University for the Creative Arts
Research Project Portfolios

Stem

By Kathleen Rogers

Project Details

Name of Researcher:	Professor Kathleen Rogers
Name of Output:	Stem
UCARO link/s:	https://research.uca.ac.uk/view/projects/Stem.html
Output Type:	Q – Digital or Visual Media; multi-component output comprising video artwork and series of photographs
Collaboration:	The work draws on Rogers' EPSRC Pathways to Impact Arts Residency in the School of Medicine, Faculty of Medicine, Health and Life Sciences, University of Southampton (January 2013 – January 2014). The research was produced in association with Professor Richard OC Oreffo and the Bone and Joint Research Group at the Centre for Human Development, Stem Cells and Regeneration, Human Development and Health, Faculty of Medicine.
Year and mode of dissemination:	Work from Rogers' residency first came into the public domain in 2015. VIDEO INSTALLATION AND PHOTOGRAPHIC SERIES *Art and Human Enhancement* group exhibition, Museu da Cidade de Aveiro, Portugal, 7 – 12 October 2015 *Matter and Media of the Invisible: The Archaeology of Memory* group exhibition, Museu de Penafiel, Portugal, 12 March – 11 April 2016 PHOTOGRAPHIC SERIES *The Enhanced Human / Convergence* group exhibition, I3S Scientific Research Institute, and concurrent *Enhancement: Making Sense* group exhibition, Public Gallery I3S Instituto de Investigação e Inovação em Saúde, University of Porto, Portugal, 25 May – 25 June 2016

Project Details

Description of the works:	VIDEO WORK The Fate Maps: Acts 000 - 006, HD six-channel video (colour) sound installation, LED monitors and media players, wall mounts/TV exhibition stands, follor speakers (subs), headphones, loop. Various alternative installation scales and layouts for single channel or multi-channel video projections. Rogers' video work is designed as a multi-screen, 6 channel video and sound installation/6 × 3.10 mins, HD videos, continuously looped for projection or flat screens. Each channel represents the following episodes: 001 – MATTER 002 – VASCULAR 003 – VISCERA 004 – OSSIFY 005 – PRIMORDIAL 006 – LACUNAE PHOTOGRAPHIC WORK The Fate Maps: Cuts Nos 1 - 3, series of 15 (black and white) inkjet prints, hahnemuhle German etching, framed, 210 x 297mm, 5m installed
Key Words:	Film, photography, installation, post-humanism, biopolitics, new materialism, Anthropocene
External Funding:	The Pathways to Impact residency in the School of Medicine at Southampton University was part of an EPSRC funded project: original research EPSRC - £15000 14th International Meeting of Art and Technology - £500

Synopsis

‘Stem’ is a research output by Professor Kathleen Rogers comprising a video installation and series of photographic works. It has been disseminated through three exhibitions.

The practice-based research explores the conceptual and visual expression of stem cells in regenerative medicine. The research is based on Rogers’ residency with the Bone and Joint Research Group at the University of Southampton which enabled her to have significant engagement with scientific research into embryonic and adult stem cell tissue engineering and cell regeneration. The ‘Stem’ project is a response to these subjects.

Rogers’ video and photographic work represents donor materials of embryonic, fetal and adult body material and stem cells gifted to the research group for multi-disciplinary investigations into cell biology, biophysics, biochemistry and functional genomics. The work includes macro-photographs of donated tissue, a mature umbilical cord, syringe extraction of cells from the fetal cord, arthritic hip bone, frozen bone marrow, bone cells under a microscope and nano-surfaces in culture wells.

The work was exhibited first at the Museu da Cidade de Aveiro, Portugal in the context of themes drawn from the 14th International Meeting of Art and Technology: *Art and Human Enhancement*, to which Rogers was invited as keynote speaker. The work was subsequently shown at exhibitions in the Museu de Penafiel and University of Porto, Portugal.

The supporting information provided outlines the research context, aims and processes underpinning ‘Stem’ which led to new insights. It includes the research as a number of video stills and close detail of the photographic works, as well as a PDF of the exhibition installation outline. The video works are also provided, and should be viewed alongside the supporting information.

Video Installation
Still from Screen One: Matter

Video Installation
Still from Screen Two: Vascular

Video Installation
Still from Screen Three: Viscera

Context

Professor Kathleen Rogers is an interdisciplinary artist and researcher working at the interface of the arts and sciences, exploring themes of posthumanism and the impact of contemporary biosciences on human identity.

The ‘Stem’ research project draws on posthuman and new materialist theory to address the fundamental phenomena of stem cells. A stem cell is a tiny piece of pluripotent matter, a source of chemical and physical possibilities, able to exhibit trajectories of growth to become any of the different kinds of cells/tissues of the mature differentiated organism. Stem cell research has potential applications within genome editing, thereby raising ethical and philosophical questions about subjectivity, the body, individuality, and how culture, history and the environment are expressed within human bodies.

Rogers’ conceptual approach is drawn from the work of theorists including Barad (2007), Bennett (2010), Stengers (2010), Braidotti (2013) and Haraway (1997), addressing how our being is trans-species, embodied and embedded in the planetary symbiosis. Her practice-based research builds a case study for vitalist materialism and Stengers’ Cosmopolitics. The work intersects with theories of new materialisms and Bennett’s themes of vibrant matter that explore the science and philosophy of the organism and “vital materiality” and “vital materialism” running through and across both human and non-human bodies.

Rogers’ practice incorporates research themes that explore the indivisibility of the quantum of action and data of experience. It draws on the application of diffractive methodology in Barad’s agential realism, interpreting quantum physics research in ways that allow access to a wider set of enacting forces to be considered in the analysis of phenomena. The creative practice and interdisciplinary context develops a conceptual and aesthetic approach that alludes to emergent phenomena that intersect with the nature of scientific and artistic experiments that have no naturally defined beginnings or endings.

