CURRICULUM VITAE

Personal Information:

Name: Chih-Jen (Lance) Lin PhD MSc **Email:** Chih-Jen.Lin@ed.ac.uk
Personal website: http://www.ed.ac.uk/centre-reproductive-health/dr-chih-jen-lin
Research organisation: Centre for Reproductive Health, Institute for Repair and Regeneration, University of Edinburgh

Education:

2007-2010: PhD; University of Connecticut, USA; Prof. Xiuchun (Cindy) Tian; *"Studies of nuclear reprogramming: DNA replication, therapeutic cloning and improvements of tetraploid complementation."*
2000-2002: MSc; National Taiwan University, Taiwan; Prof. Wiston TK Cheng; *"Generation and analysis of transgenic mice and dairy goat harboring the αLA-hFVIII gene."*
1996-2000: BSc; National Taiwan University, Taiwan; Animal Science.

Employment History:

2022-now: Lecturer, Centre for Reproductive Health, Institute for Regeneration and Repair, University of Edinburgh.
2021-now: Visiting Professor, University of Pavia, Italy.
2015-2022: Principal Investigator, MRC Centre for Reproductive Health, University of Edinburgh.
2014-2015: Postdoctoral fellow, Icahn School of Medicine at Mount Sinai, USA.
2010-2014: Postdoctoral employee, University of California San Francisco, USA.

Brief biography:

I have over 20 years of experience working on embryonic development and assisted reproductive technologies. My major interests include the cellular reprogramming processes. I received my PhD degree at UCONN, USA under the supervision of the pioneers in somatic cell nuclear transfer (SCNT): Professors Jerry Yang and Cindy Tian. I investigated not only to improve the techniques of SCNT and tetraploid complementation, but also used them to gain novel insights into the regulation of histone acetylation and replication timing during the first cell cycles following fertilisation. I mastered and improved methods for the generation of mouse embryonic stem (ES) cells, nuclear transfer ES (ntES) cells, and induced pluripotent stem (iPS) cells, another approach for nuclear reprogramming.

I then joined Prof Miguel Ramalho-Santos's lab and worked closely with Prof Marco Conti at UCSF, USA, as a postdoctoral employee. I investigated the roles of the histone variant H3.3 during oocyte-to-egg transition using micromanipulation techniques such as morpholino knockdown and rescue approaches. In addition, I have shown that Hira-mediated H3.3 incorporation (Hira is an histone H3.3 chaperone) involves the nucleosome assembly in the male genome to form a male pronucleus. Additionally, I overturned the longstanding dogma that transcription of the mouse zygotic genome is minor and not required for development by demonstrating that instead of RNA polymerase II (mRNAs), RNA polymerase I (rRNAs) function is required for zygotic cleavage to 2-cells using mouse conditional knockout mouse approach. I also contributed to Prof Conti's NCB paper on maternal mRNA translation. I then carried out further postdoctoral training in Prof Philippe Soriano's Lab in Icahn School of Medicine at Mount Sinai, USA.

I was recruited to the MRC CRH, University of Edinburgh, as a principal investigator since 2015 and awarded a Royal Society of Edinburgh Personal Research Fellowship in 2016.

My main research direction is to understand epigenetic regulation during oocyte-to-embryo transition and how it impacts on female infertility. Following up on my previous discovery of the role of Hira on the formation of a male pronucleus during fertilisation and embryogenesis (Lin et al Dev 2013 and Dev Cell 2014), we further generated another three mouse models of infertility by depletion the molecules within Hira complex (i.e. Cabin1 and Ubn1), showing that Hira complex is also essential for oocyte acquiring developmental competence (Smith et al., 2022 Development). Moreover, we obtained an HFEA research license allowing recruitment of patients and collecting human zygotes, which led us translating the finding from mouse to human. Our group recently identified that the mechanism is likely conserved (Smith et al., 2021 Reproduction). This finding has been recognised and awarded the ESHRE 2020 Best Basic Science Award.

I also contributed to a major finding of the discovery of the role of LINE1, previously thought as junk DNA, unexpectedly is critical for zygotic genome activation and the regulation of the establishment of totipotency (Percharde and Lin et al., 2018 Cell; Percharde and Lin et al., 2021 STAR Protocols). Our other collaborative activities include pioneering a new technology by which using low-input oocytes/embryos for translatomic analysis (Masek et al., 2020 IJMS) hench found a new non-coding RNA involved in translation during oogenesis (Aleshkina et al., 2021 RNA Biology) and using *in vitro* models to mimic ectopic pregnancy and implantation receptivity respectively (Flanagan et al., 2021 Reproduction and Fraser et al. 2021 HR Open).

Funding History:

2023: -Edinburgh Medical School Biomedical Sciences Summer Vacation Scholarship for lab member. £ 2,500
-SRF Bursary for Fertility2024 £525
-SRF Academic Scholarship £8.546
2022: -The Barbour Watson Trust. £1,200.
2019: -Edinburgh Medical School £10,000.
2018: -MRC Flexible Supplement Fund for the PhD student. £3,500.

