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Human Chemically Derived Hepatic Progenitor Cells Organoids (hCdHOs) In The Modeling Disease And Drug Analysis Studies

<u>Elsy Soraya SALAS SILVA</u>¹, Yohan KIM⁵, Myounghoi KIM¹, Taehun KIM¹, Daekwan SEO³, Jihyun SHIN², Dongho CHOI*⁴

¹Department Of Surgery, Hanyang University, REPUBLIC OF KOREA ²Research Institute Of Regenerative Medicine And Stem Cells, Hanyang University, REPUBLIC OF KOREA ³Psomagen Inc, University Of Maryland, UNITED STATES OF AMERICA ⁴Department Of HY-KIST Bio-convergence, Hanyang University, REPUBLIC OF KOREA ⁵Molecular Cell Biology And Genetics, Max Planck, GERMANY

Background : The growing need for in vitro models that recapitulate the pathophysiological processes of liver diseases has led us to develop different approaches such as organoids which proved to be a suitable model for disease modeling, drug screening and regenerative medicine

Methods : Human chemically derived hepatic progenitor cells (hCdHs) were generated from hPHs cultured with reprogramming medium (HGF, A83-01 and CHIR99021) for 7 days. We generated organoids using hCdHs and liver cells cultured on Matrigel with organoid medium to obtain hCdHs derived liver organoids (hCdHOs) and human liver organoids (hLOs).

Results : hCdHO and hLOs showed morphological but not genetic similarities, with hCdHOs having a more stemness profile. After treatment with hepatic differentiation medium (DM), hCdHO_DM showed clear hepatic characteristics. hCdHO_DM showed a higher sensitivity to drug treatment even than primary hepatocytes. Finally, under alcohol treatment these organoids showed the typical responses of alcoholic liver disease.

Conclusions : Our hCdHOs present excellent features to position themselves as a novel model for disease modeling and toxicological analysis. This work was supported by Korean Fund for Regenerative Medicine funded by Ministry of Science and ICT, and Ministry of Health and Welfare (21A0401L1) and National Research Foundation of Korea (2022R1F1A1073058).

Corresponding Author : Dongho CHOI (crane87@hanyang.ac.kr)