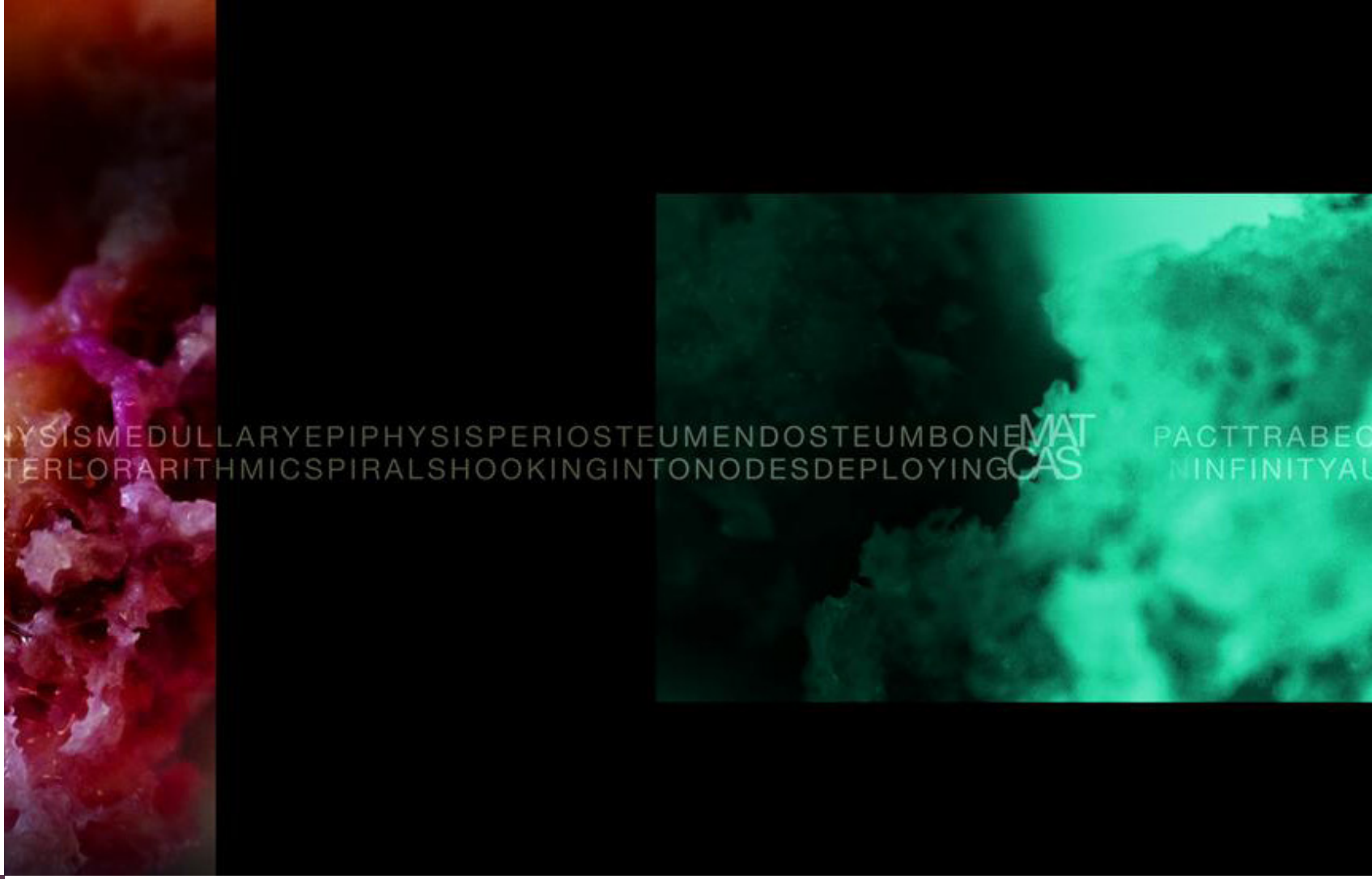
‘Stem’ thus demonstrates the ways that art-based research responds to the conceptual challenges of interdisciplinary taxonomic visualization and translation practices within contemporary biomedicine. In doing so it contributes to the public understanding of stem cell and regenerative medicine research.

REFERENCES

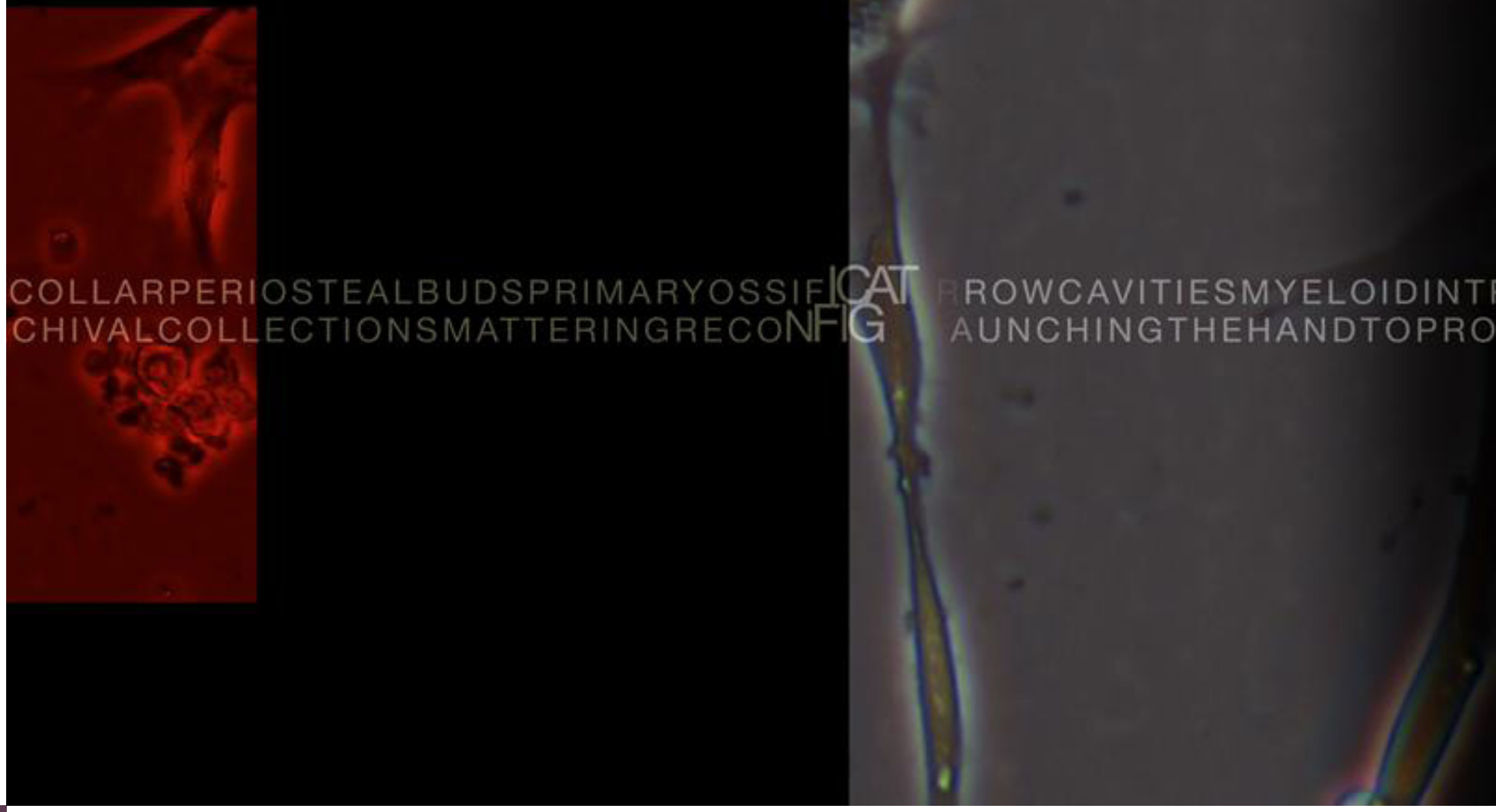
Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.
Bennett, J. (2010). *Vibrant Matter: A Political Ecology of Things*. Durham, NC: Duke University Press.
Braidotti, R. (2013). *The Posthuman*. Cambridge, UK: Polity Press.
Haraway, D. (1997). *Second Witness@Second Millennium, FemaleMan© Meets OncoMouseTM*. New York: Routledge.
Stengers, I. (2010). *Cosmopolitics I*; (2011). *Cosmopolitics II*. Minneapolis, MN: University of Minnesota Press.

