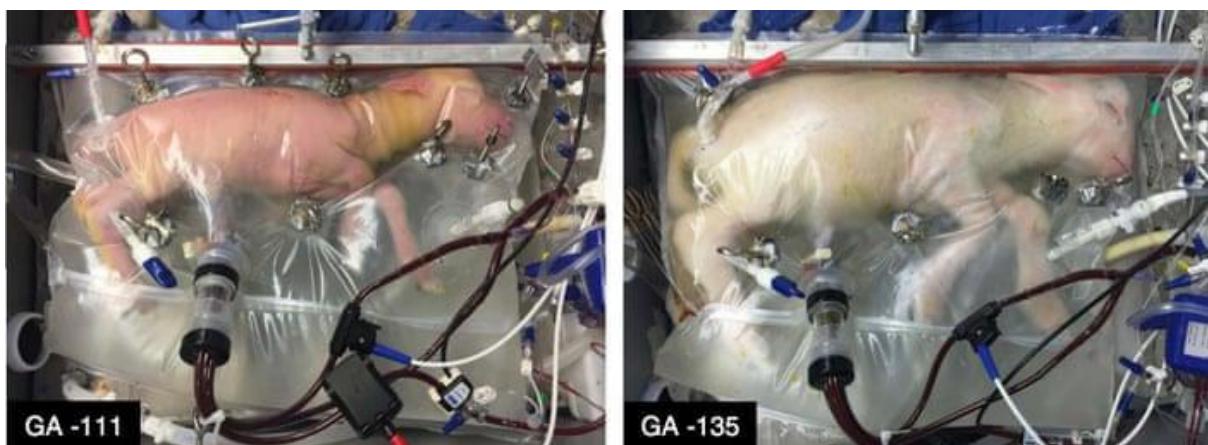


## TOPIC THREE: THE FUTURE OF ASSISTED REPRODUCTION: ARTIFICIAL PLACENTA TECHNOLOGY

- 1.1 Introduction
- 1.2 Lecturer
- 1.3 Lecture Outlines
- 1.4 Seminar

### **1.1 Introduction**

In 2017, scientists in the United States revealed that they had successfully tested their early model artificial placenta on preterm lambs. This technology, designed to emulate the process of gestation that takes place during a human pregnancy, was successfully used to sustain the continued development of lambs removed from a ewe prematurely. The artificial placenta prototype – the ‘biobag’ (also known as ‘EXTEND’ therapy) is designed to ‘take over’ the process of gestation where a person cannot carry a pregnancy to full term. It is highly anticipated to overcome the inherent limitations of neonatal intensive care – there are often complications associated with existing treatments, and there are also viability limits – only babies delivered at 22 weeks or above can survive with the aid of conventional intensive care. It is hoped that the artificial placenta will result in better outcomes – and not be subject to the same limitations of viability.



The team currently working on the artificial placenta in the US anticipate that their design might be ready for testing on human preterm neonates in the near future. There are also teams testing similar designs testing on animals in Japan/Western Australia and Spain. A further team in the Netherlands is currently designing their prototype (a three-minute summary of the technology and how it will work is [available to watch here](#)).

The artificial placenta – while bringing lots of anticipated benefits for extremely premature human entities – also brings with it lots of complex ethical and legal questions. In this course, we focus on those ethico-legal issues related to partial ectogestation (the use of the technology to ‘take over’ gestation) rather than complete ectogestation (using an artificial placenta to grow babies from scratch without there ever needing to be a pregnancy).

## 1.2. Lecturer

### Dr (Elizabeth) Chloe Romanis – Associate Professor in Biolaw

Chloe researches reproduction and the law and has published on artificial womb technology, childbirth and abortion in leading medical law and bioethics journals. She is an expert on assisted gestation, having completed her PhD on the subject of ethico-legal issues arising from ectogestation. Her book, *Biotechnology, Gestation and the Law*, published by Oxford University Press in 2025 was written during her research fellowship at Harvard University in 2022-2023.



