

# Curtis L. Petersen MS, MPH, PhD

Co-founder & Chief Product Officer - Ucardia

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## PROFESSIONAL

*Ucardia*, Austin TX

### Chief Product Officer

2019-Current

- System architecture
- Leading front end and back-end development
- Writing data analytic and aggregation pipelines
- Creating user interfaces for data visualizations
- Identifying hardware partners
- Converting clinical needs into remote medical sensing solutions using technology
- Communicating with both internal and external partners

*ImagineCare Digital Health*, Dartmouth-Hitchcock, Lebanon NH

### Data Scientist

2014-2016

- Writing analytic algorithms of passively and actively collected data
- Developing system architecture & logic design of semi-automated response system
- Analyzing, interpreting, & summarizing data to feed into design and business cases
- Conducting systematic reviews and writing clinical care algorithms based on evidence

*Druker/Deininger & Dao Lab*, Oregon Health & Science University, Portland, OR

### Research Assistant II

2009-2013

- Investigated the role of a CXCR4 antagonist in eliminating residual leukemia, *Blood* 2012
- Studied cytokine effect on JAK2V617F mutations in myeloproliferative neoplasms, *Blood* 2011
- Investigated the interaction between fanconi anemia, hematopoietic regulators, and betacatenin, *Blood* 2012

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## EDUCATION

*Dartmouth College*, Hanover, NH

### Burroughs Wellcome Big Data in the Life Sciences Fellow

**Doctor of Philosophy** *The Dartmouth Institute for Health Policy & Clinical Practice*

2016-2021

Dissertation: Precision Medicine: The Potential For Connecting Mobile Health Phenotypes To Molecular Profiles

**Masters of Science** *Quantitative Biomedical Science Program*

2020

Thesis: DNA Methylation As A Clinical Marker

**Masters in Public Health** *The Dartmouth Institute for Health Policy & Clinical Practice*

2014

Internship: Creating an Accountable Care Organization assessment tool

Capstone Project: Risk of multifocal breast cancer in women with atypical hyperplasia

*University of Oregon*, Eugene, OR

**Bachelors of Science** *Biology & Biochemistry*

2009

## TEACHING & MENTORING

### Teaching Assistant: Dartmouth, MPH/MS Students

- PH 139: Epidemiology & Biostatistics I + Lab Summer 2016 & 2017
- PH 140: Epidemiology & Biostatistics II + Lab Fall 2016 & 2017
- PH 141: Regression & Other Statistical Approaches + Lab Winter 2017
- PH 147: Advanced Methods in Health Services Research + Lab Spring 2017

### Instructor: Dartmouth, MPH/MS/MD/Postdoc/Residents

- Introduction to R: Workshop Winter 2017
- Graduate Research Peer Mentor Fall 2017-Spring 2019

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## SKILLS

### Technical

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Research	Programing
Machine Learning: classification, regression, clustering, feature engineering;	R: Shiny, tidyverse, caret;
Inferential Methods: Experimental & Observational Study Design;	Python: Pandas, Jupyter;
Artificial Neural Networks;	Karas/Tensorflow;
Repeated Measures: Hierarchical Modeling;	Stata;
Health Informatics: Natural Language Processing;	SQL/NoSQL;
Genomic/Epigenomic Associations: Cell Type Estimation;	Ract-Native;
Molecular Cloning & Cell Culture	Bioconductor & Biopython

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### Non-Technical

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Critical Thinking	Communication
Data Wrangling;	Manuscripts & Analytic Reports;
Teaching Statistical Language Classes (R & Stata);	Building Interactive Data Dashboards;
Teaching Epidemiological Concepts;	Logic & Conceptual Models;
Judged Public Presentations;	Writing Evidence As Guidelines;
Protocol Synthesis;	Verbal & Poster Presentations;
Analytic Plans	Conflict Resolution & Negotiation