Questions and Aims

Research questions:	How might research through art, in thinking “in-between” categories, usefully present the paradoxical nature of subjectivity, intuition and intentionality? How could this research reveal the hidden processes and tacit acts, and cut across the multiple and entangled ethical realities, proposed by Barad’s reading and interpretation of Niels Bohr’s pioneering work on quantum mechanics?
Research aims:	To engender public engagement with biotechnological, stem cell and regenerative medicine research. To draw attention to the impact of these life sciences on human identity, culture and society. To advance scientific practices and provide a stream of new epistemic objects that are in the public sphere but circulate beneath the surface for ethical consideration. To explore what is unique and relevant in the contribution of the arts that is inextricably linked to paradigm shifts brought about by advanced technology and contemporary science.



Video Installation
Still from Screen Four: Ossify



Video Installation
Still from Screen Five: Primordial

Video Installation
Still from Screen Six: Lacunae

Research Methods and Process

Rogers' practice assembles and disassembles the framing apparatus for theories of knowledge. She draws on Barad's metaphysical framework, Agential Realism, and is influenced by the systemic representation of experimental results in quantum physics research over the past decades that provide new insights into the nature of causality, identity and nature.

VIDEO WORK
The work is designed to create an immersive, sceno-graphic landscape to provide a reflective space for poetic contemplation. Rogers applied sophisticated motion graphic and dynamic text devices to images of donor materials collected in the context of her stem cell laboratory residency. These are layered and structured to compose pages with synchronized shadows and lines of letters that form words. There are no spaces of punctuation and the compositions metamorphose and transform into shadowy visual and textual correspondences. The aesthetic form builds bridges between the reader and the viewer who must co-create the work as the eyes see more latent meaning as the moving pictures unfold in time and space.

The structural grammar of Rogers' work was inspired by the metaphysical theories of Barad. Inspired by her concepts, Rogers explores the use of image and text layering methods to examine how time-based, visual and linguistic systems can regulate and dictate interior and exterior perspectives of objects. Rogers used continuously emerging streams of letters to form random words in ways that metaphorically refer to the unpredictable fates of stem cell-derived populations in host bodies and stem cell plasticity, integration, development and function. Dual streams of words composed from descriptive notations, poetry and genetic science are used to suggest parallel cognitive domains. The work exploits imagistic repetitions, tonal variants, scale and magnification to create a contemplative space. Virtual/digital shadows and a sound composition of visceral irregular heartbeats are used to invoke the infinite levels of reproduction of living cells in the human body.

PHOTOGRAPHIC WORK
Rogers' photo essay work offers reflections on ethically controversial areas of stem cell research within regenerative medicine that uses maternal donated tissue as a source of stem cells. It takes the form of a black and white photographic narrative image series presenting a clinically donated human umbilical cord as an ethically problematic epistemic object.

The images are gradually de-focussed, dissolving to black. Lower captions reference systemized and de-humanised measurement and cataloguing methods of clinical science. Photo and caption juxtapositions conceptually echo and explore the framing of female absence and raise questions about the political and ethical status of the orphaned subject.

Research Insights and Contribution

Rogers' research process, working *in-situ* in the science lab, allowed for a unique construction of form and content, furthering an understanding of the intersection between the arts and sciences. For example, during the residency insights were gained into shared responsibility in the negotiation of ethical tensions and procedures when using human donor materials as the source material for artwork. The creative research outcomes of the project then allowed for poetic and emotive insights into the hidden, ethical and tacit aspects of stem cell research that intersect with the impact of human genome sequencing. The work offers new methodological approaches and representational strategies in arts research to reveal common parallels and intersections between emerging posthuman theory, new materialisms and contemporary science.

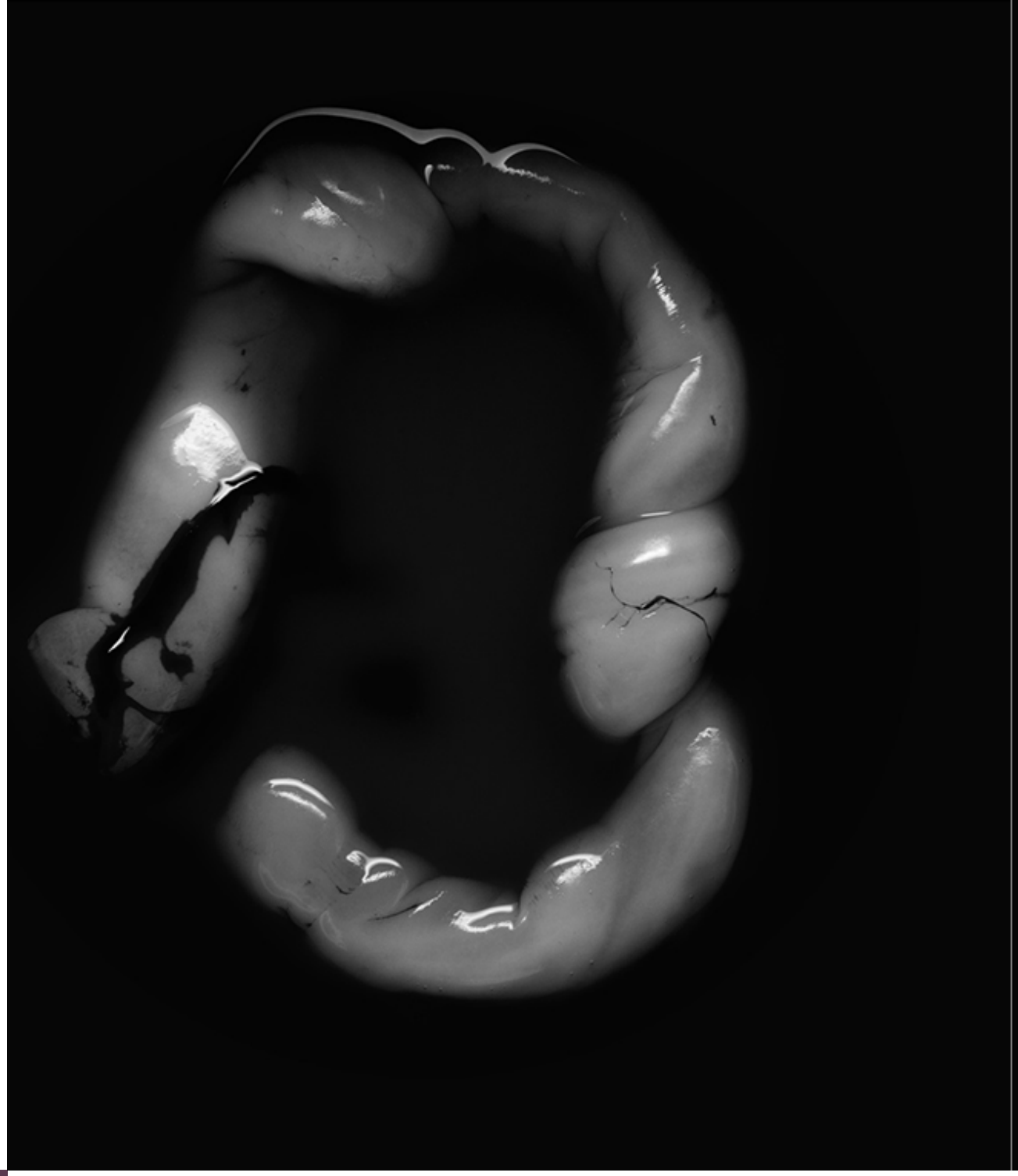
Rogers' research also contributes to wider debates on the meaning and impact of stem cell research in culture and society. In particular, the processes of explanting cells and tissues, transgenic technologies and stem cell tissue engineering have deep moral and ethical implications for the meaning of human identity. Rogers' visual approach opens up ethical conversations and questions around regulation in stem cell clinical research which present dilemmas in terms of public engagement. The outcomes present ways that artist researchers can work within these interdisciplinary contexts and still retain artistic freedom in their creative methods. The work demonstrates ways to build public awareness whilst acknowledging researcher privacy; to sustain confidence in the research whilst understanding the ethical issues; to work in collaboration with busy researchers whilst also cautiously skirting unpublished intellectual property.

