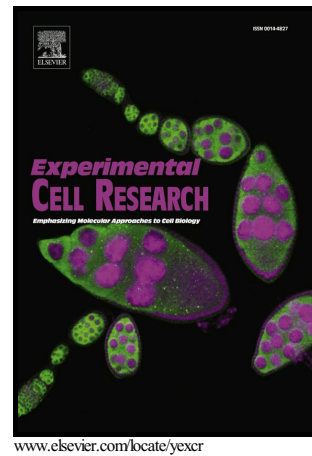


Author's Accepted Manuscript

Liver 'organ on a chip'

Colin H Beckwitt, Amanda M Clark, Sarah Wheeler, D. Lansing Taylor, Donna B. Stolz, Linda Griffith, Alan Wells



PII: S0014-4827(17)30678-X
DOI: <https://doi.org/10.1016/j.yexcr.2017.12.023>
Reference: YEXCR10862

To appear in: *Experimental Cell Research*

Received date: 19 November 2017
Revised date: 21 December 2017
Accepted date: 27 December 2017

Cite this article as: Colin H Beckwitt, Amanda M Clark, Sarah Wheeler, D. Lansing Taylor, Donna B. Stolz, Linda Griffith and Alan Wells, Liver 'organ on a chip', *Experimental Cell Research*, <https://doi.org/10.1016/j.yexcr.2017.12.023>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Liver 'organ on a chip'

**Colin H Beckwitt^{1,4,6}, Amanda M Clark¹, Sarah Wheeler¹, D. Lansing Taylor^{2,4,5},
Donna B. Stolz^{3,4}, Linda Griffith⁷, Alan Wells^{1,2,4,6}**

Departments of Pathology¹, Computational and Systems Biology², and Cell Biology³, and the McGowan Institute of Regenerative Medicine⁴ and Drug Discovery Institute⁵, University of Pittsburgh, Pittsburgh, PA 15213 USA

Research and Development Service⁶, VA Pittsburgh Health System, Pittsburgh, PA 15240 USA
Department of Biological Engineering⁷, Massachusetts Institute of Technology, Cambridge, MA, 02139

Introduction/Abstract

The liver plays critical roles in both homeostasis and pathology. It is the major site of drug metabolism in the body and, as such, a common target for drug-induced toxicity and is susceptible to a wide range of diseases. In contrast to other solid organs, the liver possesses the unique ability to regenerate. The physiological importance and plasticity of this organ make it a crucial system of study to better understand human physiology, disease, and response to exogenous compounds.

The purpose of this review is to inform the reader of the significance and available methods for replicating human liver physiology and pathology *ex vivo*. First, the physiologic roles of the liver and its cellular constituents will be discussed. Second, we will discuss the need for developing an *ex vivo* liver system. Third, the advantages and disadvantages of different cell sources used to populate the system will be mentioned. Fourth, the benefits of currently employed *ex vivo* liver culture systems (both commercially available and used in research laboratories) will be discussed. Finally, future directions to advance these systems, including

Download English Version:

<https://daneshyari.com/en/article/8451417>

Download Persian Version:

<https://daneshyari.com/article/8451417>

[Daneshyari.com](https://daneshyari.com)