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## AWARDS & ACHIEVEMENTS

- Fellowship: Burroughs Wellcome Fund - Big Data in the Life Sciences Training Program 2018-2021
  - Dartmouth Graduate Student Council President 2019-2020
  - Dartmouth Graduate Student Executive Council Academic Chair 2018-2019
  - Winner of 5th Annual Epidemiology Poster Award, The Obesity Society 2017
  - Student Employee of the Year, University of Oregon 2009
  - Recipient, Benjamin A. Gilman Scholarship (Competitive International Study Program) 2009
  - Eagle Scout, Boy Scouts of America 2004
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## PUBLICATIONS

### Peer Reviewed Manuscripts

ORCID: <https://orcid.org/0000-0002-7210-447X>

[Google Scholar Link](#)

Agarwal A\*, Fleischman AG\*, **Petersen CL\***, Loriaux MM, Woltjer R, Druker BJ, Deininger MW, Effects of Plerixafor (AMD3100) In Combination with Tyrosine Kinase Inhibition In a Murine Model of CML. *Am Soc Hematology*. 2010. 3389-3389. \*co-first authors

Fleischman AG, Aichberger KJ, **Petersen CL**, Doratotaj S, Bumm TG, Pahl HL, Druker BJ, Deininger MW, Jak2 V617F Induced TNF Resistance as a Mechanism of Clonal Expansion In Myeloproliferative Neoplasm. *Am Soc Hematology*. 2010.

Fleischman AG, Aichberger KJ, Luty SB, Bumm TG, **Petersen CL**, Doratotaj S, Vasudevan KB, LaTocha DH, Yang F, Press RD, Loriaux MM, TNF $\alpha$  facilitates clonal expansion of JAK2V617F positive cells in myeloproliferative neoplasms. *Blood*. 2011., 118(24), pp.6392-6398.

Dao KHT, Rotelli MD, **Petersen CL**, Kaech S, Nelson WD, Yates JE, Newell AEH, Olson SB, Druker BJ, Bagby GC, FANCL ubiquitinates  $\beta$ -catenin and enhances its nuclear function. 2012. *Blood*, 120(2), pp.323-334.

Agarwal A, Fleischman AG, **Petersen CL**, MacKenzie R, Luty S, Loriaux M, Druker BJ, Woltjer RL, Deininger MW, Effects of plerixafor in combination with BCR-ABL kinase inhibition in a murine model of CML 2012. *Blood*, 120(13), pp.2658-2668.

Nutter EL, Weiss JE, Marotti JD, Barth RJ Jr, Eliassen MS, Goodrich ME, **Petersen CL**, Onega T, Personal history of proliferative breast disease with atypia and risk of multifocal breast cancer. 2017 Dec 20. *Cancer*. PMID: [29266172](#)

**Petersen CL**, Wechsler EV, Halter RJ, Boateng GG, Proctor PO, Kotz DF, Batsis JA, Detection, Monitoring, and Feasibility of Repetitions Using an mHealth-Enabled Resistance Band, ACM ISBN 978-1-4503-5958-0/18/09. Applications, Systems and Engineering Technologies, September 26–28, 2018 <https://doi.org/10.1145/3278576.3278586>

Saunders CH, **Petersen CL**, Durand MA, Bagley PJ, Elwyn G, Bring on the machines: could machine learning improve the quality of patient-education materials? A systematic search and rapid review., *JCO Clinical Cancer Informatics*. 2018.

Weeks WB, Mishra MK, Curto D, **Petersen CL**, Cano P, Hswen Y, Serra SV, Elwyn G, Godfrey MM, Soro PS, Tomás JF. Comparing Three Methods for Reducing Psychotropic Use in Older Demented Spanish Care Home Residents. *J Am Geriatr Soc*. 2019 Jul;67(7):1444-1453. doi: 10.1111/jgs.15855. Epub 2019 Mar 8. PMID: 30848834.

Batsis JA, Boateng GG, Seo LM, **Petersen CL**, Fortuna KL, Wechsler EV, Peterson RJ, Cook SB, Pidgeon D, Dokko RS, Halter RJ, Kotz DF. Development and Usability Assessment of a Connected Resistance Exercise Band Application for Strength-Monitoring. *World Acad Sci Eng Technol*. 2019;13(5):340-348. doi: 10.5281/zenodo. PMID: 31205628; PMCID: PMC6570823.

