

Deborah K. Lieu, Ph.D.

Research/Academic Interests Dr. Lieu's research focuses on the mechanisms underlying the differentiation and maturation of human induced pluripotent stem cell (hiPSCs) into pacemaking cardiomyocytes for engineering biopacemakers and contractile cardiomyocytes for cell replacement therapy after heart attack.

Title Assistant Professor

Specialty [Cardiovascular Medicine](#)

Department [Internal Medicine](#)

Division Cardiovascular Medicine

Address/Phone UC Davis Institute for Regenerative Cures (IRC), 2921 Stockton Blvd. Sacramento, CA 95817
Phone: 916-703-9300

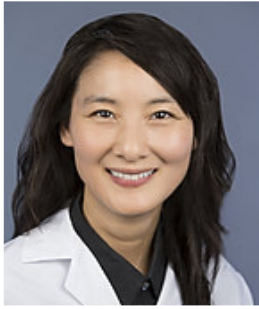
Education Ph.D., Biomedical Engineering, UC Davis, Davis CA 2002
B.S., Neurobiology, Physiology, and Behavior, UC Davis, Davis CA 1996

Honors and Awards UC Davis Academic Senate New Research Initiative Award, 2020
CIRM grant DISC2-10120, 2017
UC Davis Academic Federation Innovative Developmental Award, 2015
CIRM grant RB4-05764, 2013
Shriners Hospital for Children Postdoctoral Fellowship, 2007
CIRM grant DISC2-12263, 2021

Select Recent Publications Smithers RL, Kao HKJ, Zeigler S, Yechikov S, Nolte JA, Chan JW, Chiamvimonvat N, Lieu DK. Making Heads or Tails of the Large Mammalian Sinoatrial Node Micro-Organization. *Circ Arrhythm Electrophysiol.* 2021 Dec;14(12):e010465. doi:10.1161/CIRCEP.121.010465. Epub 2021 Nov 19. PMID:34794338.

Yechikov S, Kao HKJ, Chang CW, Pretto D, Zhang XD, Sun YH, Smithers R, Sirish P, Nolte JA, Chan JW, Chiamvimonvat N, Lieu DK. NODAL inhibition promotes differentiation of pacemaker-like cardiomyocytes from human induced pluripotent stem cells. *Stem Cell Res.* 2020 Dec;49:102043. doi:10.1016/j.scr.2020.102043. Epub 2020 Oct 12. PMID:33128951.

Chang CW, Kao HKJ, Yechikov S, Lieu DK, Chan JW. An intrinsic, label-free signal for identifying stem cell-derived cardiomyocyte subtype. *Stem Cells.* 2020 Mar;38(3):390-394. doi:10.1002/stem.



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Sun YH, Kao HKJ, Chang CW, Merleev A, Overton JL, Pretto D, Yechikov S, Maverakis E, Chiamvimonvat N, Chan JW, Lieu DK. Human induced pluripotent stem cell line with genetically encoded fluorescent voltage indicator generated via CRISPR for action potential assessment post-cardiogenesis. *Stem Cells*. 2020 Jan;38(1):90-101. doi:10.1002/stem.3085. Epub 2019 Sep 30. PMID:31566285.

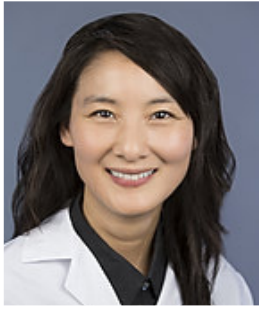
Gluck JM, Herren AW, Yechikov S, Kao HKJ, Khan A, Phinney BS, Chiamvimonvat N, Chan JW, Lieu DK. Biochemical and biomechanical properties of the pacemaking sinoatrial node extracellular matrix are distinct from contractile left ventricular matrix. *PLoS One*. 2017 Sep 21;12(9):e0185125. doi:10.1371/journal.pone.0185125. PMID:28934329.

Yechikov S, Copaciu R, Gluck JM, Deng W, Chiamvimonvat N, Chan JW, Lieu DK. Same-Single-Cell Analysis of Pacemaker-Specific Markers in Human Induced Pluripotent Stem Cell-Derived Cardiomyocyte Subtypes Classified by Electrophysiology. *Stem Cells*. 2016 Nov;34(11):2670-2680. doi:10.1002/stem.2466. Epub 2016 Jul 29. PMID:27434649.

Lieu DK, Fu JD, Chiamvimonvat N, Tung KC, McNerney GP, Huser T, Keller G, Kong CW, Li RA. Mechanism-based facilitated maturation of human pluripotent stem cell-derived cardiomyocytes. *Circ Arrhythm Electrophysiol*. 2013 Feb;6(1):191-201. doi:10.1161/CIRCEP.111.973420. Epub 2013 Feb 7. PMID:23392582.

Awasthi S, Matthews DL, Li RA, Chiamvimonvat N, Lieu DK, Chan JW. Label-free identification and characterization of human pluripotent stem cell-derived cardiomyocytes using second harmonic generation (SHG) microscopy. *J Biophotonics*. 2012 Jan;5(1):57-66. doi:10.1002/jbio.201100077. Epub 2011 Nov 15. PMID:22083829.

Lieu DK, Liu J, Siu CW, McNerney GP, Tse HF, Abu-Khalil A, Huser T, Li RA. Absence of



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Lieu DK, Chan YC, Lau CP, Tse HF, Siu CW, Li RA. Overexpression of HCN-encoded pacemaker current silences bioartificial pacemakers. *Heart Rhythm.* 2008 Sep;5(9):1310-7. doi:10.1016/j.hrthm.2008.05.010. Epub 2008 May 15. PMID:18693074.

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