Lastly, the 'Stem' research provides insight into the fact that science communication is not a one-way system, and so stresses that it is important to consider and integrate subjective experience into its frameworks.

Research Dissemination and Recognition

Dissemination:	2015: The *Art and Human Enhancement* group exhibition accompanied the 14th International Art and Technology Meeting (#14.ART) conference, focused on intersections and relations between art, science and technology within contemporary culture. The event drew international delegates and students with city wide exhibitions. Rogers was invited to deliver the keynote presentation, 'Cosmopolitical Futures, The Anthropocenic Human in the Stem Cell and Regenerative Medicine Space', which addressed the biological phenomena of stem cells in the regenerative medicine space and themes of the Anthropocene. 2016: *The Enhanced Human* was an international group exhibition within a large research centre at the University of Porto. The foyer public gallery space within this transdisciplinary research institution engaged in knowledge translation between arts, biomedicine and molecular sciences. The exhibition was organised by the knowledge transfer team Science in Society, with a focus on education. Public talks and tours were provided by curators and members of the public, students and researchers.
Follow-on-activities:	This evolving art based research and its themes led to a new exhibition and published paper for the International Art and Technology conference (#18.ART) *The Admirable Order of Things: Art, Emotion and Technology* in Lisbon 2019. This latest research work, 'Remembering the Unknown, Writing in the Body, The Dark Matter of the Genome', is a body of work that intersects with autoethnographic methods, biosocial theory and molecular epigenetics. The exhibition of video work, an essay and presentation abstract are documented and published in the conference proceedings, 2020 (ISSN: 2238-0272).

Photo Installation
Wall layout for exhibition



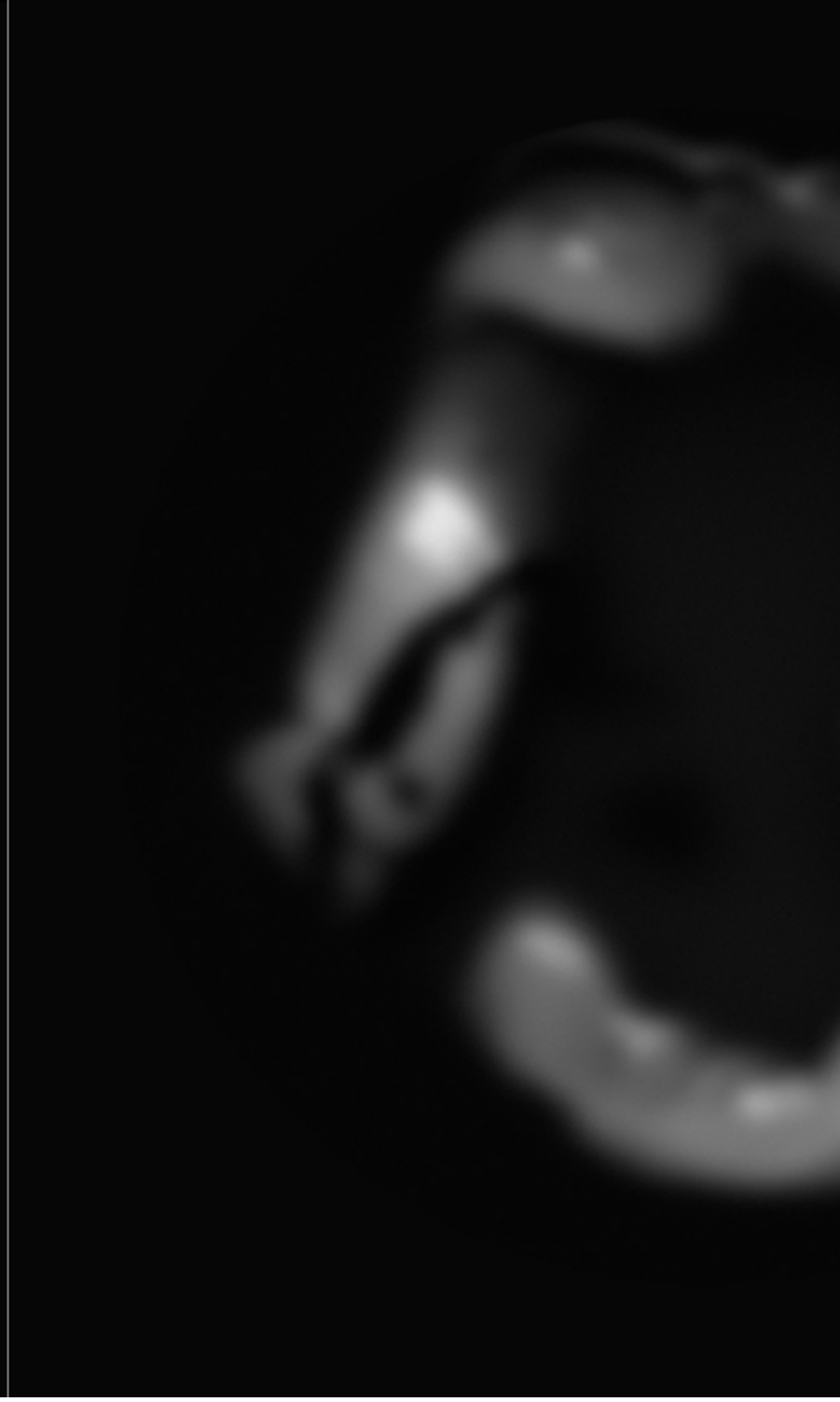


Photo Installation
Close detail of two of the photographs within the series 'CUTS - FATE MAPS + VOID'

