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Participant Directory for Tissue Organoids as Models of Host Physiology and Pathophysiology of Disease (2020-J1)

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Conclusion: Our results demonstrated that liver cancer organoids retained characteristic gene expression patterns of the original tumors. Cancer organoids derived from HCC patients showed different growth rates and morphologies depending on culture medium.

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POSTER NUMBER: 1017

Development of an Ex Vivo Drug Testing Platform for Recapitulating Gastric Cancer-specific Microenvironment

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Various studies have been conducted in the development of patient-derived xenograft (PDX) for investigating the efficacy of anti-cancer drugs. However, they still have the critical limitations, such as delay with engraftment time in mice and high maintenance cost. To overcome this limitation, we have established ex vivo gastric cancer PDX culture conditions using porcine stomach tissue-derived decellularized extracellular matrix (St-dECM). We fabricated a large number of samples from one PDX tissue in a day by cutting a single PDX into small pieces and encapsulating them into St-dECM. Our system provide a microenviron-ment for PDX growth in ex vivo. This process can improve production efficiency, reduce the time and cost for sub-culturing PDX and achieve mass production for drug screening. Furthermore, we confirmed different drug resistance depending on the type of PDX upon 5-fluorouracil treatment. These ex vivo PDX culture platform might be used for various cancer drug screening as well as evaluation method to validate rapid patient-specific drug response.

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POSTER NUMBER: 1018

Development of an *ex vivo* microfluidic platform that enabled the preclinical immune response interaction monitoring followed by the immune checkpoint blockade

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Immune checkpoint inhibitors (ICIs) are changing the paradigms of cancer treatment. However, therapy resistance and the immune-related adverse events hindered further applications of ICIs. To address these problems, more studies on the underlying mechanisms are greatly needed. In the aspect of information gathering on the immune- and tumor cell interactions, development of the platform for the live imaging of those interactions can be very useful. Here, we describe a microfluidic-based *ex vivo* platform for monitoring those cell interactions. For the recapitulation of immune- and tumor cell engagement, tumor cell (MC38) engraftment, anti-PD-L1 antibody (PL110) administrations, polydimethylsiloxane (PDMS) based microfluidic device generation were sequentially carried out.

Keystone Symposia 2020

-Tissue Organoids as Models of Host Physiology and Pathophysiology of Disease (J1)-

(Jan 19 – 23, 2020)

Yoo-mi Choi[1], Deukchae Na[2], Jisoo Kim[3], Seoyeon Min[2], Dong-Woo Cho[4], Hee-Gyeong Yi[5], Charles Lee[2,6], Jinah Jang[1,*]

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Abstract

Various studies have been conducted in the development of patient-derived xenograft (PDX) for investigating the efficacy of anti-cancer drugs. However, they still have the critical limitations, such as delay with engraftment time in mice and high maintenance cost. To overcome this limitation, we have established ex vivo gastric cancer PDX culture conditions using porcine stomach tissue-derived decellularized extracellular matrix (St-dECM). We fabricated a large number of samples from one PDX tissue in a day by cutting a single PDX into small pieces and encapsulating them into St-dECM. Our system provide a microenvironment for PDX growth in ex vivo. This process can improve production efficiency, reduce the time and cost for sub-culturing PDX and achieve mass production for drug screening. Furthermore, we confirmed different drug resistance depending on the type of PDX upon 5-fluorouracil treatment. These ex vivo PDX culture platform might be used for various cancer drug screening as well as evaluation method to validate rapid patient-specific drug response.

Conclusion

- The *ex vivo* PDX culture platform fabricated a large number of samples from one PDX tissue in a day by cutting a single PDX into small pieces and encapsulating them into St-dECM.
- This process could improve production efficiency, reduce the time and cost for sub-culturing PDX and achieve mass production for drug screening.
- The *ex vivo* PDX culture platform provided a microenvironment for PDX growth *ex vivo*, and also allowed long term culture and anticancer drug test.
- The *ex vivo* PDX culture platform was easier to control normal cell contamination problems than conventional PDX models, providing an ideal culture system for cancer research.
- This *ex vivo* PDX culture platform might be used for various cancer drug screening as well as evaluation method to validate rapid patient-specific drug response.

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This research was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean Government (MSIP) (NRF-2019R1A3A3005437), Technology development Program (S2633227), and the MSIT(Ministry of Science and ICT), Korea, under the ICT Consilience Creative program(IITP-2019-2011-1-00783) supervised by the IITP(Institute for information & communications Technology Planning & Evaluation).