

2024 Emulate New Publications

1. Lymph-Node Chip : DNA origami vaccine

January 2, 2024, Prof. William M. Shih and Donald E. Ingber from Harvard University used the Emulate Lymph-Node Chip to evaluate the efficacy of DNA origami vaccine (DoriVac) nanoparticles, boosting antigen specific immune responses with DNA origami-based vaccines.

Zeng YC, Young OJ, Si L, et al. **DNA origami vaccine (DoriVac) nanoparticles improve both humoral and cellular immune responses to infectious diseases.** bioRxiv; 2024.

DOI: [10.1101/2023.12.29.573647](https://doi.org/10.1101/2023.12.29.573647).

2. Lymph-Node Chip : mRNA vaccine

February 2, 2024, Prof. Lisa A. Chakrabarti from Institut Pasteur post a preprint paper regarding lymph-node chip. In this paper, they developed a Lymphoid Organ-Chip to evaluate mRNA vaccines. Very beautiful pictures presented, should be a high impact paper.

Raphaël Jeger-Madiot, et al. **Recapitulating memory B cell responses in a Lymphoid Organ-Chip to evaluate mRNA vaccine boosting strategies.** BioRxiv, 2024.02.02.578553; doi: <https://doi.org/10.1101/2024.02.02.578553>

3. Liver Chip

March 11, 2024, Emulate CSO Lorna published a review paper for predictive validate study using in vitro liver model. This article describes DILI, the challenges with its prediction and the current strategies and models that are being used. It reviews data from industry-FDA collaborations and strategic partnerships and finishes with an outlook of CIVMs in preclinical toxicity testing.

Jadalannagari, Sushma, and Lorna Ewart. **"Beyond the hype and toward application: liver complex in vitro models in preclinical drug safety."**Expert opinion on drug metabolism & toxicology, 1-13. 13 Mar. 2024.

doi:[10.1080/17425255.2024.2328794](https://doi.org/10.1080/17425255.2024.2328794)

4. Heart Chip

January 22, 2024, Prof Arun Sharma from Cedars-Sinai showed Multi-lineage heart-chip models for drug cardiotoxicity and enhances maturation of human stem cell-derived cardiovascular cells. In this paper, they did TEER analysis, which could be use as an example for potential customer.

Mozneb, Maedeh et al. **"Multi-lineage heart-chip models drug cardiotoxicity and enhances maturation of human stem cell-derived cardiovascular cells."**Lab on a chip vol. 24,4 869-881. 13 Feb. 2024, [doi:10.1039/d3lc00745f](https://doi.org/10.1039/d3lc00745f)

The first heart chip model in the Emulate human emulation system is from Japan, where prof. Ken Takahashi post a preprint paper. In this paper, Ken develop methods for heart beats.

Yun Liu, et al. **Development of a human heart-on-a-chip model using induced pluripotent stem cells, fibroblasts and endothelial cells.** bioRxiv 2023.12.06.569751; doi: <https://doi.org/10.1101/2023.12.06.569751>

4. Xenopus Chip

January 30, 2024, Prof. Don Ingber publisher a Xenopus Chip paper, provides a new way to enhance organ preservation. The authors provide solid evidence that an existing drug, SNC80, can rapidly and reversibly slow biochemical and metabolic activities while preserving cell and tissue viability. This study will be of interest to a broad set of readers interested in organ transplantation, tissue engineering, regenerative medicine organoids, and organ-on-a-chip engineering.

Donald E. Ingber, 2024, **Identification of pharmacological inducers of a reversible hypometabolic state for whole organ preservation**, eLife13:RP93796

<https://doi.org/10.7554/eLife.93796.1>

5. Vagina Chip

January 30, 2024, Ingber lab posted a preprint paper. This study highlights the importance of cervical mucus in controlling human vaginal physiology and pathophysiology, and demonstrates the potential value of Organ Chip technology for studies focused on the health and diseases of the female reproductive tract.

Ola Gutzeit, Aakanksha GULATI, Zohreh IZADIFAR et al. **Modulation of dysbiotic vaginal complications by cervical mucus revealed in linked human vagina and cervix chips**, 31 January 2024, PREPRINT (Version 1) available at Research Square

<https://doi.org/10.21203/rs.3.rs-3898191/v1>

February 16, 2024, Ingber lab published a vagina on a chip JOVE video protocol.

Modeling Healthy and Dysbiotic Vaginal Microenvironments in a Human Vagina-on-a-Chip.

February 16, 2024

[doi: 10.3791/66486](https://doi.org/10.3791/66486)

6. Intestine Chip: PDMS absorb

February 20, 2024, Dr. Yunhai Cui from BI published a paper regarding how to calculate the compounds loss in PDMS OoC.

Carius, P.; Weinelt, F.A.; Cantow, C.; Holstein, M.; Teitelbaum, A.M.; Cui, Y. **Addressing the ADME Challenges of Compound Loss in a PDMS-Based Gut-on-Chip Microphysiological System.** *Pharmaceutics* 2024, 16, 296.

<https://doi.org/10.3390/pharmaceutics16030296>

7. Intestine Chip

January 4, 2024, Prof. Sebo Withoff from UMC Groningen published an iPSC-derived small intestine-on-chip paper and showing OoC can facilitate personalized studies on physiological processes and therapy development.

Moerkens R, Mooiweer J, Ramírez-Sánchez AD, et al. **An iPSC-derived small intestine-on-chip with self-organizing epithelial, mesenchymal and neural cells.** *bioRxiv*; 2024.

[DOI: 10.1101/2024.01.04.574203.](https://doi.org/10.1101/2024.01.04.574203)