- Room: Palatine Centre PCL120
  - Academic Support and Feedback Hours: Wednesdays 9-11 am
- E-mail address: [elizabeth.c.romanis@durham.ac.uk](mailto:elizabeth.c.romanis@durham.ac.uk)

## 2.3 Lecture Outlines

Lectures take place in person at the location on your timetable.

Below is a summary of the lectures and an outline of the reading. The compulsory reading is that which you will need to do alongside each of the lectures. I recommend that you do this each week so that you do not fall behind. Any additional reading is not compulsory – but you may find it helpful in preparing for seminars and/or your assignment.

I've given you lots of additional reading – this is not compulsory reading, but things that you can delve into if you're interested or decide to do your essay/briefing on the topic.

Each lecture has questions for reflection for you to think about after each lecture and consider what *you* think. There are no right or wrong answers! You need to be able to consider the issues, decide what *you* think and be ready to discuss your opinion with others. There is nothing wrong with having a different opinion from others, or with changing your mind! You should have thought about these questions before you attend the seminar.

## LECTURE ONE – THE ARTIFICIAL PLACENTA

17<sup>th</sup> January 2025

This lecture will introduce the artificial placenta (a device capable of emulating the function of the human uterus to enable gestation *ex utero*). This lecture will cover a brief introduction of the science – including recent animal experiments that demonstrate proof of purpose for this technology. We will also consider the ethical and legal status of an entity gestating *ex utero* – does a human entity in the artificial placenta deserve more legal protection than a fetus? And if so, does it deserve the same legal protection as a new-born baby?

### Lecture One Reading (Compulsory)

- Elizabeth Chloe Romanis, 'Artificial womb technology and the frontiers of human reproduction: conceptual differences and potential implications,' (2018) 44 Journal of Medical Ethics 751-755.

- Nick Colgrove, 'Subjects of ectogenesis: are 'gestatelings' fetuses, newborns or neither?' (2019) 45 Journal of Medical Ethics 723-726.
- Elizabeth Chloe Romanis, Artificial womb technology and the significance of birth: why gestatelings are not newborns (or fetuses) (2019) 45 Journal of Medical Ethics 728-731.
- Elizabeth Chloe Romanis, 'Challenging the 'Born Alive' Threshold: Fetal Surgery, Artificial Wombs, and the English Approach to Legal Personhood' (2020) 28 Medical Law Review 93-123.

#### Questions for Reflection

- How would you describe a human entity in an artificial placenta? What legal status do you think it would or should have? Do we have different ethical responsibilities towards it (compared to a fetus/newborn)?
- Why does the legal/ethical status of the entity in the human placenta matter?

#### Additional Reading (Optional)

- Elselijn Kingma and Suki Finn, 'Neonatal incubator or artificial womb? Distinguishing ectogestation and ectogenesis using the metaphysics of pregnancy' (2020) 34 Bioethics 354-363.
- Nick Colgrove, 'Artificial wombs, birth and 'birth': a response to Romanis,' (2020) 46 Journal of Medical Ethics 554-556.
- Elselijn Kingma, 'In defence of gestatelings: response to Colgrove,' (2021) 47 Journal of Medical Ethics 355-356.
- Elizabeth Chloe Romanis and Victoria Adkins, 'Artificial Placentas, pregnancy loss, and loss-sensitive care,' (2024) 50 Journal of Medical Ethics 299-307

## LECTURE TWO – ARTIFICIAL PLACENTAS & ABORTION

24 January 2025

In lecture two, we examine the foundations of abortion law in England and Wales, and consider the impact that artificial placenta technology will have on access to abortion in the England and Wales. Abortion remains a criminal offence, but there are defences to the crime available where doctors provide care in proscribed conditions. In this lecture we consider whether the current legal framework allows people to have abortions in the event that artificial placentas were readily available. We examine arguments made in the bioethical literature that the advent of this technology means that abortion should no longer be considered permissible, and responses by feminist scholars.