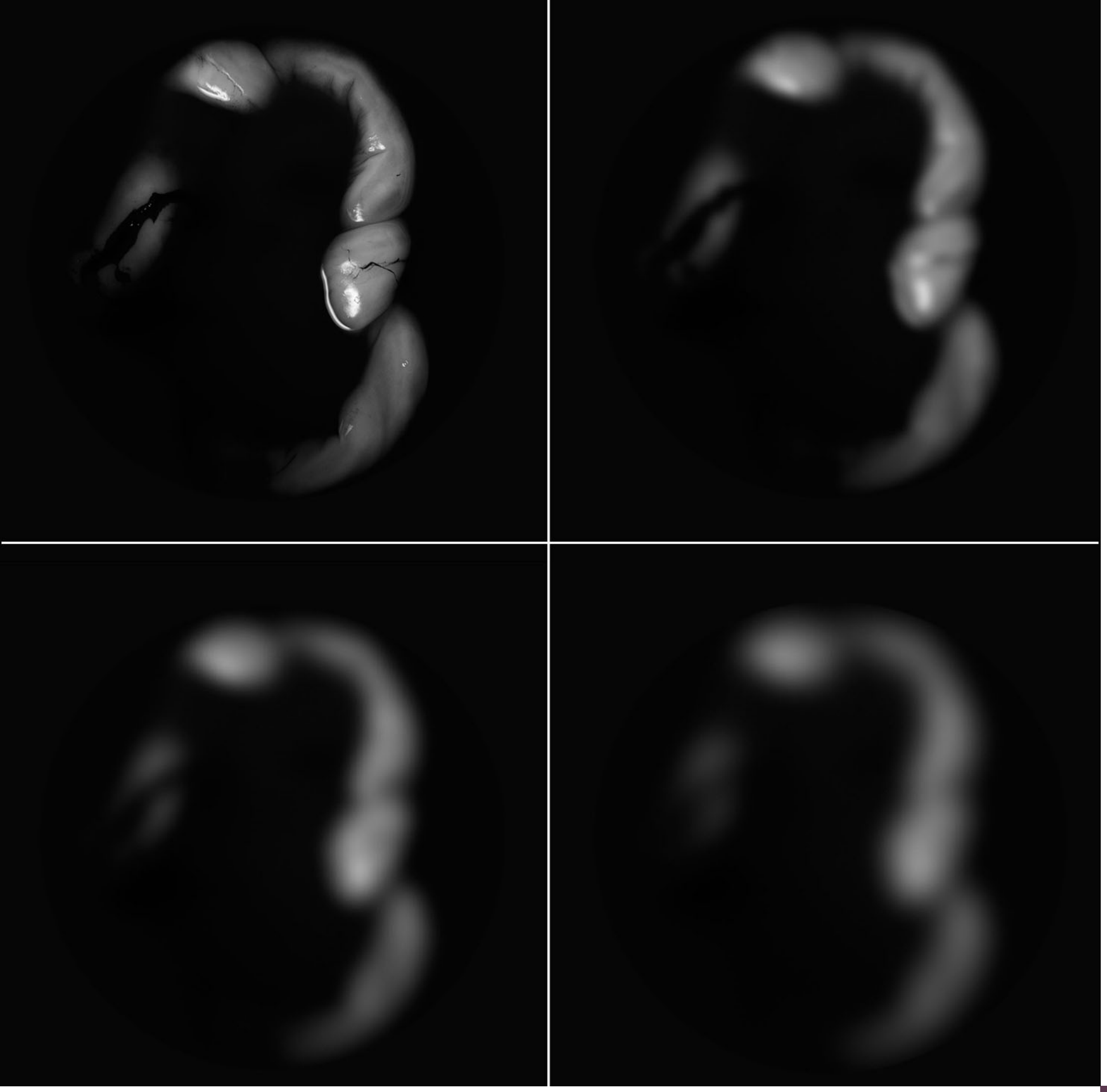


Photo Installation
Close detail of four of the photographs within the series: Cut no.1 fate map 01 fate map 02 fate map 03 fate map 04

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Graphic Design: Studio Mothership

FRONT COVER
Video Installation
Still from Screen Two: Vascular

BACK COVER
Video Installation
Still from Screen Three: Ossify


NVIRONMENTSSKELETALPROGRAMECARBONATECANCELLOUSCOMPACTTR
GTOWARDSTENSIONLIMITANEWDIVSIONANDTWONEWPATHSANDSOONINFIN

The Anthropocenic Human in the Stem Cell and Regenerative Medicine Space.

KATHLEEN ROGERS

VIDEO INSTALLATION OUTLINE COSMOPOLITICAL FUTURES

Professor of Media Arts and Science, University for the Creative Arts

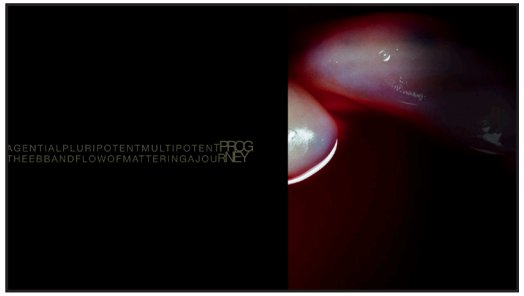
Produced in association with Professor Richard OC Oreffo and the Bone and Joint Research Group at the Centre for Human Development, Stem Cells and Regeneration, Human Development and Health, Faculty of Medicine, University of Southampton. Artist in Residence, Pathways to Impact, Engineering and Physical Sciences Research Council

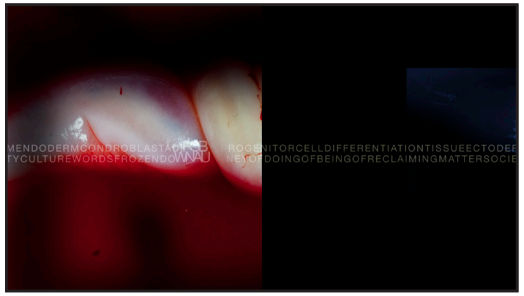
INSTALLATION OUTLINE

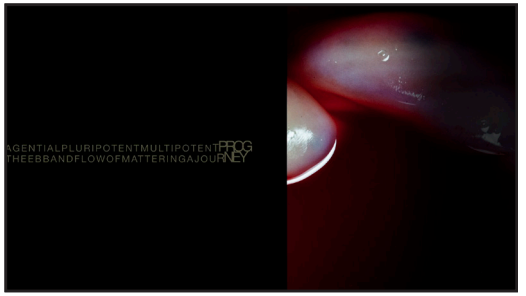
Multi-screen, 6 channel video and sound installation/6 x 3.10 mins, HD videos, continuously looped for projection or flat screens.

