes, scooping up the cells, forming shapes that I didn't recognize. Tiny blobs which resembled the buds of limbs. A long chain stitch like the glimmer of a spine. I cleared a corner of the bench and started to assemble six jars, one for the buds of tiny hands, one for the blinks of the eyes, one for the downy hair on my baby's head...*

LOAD SOUND: #3 PBAD3

*In the months that followed the frenzy continued. I no longer returned home and every night I knitted. My child had begun to grow.*



*One night, I saw that my child was nearing completion. Hanging in the glass vials were two small arms, two legs, a torso, a rather sweet face and bottom of plump proportions.*

*I gathered all the limbs together in my arms and placed them lovingly on the bench, ready to stitch the pieces together. I felt their trembling aliveness. All of a sudden I had no doubts, no fears. I moved almost like a woman possessed. I took the needle I used to assemble the pieces of my knitting, With nimble fingers I pierced the skin with the needle and started to join the limbs to the torso, the ears to the head, the head to the body and so on. I looked out of the window and saw the sun rising.*

*SOUND CUE: [CONT.] TINY STITCHES (CRESCENDO)*

*I placed what was in my arms on the ground, and there before me stood a little child, quite perfect, with dark hair and eyes, immediately giggling and laughing as it ran about the laboratory, chasing and hiding.*

*I only half heard the door open as my colleague entered the room.*

*“Cecilia, haven’t you been home yet?” my workmate said, smiling. “ What have you knitted up this time?”*

*“ Not knitted this time,” I said, beaming, “ look at my beautiful baby!”*

Holds up knitted body and hold in front of face.

*SOUND CUE: [CONT.] TINY STITCHES (FADEOUT/STOP)*

*SOUND CUE: 5 I’VE GOT LIMBS WINDOWS MEDIA PLAYER (LOUD)*

Sound space immediately becomes active. Performer starts to wind up wool, packs up the space, Takes off the hat, gloves and lab coat to become STEPFORD PERSONA (personal).

V/O Wished for Child:

*I've got two legs, two arms, a head, two ears, two eyes, one blue, one black... I've got some hair, ten toes, ten fingernails and a bottom. (Giggles) It needs a bottom. (Giggles) What else will I put the nappy on? (Sing song). I'm stitching her together. All done! My baby is finished!*

Becomes alert to audience, becomes STEPFORD PERSONA.

Takes the egg from the container and begins to unwrap it as she introduces the Egg Transfer process. Unwraps it as she explains egg implantation. Speaks to Camera. Standing at first.

VIDEO CUE: FOOTAGE OF FACE CLOSE UP. SCREEN 2.

Stepford Persona.

*If the extraction is successful, we move on to Step 3 of the IVF procedure. Egg Transfer (ET). The egg goes off to the lab, and within four hours it will be fertilized with donor sperm or your partner's sperm and if it fertilizes it becomes a blastocyst, and within 2-3 days you can come back for your egg transfer or ET. We'll go back into the day surgery area.*

Sits on day surgery bed. Has curtain pulled, face to camera only. Eats the egg.

*Once the egg is transferred to the uterus, it's a relatively simple procedure with two more hormone injections. You'll know by the end of your cycle if it's worked or not. (Pause) I really hate waiting. It gets harder every month. I do things I never thought I'd do, inject myself with things I've never heard of, I don't know where they're from. The line...what you find*

*acceptable to do with your own body, keeps changing. You don't want to admit how desperate you are... how much you want a baby.*

Picks up syringe, mimes pulling the curtains around. Returns to SCIENTIST PERSONA.

*SOUND CUE: [CONT.] SFX LIVE MIX #3 HERRINGBONE (CRESCENDO)*

*As you can see, the procedure is quite an ordeal. I am going to give the dolly some more pethadine; you can't come in for a minute. Would you please wait outside? (Turns face to audience here)*

(To Doll) *You can relax now, it's all over...*

*SOUND CUE: [CONT.] SFX LIVE MIX #3 NORMAL (CRESCENDO)*

Performer drops the doll and needle, leans on bed. Intimate personal movements here, in the view of the video camera. She strokes the back of the neck and head with one hand, soft, slow, detail here, tiny finger movements. Plays with hair, internal images, imagine stroking baby hair.

TRANSITION.

When performer gets up she collects the doll and the needle, collects the lab coat from the back of the chair, and puts it on. She slowly gathers that there is an audience still present. Is still a bit dazed from the pethadine experience. Adjusts.

*SOUND CUE: [CONT.] SFX LIVE MIX (FADE OUT ON PD MASTER VOLUME)*

Stepford Persona.

*You're still here! Thanks so much for visiting, I hope you've enjoyed the home hints I've been giving you and the demonstrations. I do have several*

*of the decorations for sale. In fact the whole house is for sale of course except for my precious little Thumbelina.*

Indicates to the audience the laptop where they can leave interactive voice message.

*If you'd like to leave us a special message in the visitors' book, or record a voice message, tell us what excited you and what frightens you about Biotechnologies. It's right there in the 'chill out' lounge, on our web site. If anyone would like to do a little plant DNA extraction, see me after the show. And don't forget, ChromoKnit Dolly™ is available after the demonstration. Thanks once again for visiting!*

*SOUND CUE: 2 MARIGOLD STEPFORD (LOUD)*