**Petersen CL**, Weeks WB, Norin O, Weinstein JN, Development and Implementation of a Person-Centered, Technology-Enhanced Care Model For Managing Chronic Conditions: Cohort Study, *JMIR Mhealth Uhealth* 2019;7(3):e11082, URL: <https://mhealth.jmir.org/2019/3/e11082>, DOI: 10.2196/11082, PMID: 30892274

Brooks JM, **Petersen CL**, Titus AJ, Umucu E, Chiu CY, Bartels SJ, Batsis JA, Varying Levels of Food Insecurity Associated with Clinically Relevant Depressive Symptoms in U.S. Adults Aged 60 Years and Over: Results from the 2005–2014 National Health and Nutrition Survey, *Journal of Nutrition in Gerontology and Geriatrics*, 38:3, 218-230, DOI: 10.1080/21551197.2019.1611520

Schott SL, Xu K, Berkowitz J, **Petersen CL**, Saunders C, Sobti N, Coylewright M; Timing of electric health record Integrated Decision Aid (IDeA) for stroke prevention in atrial fibrillation matters; *Journal of the American*

College of Cardiology Mar 2019, 73 (9 Supplement 1) 3005; DOI: 10.1016/S0735-1097(19)33611-3

Batsis JA, **Petersen CL**, Crow RS, Cook SB, Stevens CJ, Mackenzie TA, Titus A, Bartels SJ, Weight Change and Risk of Frailty: Data from the National Health and Nutrition Examination Surveys 1999-2004. Obesity. 2019. Clinical Nutrition. ISSN 0261-5614, <https://doi.org/10.1016/j.clnu.2019.10.032>. (<http://www.sciencedirect.com/science/article/pii/S0261561419331255>)

Levy JJ, Titus AJ, **Petersen CL**, Chen Y, Salas LA, Christensen BC, MethylNet: A Modular Deep Learning Approach to Methylation Prediction, bioRxiv 692665; doi: <https://doi.org/10.1101/692665>

Crow RS, **Petersen CL**, Cook SB, Titus AJ, MacKenzie TA, Batsis JA, Reported Weight Change in Older Adults and Presence of Frailty. The Journal of Frailty and Aging (JFA). <http://dx.doi.org/10.14283/jfa.2019.44>

**Petersen CL**, Brooks JM, Titus AJ, Vasquez E, Batsis JA, Relationship Between Food Insecurity and Functional Limitations in Older Adults from 2005-2014 NHANES. Journal of Nutrition in Gerontology and Geriatrics. 2019. DOI: 10.1080/21551197.2019.1617219

Brooks JM, **Petersen CL**, Kelly SM, Reid MC, Likelihood of depressive symptoms in US older adults by prescribed opioid potency: National Health and Nutrition Examination Survey 2005-2013. Int J Geriatr Psychiatry. 2019; 1- 9. <https://doi.org/10.1002/gps.5157>

Batsis JA, **Petersen CL**, Crow RS, Cook SB, Stevens CJ, Mackenzie TA, Weight change and risk of the foundation of National Institute of Health Sarcopenia-defined low lean mass: Data from the National Health and Nutrition examination surveys 1999-2004 [published online ahead of print, 2019 Nov 4]. Clin Nutr. 2019;S0261-5614(19)33125-5. doi:10.1016/j.clnu.2019.10.032

**Petersen CL**, Mishra MK, Curto D, Cano P, Hswen Y, Serra SV, Elwyn G, Soro PS, Tomás JF, Weeks WB, Reducing psychotropic medication use in non-demented older care home residents. Journal of General Internal Medicine. (2020) doi:10.1007/s11606-019-05517-2

Levy JJ, Titus AJ, **Petersen CL**, Chen Y, Salas LA, Christensen BC. MethylNet: an automated and modular deep learning approach for DNA methylation analysis. BMC Bioinformatics. 2020 Mar 17;21(1):108. doi: 10.1186/s12859-020-3443-8. PMID: 32183722; PMCID: PMC7076991.