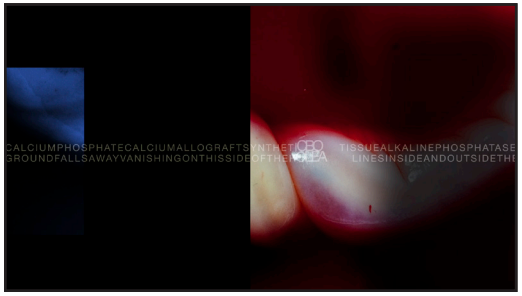
SCREEN 1 - MATTER
SCREEN 2 - VASCULAR
SCREEN 3 - VISCERA
SCREEN 4 - OSSIFY
5CREEN 5 - PRIMORDIAL
SCREEN 6 - LACUNAE

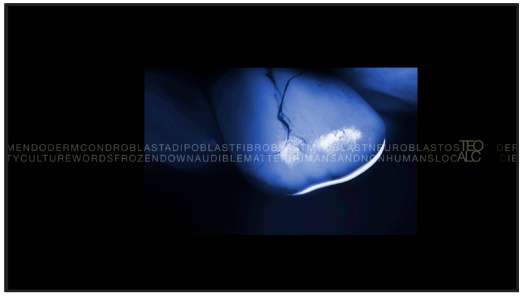
MULTIPLE video projections/SCREENSproduce an immersive, scenographic landscape. Viewed in partial darkness, the work provides an audience with a reflective, EVOCATIVE SPACE FOR CONTEMPLATION.











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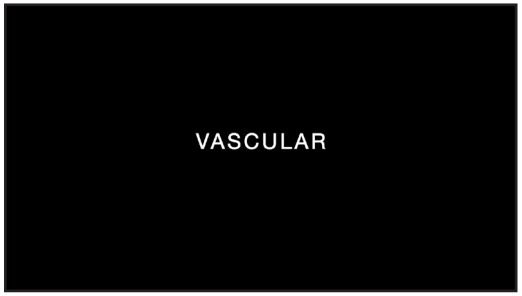
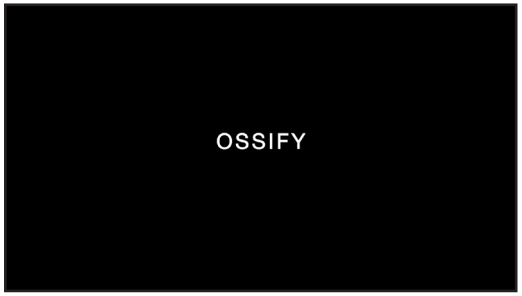
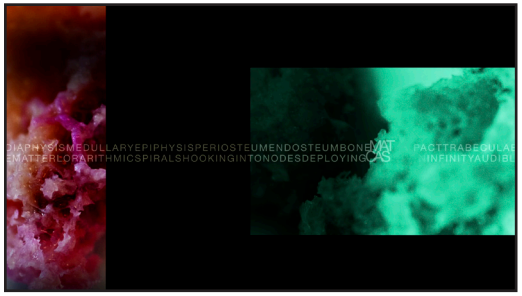
Screen stills, MATTER