#### Lecture Two Reading (Compulsory)

- Abortion Act 1967, s.1.
- Elizabeth Chloe Romanis, Abortion & 'artificial wombs': would 'artificial womb' technology legally empower non-gestating genetic progenitors to participate in

- decisions about how to terminate pregnancy in England and Wales?' (2021) Journal of Law and the Biosciences doi.org/10.1093/jlb/ljab011
- Elizabeth Chloe Romanis, *Biotechnology, Gestation, and the Law*, (Oxford University Press), Chapter 7 – 'Abortion'

#### Questions for Reflection

- To what extent does the advent of artificial placenta technology impact on access to abortion causing fetal death? Does it change a person's ability to access abortion legally? Do you think it should?
- Is there still a *moral* right to abortion if this technology exists? Who has the *moral* right to abortion? And should there be any limitations on it?

#### Additional Reading (Optional)

- Elizabeth Chloe Romanis, 'Is 'viability' viable? Abortion, conceptual confusion and the law in England and Wales and the United States' (2020) doi.org/10.1093/jlb/lcaa059
- Amel Alghrani, *Regulating Assisted Reproductive Technologies: New Horizons*, (Cambridge University Press 2018)
- Emily Jackson, 'Degendering Reproduction,' (2018) 16 Medical Law Review 346-368.
- Christopher Stratman, 'Ectogestation and the Problem of Abortion,' (2020) Philosophy & Technology doi.org/10.1007/s13347-020-00427-2
- Evie Kendal, 'Pregnant people, inseminators and tissues of human origin: how ectogenesis challenges the concept of abortion,' (2020) 38 Monash Bioethics Review 197-204
- Elizabeth Chloe Romanis and Claire Horn, 'Artificial Wombs and the Ectogenesis conversation: a misplaced focus? Technology, abortion, and reproductive freedom,' (2020) 13 International Journal of Feminist Approaches to Bioethics 174-194 [available through Project Muse]
- Eric Mathison and Jeremy Davis, 'Is There a Right to the Death of the Foetus?' (2017) 31 Bioethics 313-320.
- Leslie Cannold, 'Women, Ectogenesis and Ethical Theory,' (1995) 12 Journal of Applied Philosophy 55-64.
- Claire Horn, 'Ectogenesis is for Feminists: Reclaiming Artificial Wombs from Antiabortion Discourse,' (2020) Catalyst doi.org/10.28968/cftt.v6i1.33065
- William Simkulet, 'Abortion and Ectogenesis: Moral Compromise,' (2020) 46 Journal of Medical Ethics 93-98.
- Amel Alghrani, *Regulating Assisted Reproductive Technologies: New Horizons*, (Cambridge University Press 2018)

## LECTURE THREE – ARTIFICIAL PLACENTAS AND THE FUTURE OF PREGNANCY

31 January 2025

In this lecture, we will consider the impact that artificial womb technology will have on the future of pregnancy. We consider arguments that the technology is necessary in order to secure sex equality for female people and arguments that the technology may exacerbate inequality by being inaccessible to certain groups or being used as a tool to coerce pregnant people's behaviour.

### Lecture Three Reading (Compulsory)

- Anna Smajdor, 'The Moral Imperative for Ectogenesis,' (2007) 16 Cambridge Quarterly of Healthcare Ethics 336-345.
- Kathryn MacKay, 'The 'tyranny of reproduction': Could ectogenesis further women's liberation?' (2020) 34 Bioethics 346-353.
- Elizabeth Chloe Romanis, 'Artificial Womb Technology and the Choice to Gestate Ex Utero: Is Partial Ectogenesis the Business of the Criminal Law?' (2020) 28 Medical Law Review 342–374.
- Elizabeth Chloe Romanis, *Biotechnology, Gestation, and the Law*, (Oxford University Press 2025), Chapter 5 - 'Sex & Gender'

### Questions for Reflection

- Would a choice about how to gestate be available to pregnant people in the law as it is currently written – or would ending a pregnancy to opt for an artificial placenta amount to a criminal offence?
- Is it important that people have a choice about how to gestate a human entity to term? What does this mean for sex equality? What do *you* think?
- In what ways might the artificial placenta benefit minority groups? Could it also have negative effects by being used as a tool to control pregnant people's behaviour?