Batsis JA, **Petersen CL**, Cook SB, Al-Nimr RI, Pidgeon D, Mackenzie TA, Bartels SJ. A Community-Based Feasibility Study of Weight-Loss in Rural, Older Adults with Obesity. J Nutr Gerontol Geriatr. 2020 Jul-Dec;39(3-4):192-204. doi: 10.1080/21551197.2020.1817226. Epub 2020 Sep 9. PMID: 32907522; PMCID: PMC7787696.

Batsis JA, **Petersen CL**, Crow RS, Cook SB, Stevens CJ, Seo LM, Brooks E, Mackenzie TA. Weight change and risk of the foundation of National Institute of Health Sarcopenia-defined low lean mass: Data from the National Health and Nutrition examination surveys 1999-2004. Clin Nutr. 2020 Aug;39(8):2463-2470. doi: 10.1016/j.clnu.2019.10.032. Epub 2019 Nov 4. PMID: 31727381; PMCID: PMC7196520.

**Petersen CL**, Halter R, Kotz D, Loeb L, Cook S, Pidgeon D, Christensen BC, Batsis JA. Using Natural Language Processing and Sentiment Analysis to Augment Traditional User-Centered Design: Development and Usability Study. JMIR Mhealth Uhealth. 2020 Aug 7;8(8):e16862. doi: 10.2196/16862. PMID: 32540843; PMCID: PMC7442942.

**Petersen CL**, Chen JQ, Salas LA, Christensen BC. Altered immune phenotype and DNA methylation in panic disorder. Clin Epigenetics. 2020 Nov 18;12(1):177. doi: 10.1186/s13148-020-00972-9. PMID: 33208194; PMCID: PMC7672933.

Al-Nimr RI, Wright KCS, Aquila CL, **Petersen CL**, Gooding TL, Batsis JA. Intensive nutrition counseling as part of a multi-component weight loss intervention improves diet quality and anthropometrics in older adults with obesity. Clin Nutr ESPEN. 2020 Dec;40:293-299. doi: 10.1016/j.clnesp.2020.09.002. Epub 2020 Sep 19. PMID: 33183553; PMCID: PMC7670080.

**Petersen CL**, Minor CM, Mohieldin S, Park LG, Halter RJ, Batsis JA. Remote Rehabilitation: A Field-Based Feasibility Study of an mHealth Resistance Exercise Band. IEEE Int Conf Connect Health Appl Syst Eng Technol. 2020 Dec;2020:5-6. Epub 2021 Jan 21. PMID: 34184001; PMCID: PMC8234905.

Batsis JA, **Petersen CL**, Clark MM, Cook SB, Lopez-Jimenez F, Al-Nimr RI, Pidgeon D, Kotz D, Mackenzie TA, Bartels SJ. A Weight Loss Intervention Augmented by a Wearable Device in Rural Older Adults With Obesity: A Feasibility Study. *J Gerontol A Biol Sci Med Sci*. 2021 Jan 1;76(1):95-100. doi: 10.1093/gerona/glaa115. PMID: 32384144; PMCID: PMC7756700.

Batsis JA, **Petersen CL**, Clark MM, Cook SB, Kotz D, Gooding TL, Roderka MN, Al-Nimr RI, Pidgeon D, Haedrich A, Wright KC, Aquila C, Mackenzie TA. Feasibility and acceptability of a technology-based, rural weight management intervention in older adults with obesity. *BMC Geriatr*. 2021 Jan 12;21(1):44. doi: 10.1186/s12877-020-01978-x. PMID: 33435877; PMCID: PMC7801868.

Whedon JM, Haldeman S, **Petersen CL**, Schoellkopf W, MacKenzie TA, Lurie JD. Temporal Trends and Geographic Variations in the Supply of Clinicians Who Provide Spinal Manipulation to Medicare Beneficiaries: A Serial Cross-Sectional Study. *J Manipulative Physiol Ther*. 2021 Mar;44(3):177-185. doi: 10.1016/j.jmpt.2021.02.002. Epub 2021 Apr 10. PMID: 33849727.

**Petersen CL**, Christensen BC, Batsis JA. Weight management intervention identifies association of decreased DNA methylation age with improved functional age measures in older adults with obesity. *Clin Epigenetics*. 2021 Mar 2;13(1):46. doi: 10.1186/s13148-021-01031-7. PMID: 33653394; PMCID: PMC7927264.