- RSE International Exchange Programme (Partner: Ministry of Science and Technology, Taiwan; National Taiwan University, Prof Li-Ying Sung). **PI** (pre-awarded). ~£4,100.
-The Barbour Watson Trust; "*Investigation the mechanism of a common IVF failure phenotype- single pronucleus zygote"*; **PI** and lab member**.** £2,000x2=£4,000.
- University of Edinburgh CMVM College Fund: £20,000.

2017: -RSE International Exchange Programme (Partner: Academy of Sciences of the Czech Republic; Dr Andrej Susor). **PI.** ~£2,000.
-MRC Flexible Supplement Fund for the PhD student. £4,900.
-University of Edinburgh Moray Endowment Fund for the lab member. £2,000.
-The Barbour Watson Trust for the lab member. £2,000.
-SRF Vacation Scholarship for the lab member. £2,750.

2016-2021: Royal Society of Edinburgh Personal Research Fellowship;" *Investigating the underlying mechanism and the development of a novel rescue strategy for abnormally developing zygotes.*"; **PI**; My salary and up to ~£10,000 consumables/year. Total: ~£370,000.

2015: Wellcome Trust-University of Edinburgh Institutional Strategic Support Fund; "*Investigation the roles of histone variant H3.3 and incorporation mechanisms during oocyte-to-embryo transition.*"; **PI**; £20,000.

Prizes and Awards:

2023: Society for Reproduction and Fertility Academic Scholarship recipient (£8,546 for research).
2020: Basic Science Award for oral presentation in ESHRE annual meeting (one of the six winners selected from over 1,800 abstracts; € 2,000)
2014: Joy Cappel (Rockland) 2014 Young Investigator Award ($4,000 credit for polyclonal antibody development).
2014: Betty Jean Ogawa Memorial Awards for the top-scoring poster presentations in ISSCR Annual Meeting (one of the six winners selected from 703 eligible poster abstracts; ~$3,090).
2014: Travel award to the ISSCR Annual Meeting Jun 2014 ($400).
2010: Recipient of Jerry Yang Graduate Research Excellence Award in University of Connecticut, USA.
2007-2010: Graduate assistant scholarship in University of Connecticut, USA (Full coverage of tuition and stipend).
2007-2008: Recipient of Taiwan Merit Scholarship, Taiwan (~£40,000).
2006: Presidential Agriculture Awards, Agricultural Innovation Award, Taiwan (Shared of ~£20,000).
2002: Young Scientist Poster Award of the Chinese Society of Animal Science, Taiwan.
2001: Scholarship of the Alumni of the Department of Animal Husbandry National Taiwan University, Taiwan.

Ad hoc Peer Reviewer:

Journals: PLOS One (2013, 2015), The Journal of Biological Chemistry (2014), Biology of Reproduction (2014), BMC Veterinary Research (2015), Cell cycle (2016, 2016), Nature Communications (2016), PNAS (2018), Theriogenology (2018), EMBO Reports (2018), Development (2018, 2021), IJMS (2018), FASEB J (2019). Human Reproduction (2019, 2020, 2021, 2022, 2023), Reproductive Biology and Endocrinology (2020), Frontiers Cell and Developmental Biology (2020, 2021), Cells (2021), Gene (2021), Journal of Cellular Physiology (2021), Molecular Human Reproduction (2022, 2023), iScience (2022), Nature Cell Biology (2023).
Grants: Medical Research Council (2015, 2018), Human Frontier Science Program (2017), FWF Austrian Science Fund (2019), Czech Science Foundation (2019, 2020, 2021,2023).

Invited talks within 5 years: **2023:** Institute of Animal Physiology and Genetics, Czech Academy of Sciences.
2022: University of Pavia, **2021:** University of Milan, University of Pavia. **2018:** University of Oxford (Nuffield Dept of Woman's and Reproductive Health). **2017:** INIA (Spanish National Institute for Agricultural and Food Research and Technology), Spain; EMBO workshop-Histone Variants, Germany; Institute of Animal Physiology and Genetics, Czech Academy of Sciences.
Teaching activity: UoE Conception to Parturition (Reproductive Biology/ Biomedical science and intercalating Medical students; 2015-present), BMTO Course Assessment Groups, Visiting Professor (University of Pavia, Italy 2021-present).
Administrative activity: Organiser of CRH Seminar series; 2016-present.
Mentoring activity: **Postdoc:** Rupsha Fraser (2016-2019); **PhD student:** Sona Relovska (2016-2020) and Heather Flanagan (2019-now); **Master students** (Cristina Cardenal Peralta, Aleks Tsolova, Janet Tait, Min-Ju Wu, Andreea Gradinaru, and Bethan Rowley)**; PhD dissertation Committee** (Denisa Jansová; Charles University, Czech Republic; Ismael Lamas Toranzo; Univesided Complutense De Madrid, Spain; Lucy Munro; University of Edinburgh).