### Additional Reading

- Giulia Cavaliere, 'Ectogenesis and gender-based oppression: Resisting the ideal of assimilation,' (2020) 34 Bioethics 727-734.
- Evie Kendal, *Equal opportunity and the case for state sponsored ectogenesis*, (Palgrave Macmillan 2015)
- Claire Horn and Elizabeth Chloe Romanis, 'Establishing Boundaries for Speculation About Artificial Wombs, Ectogenesis, Gender, and the Gestating Body,' In Chris Dietz, Mitchell Travis and Michael Thomson (eds.), *A Jurisprudence of the Body*, (Palgrave Macmillan 2020).
- Giulia Cavaliere, 'Gestation, equality and freedom: ectogenesis as a political perspective,' (2020) 46 Journal of Medical Ethics 76-82.
- Laura Kimberly, Megan Sutter, Gwendolyn Quinn, 'Equitable access to ectogenesis for sexual and gender minorities,' (2020) 34 Bioethics 338-345.

- Elizabeth Chloe Romanis, Dunja Begović, Margot Brazier and Alexandra Mullock, 'Reviewing the Womb,' (2020) Journal of Medical Ethics doi: 10.1136/medethics-2020-106160
- Elizabeth Chloe Romanis, *Biotechnology, Gestation, and the Law*, (Oxford University Press 2025), Chapter 4 – 'Access'
- Elizabeth Chloe Romanis, 'Equality-enhancing potential of novel forms of assisted gestation: Perspectives of reproductive rights advocates,' (2023) 37 Bioethics 637-646
- JY Lee, Ezio Di Nucci, and Andrea Bidoli, 'Does ectogestation have oppressive potential?' (2023) Journal of Social Philosophy <https://onlinelibrary.wiley.com/doi/10.1111/josp.12512>
- Francesca Mesure, De-gendering Gestation: The Final Impetus for Decriminalising Abortion,' (2023) <https://etheses.dur.ac.uk/15639/>

## LECTURE FOUR – ARTIFICIAL PLACENTAS AND PARENTHOOD

7 February 2025

### Lecture Four Reading (Compulsory)

- Elizabeth Chloe Romanis, *Biotechnology, Gestation, and the Law*, (Oxford University Press 2025), Chapter 6 – Parenthood
- Benjamin Large, 'Moral parenthood: not gestational,' (2024) Journal of Medical Ethics doi: 10.1136/jme-2024-109904 [This paper was published alongside a set of commentaries – I recommend having a read of them to get a sense of the critique. The commentaries are listed at the end of the article, and you can click right onto them]

### Additional Reading (Optional)

- Elizabeth Chloe Romanis and Alan Brown, 'Legal Parenthood, Novel Reproductive Practices, and the Disruption of Reproductive Biosex,' (2024) Modern Law Review <https://onlinelibrary.wiley.com/doi/10.1111/1468-2230.12914>
- Elizabeth Chloe Romanis, "The law is very, very outdated and not keeping up with the technology': Novel forms of assisted gestation, legal challenges, and perspectives of reproductive rights advocates in England and Wales,' (2023) 10 Journal of Law and the Biosciences doi.org/10.1093/jlb/lscd027
- Susan Kennedy, Willing mothers: ectogenesis and the role of gestational motherhood,' (2020) 46 Journal of Medical Ethics 320-327

### Questions for Reflection

- What do *you* think of the rule that a mother is always the person who gestated and gave birth? Is it important, or is it outdated?
- How should we decide who the parents are when an artificial placenta is used? Are you more interested in intention, or genetics? Why?

## 1.4 Seminar

**Week beginning 10<sup>th</sup> February 2025 – check your timetable**

To prepare for the seminar, please consider the questions for reflection that are listed for each lecture and come prepared to discuss them. During the seminar, we will do a mixture of group activities (case-based discussions in groups) and general discussion of all the material in the lectures. There will be plenty of time for any questions you have.

The importance of sensitivity and mutual respect - There are some sensitive topics raised at this point in the course – the accessibility of abortion and maternity care may have impacted on those around you. Please take care to discuss the issue with sensitivity and respect, and if you are struggling with this topic / the work you are assigned or want to discuss this further please contact me.