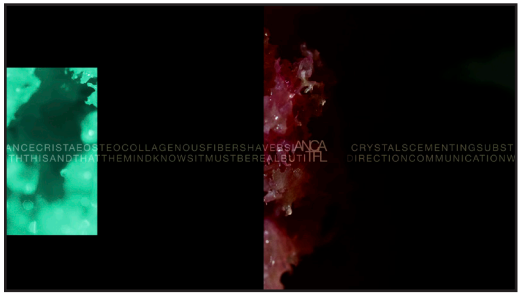


KATHLEEN ROGERS

Screen stills, VASCULAR

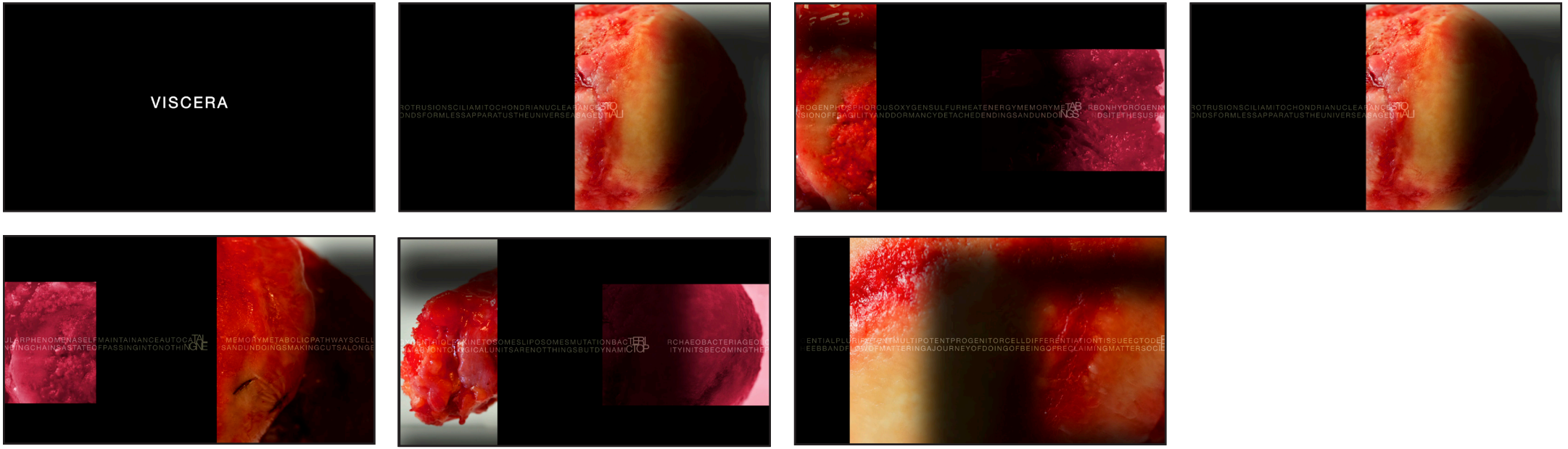






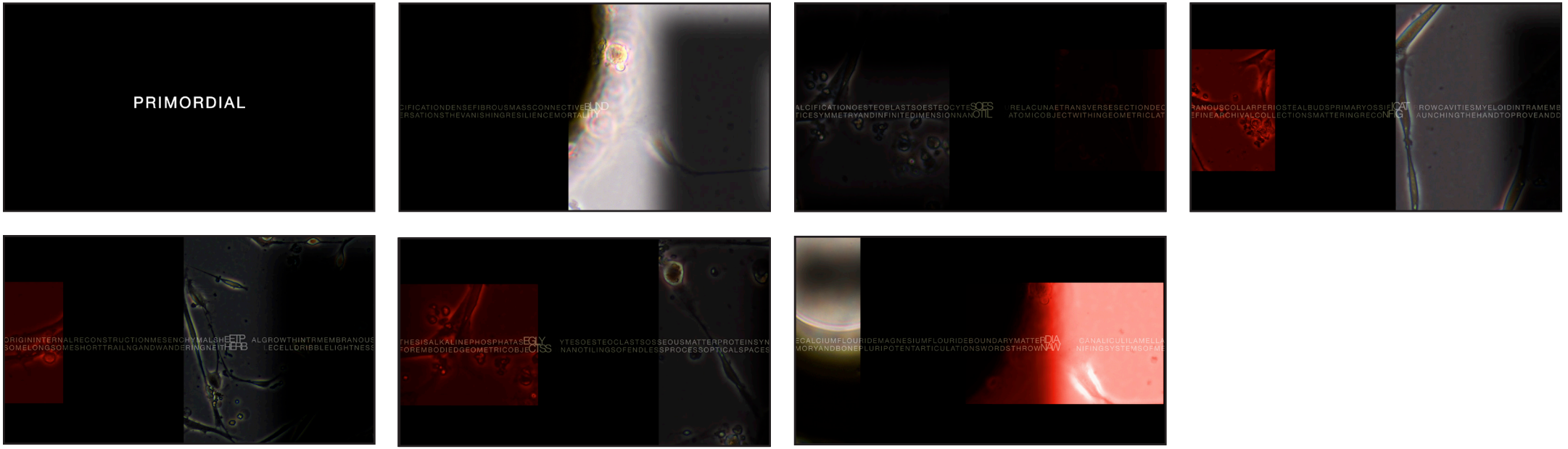
KATHLEEN ROGERS

Screen stills, OSSIFY



KATHLEEN ROGERS

Screen stills, VISCERA

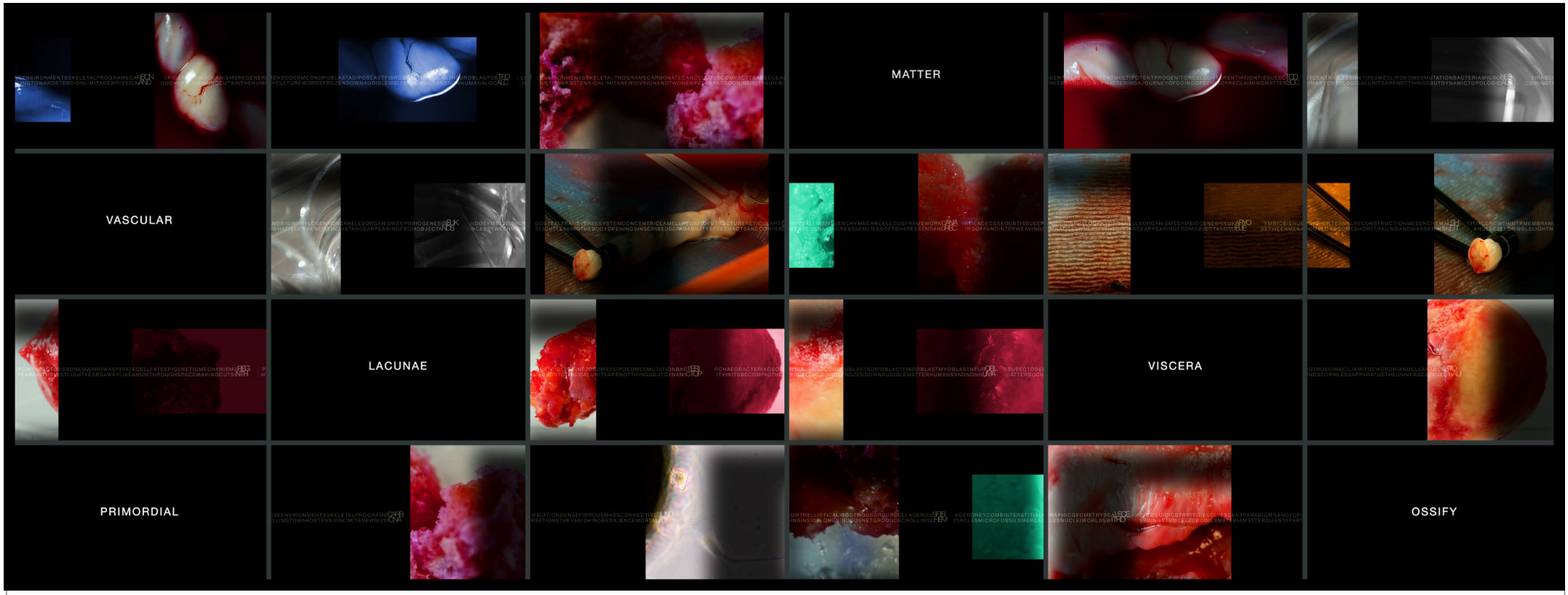


KATHLEEN ROGERS

Screen stills, PRIMORDIAL

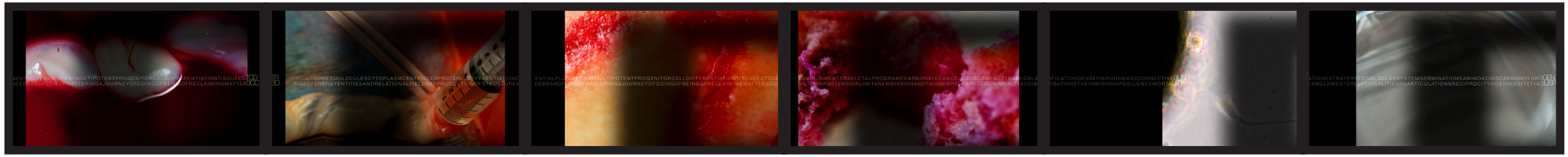
KATHLEEN ROGERS

Screen stills, LACUNAE



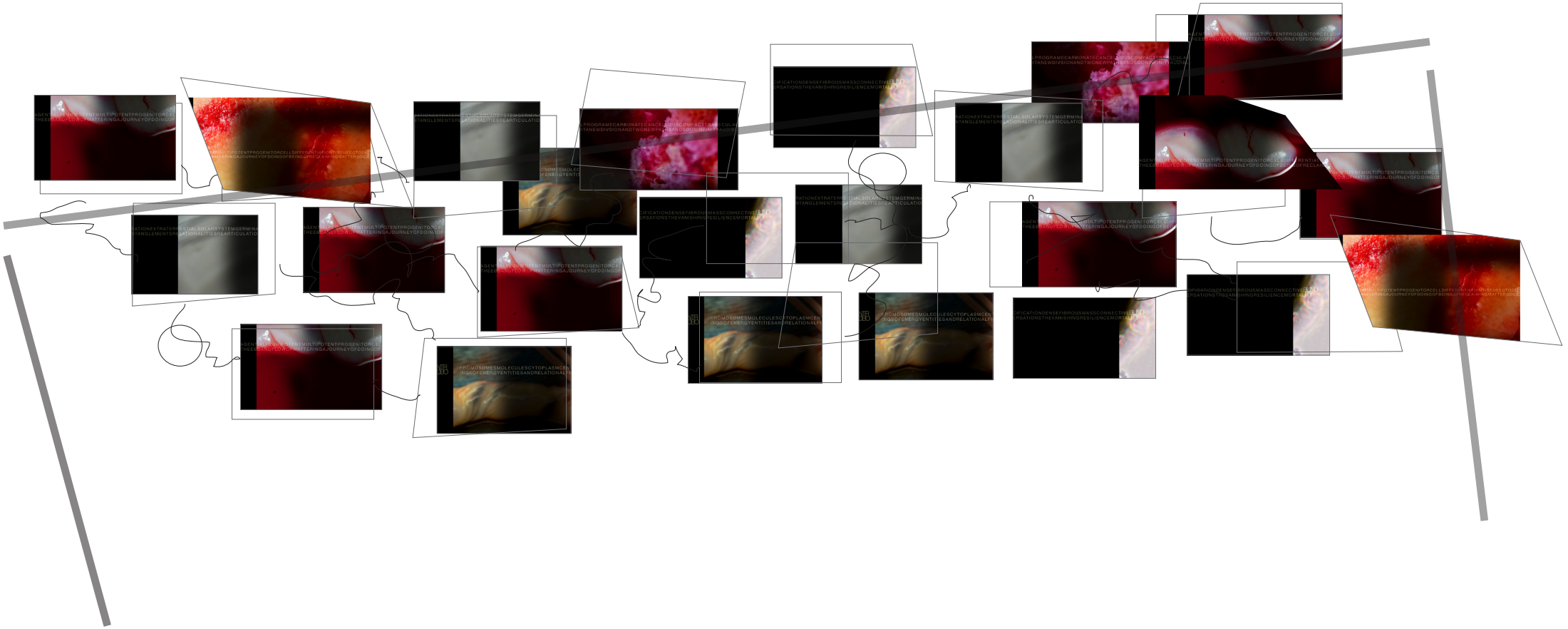
VERSION 1 - 24 PANEL RANDOMISED DISPLAY

24 x (16:9) HD flat panel layout single panel 42’ x 28’ width 22’ height 10’ screen area



VERSION 2 - 6 PANEL LANDSCAPE DISPLAY

6 x (16:9) HD flat panel layout single panel 42’ x 28’ width 22’ height 30” screen area



VERSION 3 24 PANEL TABLE TOP DISPLAY

24 x (16:9) HD flat panel layout for table/plinth single panel 8″ width 5″ height 12 ‘ x 5’ table surface area

DIGITAL PHOTOGRAPHY INSTALLATION

CUTS - FATE MAPS + VOID

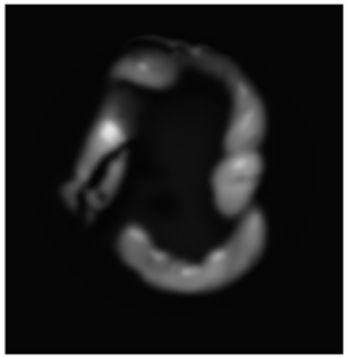
CUTS No's 1 -3 FATE MAPS 00 - 04 + VOID

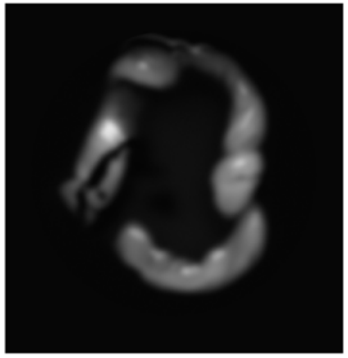
15 x PHOTOGRAPHS(210MMX292MM)B/W/HANNEMUHLE PHOTORAG PEARL(310GSM)