Seo LM, **Petersen CL**, Halter RJ, Kotz DF, Fortuna KL, Batsis JA. Usability Assessment of a Bluetooth-Enabled Resistance Exercise Band Among Young Adults. *Health Technol (Berl)*. 2021 Apr;5(1):4. doi: 10.21037/ht-20-22. Epub 2021 Apr 30. PMID: 34336543; PMCID: PMC8320739.

Schott SL, Berkowitz J, Dodge SE, **Petersen CL**, Saunders CH, Sobti NK, Xu K, Coylewright M. Personalized, Electronic Health Record-Integrated Decision Aid for Stroke Prevention in Atrial Fibrillation: A Small Cluster Randomized Trial and Qualitative Analysis of Efficacy and Acceptability. *Circ Cardiovasc Qual Outcomes*. 2021 Jun;14(6):e007329. doi: 10.1161/CIRCOUTCOMES.120.007329. Epub 2021 Jun 10. PMID: 34107740.

Mohieldin S, Batsis JA, Minor CM, Halter RJ, Petersen CL. BandPass: A Bluetooth-Enabled Remote Monitoring Device for Sarcopenia. *IEEE Int Conf Commun Workshops*. 2021 Jun;2021:10.1109/iccworkshops50388.2021.9473520. doi: 10.1109/iccworkshops50388.2021.9473520. Epub 2021 Jul 9. PMID: 34745771; PMCID: PMC8570642.

Levy JJ, Chen Y, Azizgolshani N, **Petersen CL**, Titus AJ, Moen EL, Vaickus LJ, Salas LA, Christensen BC. MethylSPWNet and MethylCapsNet: Biologically Motivated Organization of DNAm Neural Networks, Inspired by Capsule Networks. *NPJ Syst Biol Appl*. 2021 Aug 20;7(1):33. doi: 10.1038/s41540-021-00193-7. PMID: 34417465; PMCID: PMC8379254.

Azizgolshani N, **Petersen CL**, Chen Y, Levy JJ, Salas LA, Perreard L, Nguyen LN, Christensen BC. DNA 5-hydroxymethylcytosine in pediatric central nervous system tumors may impact tumor classification and is a positive prognostic marker. *Clin Epigenetics*. 2021 Sep 19;13(1):176. doi: 10.1186/s13148-021-01156-9. PMID: 34538273; PMCID: PMC8451154.

Batsis JA, **Petersen CL**, Cook SB, Al-Nimr RI, Driesse T, Pidgeon D, Fielding R. Impact of whey protein supplementation in a weight-loss intervention in rural dwelling adults: A feasibility study. *Clin Nutr ESPEN*. 2021 Oct;45:426-432. doi: 10.1016/j.clnesp.2021.07.006. Epub 2021 Jul 24. PMID: 34620350; PMCID: PMC8502229.

### Manuscripts Under Review & In Revision

**Petersen CL**, Li X, Halter RJ, Kotz DF, Batsis JA, Positive perceptions of mHealth based physical activity and weight reduction program. *Health Informatics*. 2020

Lynch DH, **Petersen CL**, Fanous MM, Spangler H, Kahkoska AR, Jimenez D, Batsis JA, The Relationship Between Multimorbidity, Obesity, and Functional Impairment in Older Adults.

### Manuscripts In Preparation

Nelson HH, Miller JS, Christensen BC, **Petersen CL**, Koestler DC, Kelsey KT, Cytomegalovirus (CMV) is associated with leukocyte PDCD1 methylation and patient outcome in head and neck cancer.

**Petersen CL**, Jacobson N, Decrease blood pressure during remote medical sensing of hypertensive adults: large open trial.

Lynch DH, **Petersen CL**, Van Dongen MJ, Spangler H, Berkowitz SA, Batsis JA, Association of Food Insecurity and Sarcopenia: Data From the 2011-2014 National Health and Nutrition Examination Survey.

**Petersen CL**, Jacobson N, Christensen BC, Batsis JA, Use of Remotely Monitoring In Older Adults To Detect Association Between High Levels Of Physical Activity with Decreased Weight and Increased Functional Ability.