Selected 5 year Publication

Manuscripts on bioRxiv/ under review:

G Fiorentino, V Merico, M Zanoni, S Comincini, D Sproviero, M Garofal, S Gagliardi, C Cereda, **CJ Lin**, F Innocenti, M Taggi, A Vaiarelli, FM Ubaldi, L Rienzi, D Cimadomo, S Garagna, M Zuccotti. Cumulus cells-secreted extracellular vesicles contain miRNAs as potential regulative factors of mouse oocytes developmental competence (revision in ***Mol Hum Reprod***).

Papers:

1. HC. Flanagan, C W. Duncan, **CJ Lin**, N Spear, AW Horne. Recent advances in the understanding of tubal ectopic pregnancy ***Faculty Review*** 2023 12:(26).
2. Mason JH, Luo L, Reinwald Y, Taffetani M, Hallas-Potts A, Herrington CS, Srsen V, **Lin CJ**, Barroso IA, Zhang Z, Zhang Z, Ghag AK, Yang Y, Waters S, El Haj, A and Bagnaninchi PO. Debiased ambient vibrations optical coherence elastography to profile cell, organoid and tissue mechanical properties. 2023 Nature **Communications Biology** 6: 543.
3. Rowena Smith, Zongliang Jiang, Andrej Susor, Hao Ming, Janet Tait, Marco Conti, and **Chih-Jen Lin**. The H3.3 chaperone Hira complex orchestrates oocyte developmental competence. 2022. **Development** 149 (5): dev200044.
4. Fraser R, R Smith R and **CJ Lin**. A 3D endometrial organotypic model simulating the acute inflammatory decidualisation initiation phase with epithelial induction of the key endometrial receptivity marker, integrin αVβ3. **Hum Reprod Open** 2021 (4): hoab034.
5. Percharde, M., **Lin, CJ** and Ramalho-Santos M. Depletion of Nuclear LINE1 RNA in Mouse ESCs and Embryos. **STAR Protocols** 2021 2(3) 100726.
6. Smith, R, Pickering S, Kopakaki, A, Thong, KJ, Anderson, RA and **Lin CJ.** Histone H3.3 Hira chaperone complex contributes to zygote formation in mice and is implicated in human 1PN zygote phenotype. **Reproduction** 2021; 161(6): 697-707.
7. Aleshkina, D., Lyyappan R., **Lin C.J**., Masek T., Pospisek M, and Susor A. ncRNA BC1 influences translation in the oocyte. **RNA Biol**. 2021 18 :11, 1893-1904.
8. Flanagan, H., **Lin C.J**., Campbell L.L., Horner P., Horne A.W., and Spears N. Ectopic preganancy and epithelial to mesenchymal transition : is there a link ? **Reproduction** 2021; 161(4): V11-V14.
9. Masek, T, E del Llano, L Gahurova, M Kubelka, A Susor, K Roucova, **CJ Lin**, AW Bruce, and M Pospisek. Identifying the translatome of mouse NEBD-stage oocytes via SSP-profiling- A novel polysomme fractionation method. **Int J Mol Sci**. 2020; 21(4):1254.
10. Percharde, M., **Lin, C.J.**, Yin, Y., Guan, J., Peixoto, G.A., Bulut-Karslioglu, A., Biechele, S., Huang, B., Shen, X., and Ramalho-Santos, M. A LINE1-Nucleolin Partnership Regulates Early Development and ESC Identity. **Cell**. 2018;174:391-405 e319.

Technology transfer:

1. Cheng, WTK, SC Wu, and **CJ Lin**. 2005. Transgenic animal system for mammary-gland-specific expression platform (To the TaiMont Biotechnology Ltd., Jan. 2005 ~ Jan. 2010).

Patent:

1. Cheng, WTK, CM Chen, SW Lin, CH Wang, **CJ Lin**, and SC Wu. 2004. Transgenic mammal secreting B-domain deleted human FVIII in its milk (USA Patent No. US 7,667,089 B2).
2. Cheng, WTK, CM Chen, SH Lin, CH Wang, **CJ Lin**, and SC Wu. 2007. Transgenic animals producing biologically active human factor VIII in their milk driven by mammary-specific expression cassette with intact or B domain-deleted recombinant hFVIII gene constructs. ROC Patent, Oct 01, 2007~Feb 05, 2024; Patent number: ROC I-287,578.
3. Lee, KH, HW Hang, HR Chang, CF Tu, and **CJ Lin**. 2004. A Method for generating non-human mammalian chimeric embryo. ROC accepted on Mar 21st, 2010 (092136457) and USA Patents Pended, Pending No.10/875,225.
4. Lee, KH, HW Hang, HR Chang, CF Tu, and **CJ Lin**. 2005. A Method for generating non-human mammalian chimeric embryo. China Patent CN200410000197.
5. Cheng WTK, SC Wu, CC Hsu, YS Lin, and **CJ Lin**. 2011. Novel porcine pancreatic amylase gene promoter and transgenic pigs expressing heterologous digestive enzymes. (USA Patent No. 7,956,238 B2).
6. Cheng WTK, SC Wu, CC Hsu, YS Lin, and **CJ Lin**. 2011. Novel porcine pancreatic amylase gene promoter and transgenic pigs expressing heterologous digestive enzymes. ROC Patent, Oct 21, 2011~May 16, 2026; Patent number: ROC I-350851.