PHOTOGRAPHIC WALL INSTALLATION PRESENTING A SERIES OF 15 IMAGES OF A HUMAN UMBILICAL CORD DONATED FOR STEM CELL AND REGENERATIVE MEDICINE RESEARCH.THE MATURE UMBILICAL CORD IS A RICH SOURCE OF PLURI-POTENT STEM CELLS. THE TITLE OF WORK REFERS TO THE BIOLOGICAL TERM ACCORDED TO THE SURFACE OF FERTILISED EGG OR EARLY EMBRYO PREDICTING WHICH REGIONS WILL FORM VARIOUS TISSUES AND BODY PARTS.

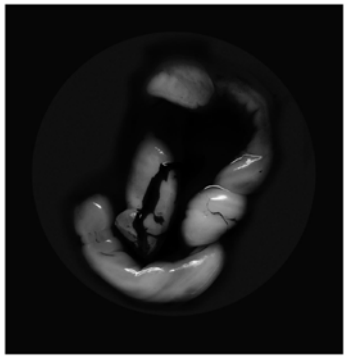
THE EPIGENETIC MECHANISMS THAT GENERATE BONE STRUCTURES AND DENSITY ARE AFFECED BY MATERNAL NUTRITION. SCIENTIFIC INTERVENTIONS INTO THE ENERGETIC PATHWAYS, MECHANISMS AND MOLECULAR CIRCUITRY OF STEM CELLS OFFER NEW GENERATIVE OPPORTUNITIES FOR HEALING/REGENERATING THE BODY AND TOUCH ON ELUSIVE ASPECTS OF MATTER AND LIFE.

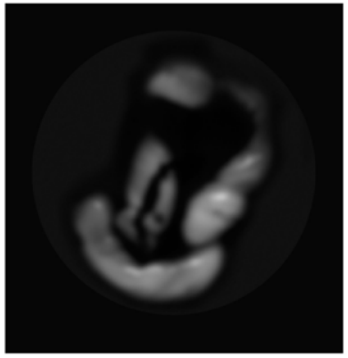
CUT No 1 FATE MAPS 00 - 04 + VOID

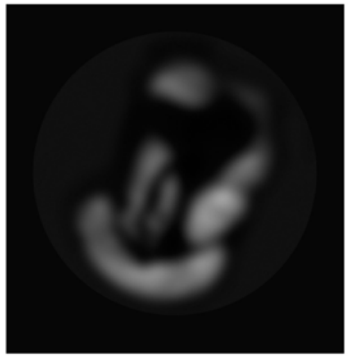




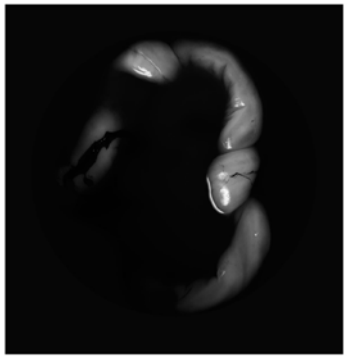
CUTS No 2 FATE MAPS 00 - 04 + VOID

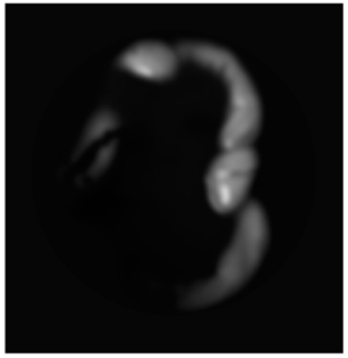






CUT No 3 fate maps 00 - 04 + VOID





Kathleen Rogers

krogers@ucreative.ac.uk