Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: office@baishideng.com
https://www.wjgnet.com

JOURNAL EDITORIAL BOARD'S REVIEW REPORT

Name of journal: World Journal of Stem Cells

Manuscript NO: 89192

Title: Human pluripotent stem cell-derived kidney organoids: Current progress and challenges

Journal Editor-in-Chief/Associate Editor/Editorial Board Member: Shengwen Calvin Li

Country/Territory: United States

Editorial Director: Jia-Ping Yan

Date accepted review: 2024-01-06 01:55

Date reviewed: 2024-01-06 03:05

Review time: 1 Hour

SCIENTIFIC QUALITY	LANGUAGE QUALITY	CONCLUSION
[ ] Grade A: Excellent	[ ] Grade A: Priority publishing	[ ] Accept
[Y] Grade B: Very good	[Y] Grade B: Minor language polishing	[ ] High priority for publication
[ ] Grade C: Good	[ ] Grade C: A great deal of language polishing	[ ] Rejection
[ ] Grade D: Fair		[Y] Minor revision
[ ] Grade E: Poor	[ ] Grade D: Rejected	[ ] Major revision

JOURNAL EDITORIAL BOARD COMMENTS TO AUTHORS

Comment: The authors have examined Human Pluripotent stem cell-derived kidney Organoids: Current progress and challenges, including an extensive list of 75 references, one table, and three figures. The topics covered range from the process, types of ESCs and iPSCs, isolation, methods, and characterization to their clinical applications. While the EIC appreciated the authors' efforts, the EIC believed the manuscript requires significant revisions for clarity to attract much more readership. The manuscript should be more concise on progress and challenges, with a balanced distribution of content, focusing on its core theme as suggested by the title: Current progress and challenges. This emphasis should be reflected in the Abstract, which lacks the necessary information. For instance, Section 2, which discusses the process, need not be exhaustive; a brief mention spanning a few sentences should suffice. Additionally, instances of redundancy need to be addressed, as detailed in point #2 below. The challenges were not fully discussed in organoid heterogeneity and in vivo

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: office@baishideng.com
https://www.wjgnet.com

functionality, which is not highly reproducible beyond biomarkers (Table 1). The authors should give readers a grip on the issues as a literature review is required (doi: 10.4252/wjsc.v15.i8.781) – as mentioned below in point #4. Specific comments: 1) Not enough referencing: "Figure 1 Overview of human pluripotent stem cell-derived organoids. A: Generation of human pluripotent stem cell (hPSC)-derived cells in two-dimensional (2D) monolayer cell-based differentiation or 3D organoid differentiation; B: The process of generating hPSCs-derived kidney organoids involves the following consecutive stages: Generation of the posterior primitive streak, intermediate mesoderm, nephron progenitor cells, and kidney organoids. hPSC: Human pluripotent stem cell; 3D: Three-dimensional; iPSCs: Induced pluripotent stem cells; ESCs: Embryonic stem cells." EIC comment: These illustrations lack reference to workflow characteristics: How could iPSCs differentiate functionally into ectoderm, mesoderm, and endoderm tissues (not just biomarker profiling)? ESCs could differentiate functionally and structurally into all three types of tissues, which is not well-established for iPSCs. The figure 1 marked fibroblasts to derive iPSCs; however, the authors cited Ref #16, which was in vivo origin. As the authors cited: On page 5: "PSCs have high proliferative capacity and can differentiate into all three germ layers: Ectoderm, endoderm, and mesoderm[12]." Could the authors clarify PSCs cited came from ESCs, not from iPSCs, which differ from ESCs? 12. Thomson JA, Itskovitz-Eldor J, Shapiro SS, Waknitz MA, Swiergiel JJ, Marshall VS, Jones JM. Embryonic stem cell lines derived from human blastocysts. Science 1998; 282: 1145-1147 [PMID: 9804556 DOI: 10.1126/science.282.5391.1145]. 16. Cell Stem Cell . 2014 Jan 2;14(1):53-67. doi: 10.1016/j.stem.2013.11.010. Epub 2013 Dec 12. Redefining the in vivo origin of metanephric nephron progenitors enables generation of complex kidney structures from pluripotent stem cells Atsuhiro Taguchi 1, Yusuke Kaku 1, Tomoko Ohmori 1, Sazia Sharmin 1, Minetaro Ogawa 2, Hiroshi Sasaki 3, Ryuichi Nishinakamura 4 Affiliations expand • PMID: 24332837 • DOI: 10.1016/j.stem.2013.11.010 Free article Abstract Recapitulating three-dimensional (3D) structures of complex organs, such as the kidney, from pluripotent stem cells (PSCs) is a major challenge. Here, we define the developmental origins of the metanephric mesenchyme (MM), which generates most kidney components. Unexpectedly, we find that posteriorly located T(+) MM precursors are developmentally distinct from Osr1(+) ureteric bud progenitors during the postgastrulation stage, and we identify phasic Wnt stimulation and stage-specific growth factor addition as molecular cues that promote their development into the MM. We then use this information to derive MM from PSCs. These progenitors reconstitute the 3D structures of the kidney in vitro, including glomeruli with podocytes and renal tubules with proximal and distal regions and clear lumina. Furthermore, the glomeruli are efficiently vascularized upon transplantation. Thus, by reevaluating the developmental origins of metanephric progenitors, we have provided key insights into kidney specification in vivo and taken important steps toward kidney organogenesis in vitro. #2 – Not appropriate context manifested in the structure: Page 14: "Compared with animal models, organoids offer more opportunities for experimental manipulation, and because they are isolated multicellular systems that are amenable to real-time imaging techniques, they show great potential as a tissue model for applications in developmental

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: office@baishideng.com
https://www.wjgnet.com

biology, pathology, cell biology, homeostasis of the internal environment and regenerative medicine, molecular studies of tumors, disease modelling, precision medicine, as well as in the development of novel drugs and drug efficacy experiments[74,75]." 74 Hiratsuka K, Miyoshi T, Kroll KT, Gupta NR, Valerius MT, Ferrante T, Yamashita M, Lewis JA, Morizane R. Organoid-on-a-chip model of human ARPKD reveals mechanosensing pathomechanisms for drug discovery. Sci Adv 2022; 8: eabq0866 [PMID: 36129975 DOI: 10.1126/sciadv.abq0866] 75 Garreta E, Prado P, Stanifer ML, Monteil V, Marco A, Ullate-Agote A, Moya-Rull D, Vilas-Zornoza A, Tarantino C, Romero JP, Jonsson G, Oria R, Leopoldi A, Hagelkruys A, Gallo M, González F, Domingo-Pedrol P, Gavaldà A, Del Pozo CH, Hasan Ali O, Ventura-Aguiar P, Campistol JM, Prosper F, Mirazimi A, Boulant S, Penninger JM, Montserrat N. A diabetic milieu increases ACE2 expression and cellular susceptibility to SARS-CoV-2 infections in human kidney organoids and patient cells. Cell Metab 2022; 34: 857-873.e9 [PMID: 35561674 DOI: 10.1016/j.cmet.2022.04.009] The statement and citations did not belong to the section Conclusion, which should be the authors' synopsis, not generic citations like the above. These citations belong to the section of the introduction. #3: page 6: "Several procedures for differentiating pluripotent cells from kidney cells have recently been developed (Table 1)." The sentence is illogical. #4: page 10, “Additionally, the use of CRISPR/Cas9 to edit hPSCs, introduce specific mutations, and compare them with samples from homogeneous genetic backgrounds is another approach for studying inherited kidney diseases[48,49].” What was the author's elaboration on this approach?