Kara E. McCloskey, Ph.D.

School of Engineering

University of California, Merced

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Merced, CA 95343

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**EDUCATION The Cleveland Clinic Foundation** Cleveland, Ohio

Biomedical Engineering Department

Graduate Student (Ph.D. awarded from OSU), April 1999 – March 2001

**The Ohio State University** Columbus, Ohio

Ph.D. Chemical Engineering, 2001

M.S. Chemical Engineering, 1999

B.S. Chemical Engineering, 1996

**University of Akron** Akron, Ohio

Dance Major: August 1990 - December 1991

**ACADEMIC POSITIONS**

2013- pres. Associate & Founding Professor School of Engineering, UC, Merced

2013-pres. Chair Graduate Program in Biological Engineering and Small-scale

Technologies (BEST) - UC, Merced

2005-2013 Assistant & Founding Professor School of Engineering, UC, Merced

2006-2010 Chair & Founder Graduate Program in Biological Engineering and Small-scale

Technologies (BEST) - UC, Merced

2001-2005 Postdoctoral Fellow Institute Bioengineering & Bioscience, Georgia Institute of Technology

1999-2001 Graduate Student Biomedical Engineering, The Cleveland Clinic Foundation

1996-1999 Graduate Student Chemical Engineering, The Ohio State University

RESEARCH TRAINING/EXPERIENCE

**June-Aug 2012 Visiting Faculty**

**Stanford University, Mechanical Engineering: NSF- funded EFRI-MIKS: Force Sensing and Remodeling in Multicellular Tissues**

July 2001 - July 2005 Postdoctoral Training

**Georgia Institute of Technology** Institute for Bioengineering and Bioscience, Atlanta

Developed methods for inducing the differentiation of embryonic stem cells down an endothelial lineage using biochemical treatments, cell sorting techniques and mechanical forces. This work was funded from a NRSA fellowship from NIH. This position also included teaching activities: Systems Physiology II.

April 1999 – July 2001Doctoral Research

**The Cleveland Clinic Foundation** Biomedical Engineering, Cleveland, Ohio

Doctoral Thesis: Characterization of the antibody binding mechanisms used to impart paramagnetic labels on specific cellular antigen molecules for magnetic cell separation.

June 1996 - April 1999 Graduate Research

**Ohio State University** Chemical Engineering, Columbus, Ohio

Master’s Thesis: Developed mathematical models and methodology for using cell-tracking technology to quantitate cellular surface antigen expression levels on immunomagnetically labeled cells.

## TEACHING EXPERIENCE

Fall18 Special Topics in Materials, UC, Merced

Sp 18 Engineering Living Systems– UC, Merced

Fall07,08, 17, Sp11,13,15 Tissue Engineering – UC, Merced

Sp08, Sp09, Sp14 Physiology for Engineers – UC, Merced

Fall11, Fall12, Fall13, Sp16 Biotransport – UC, Merced

Sp06, Sp07 Fluid Mechanics – UC, Merced

Sp09 - pres. Cardiovascular Stem Cell Engineering Journal Club – UC, Merced

Fall06 Intro to Bioengineering – UC, Merced

Fall10, Sp11 Professional Seminar for Engineers – UC, Merced

Sp09, Fall09, Sp12 Bioengineering Capstone Design – UC, Merced

2007-2010 Stem Cell Journal Club– UC, Merced

2006-2009 Graduate Research Seminar – UC, Merced

Fall06, Sp07 Service Learning (community project-based course) – UC, Merced

Fall04 Organ Systems Physiology– Georgia Tech

June96 - Sept98 TA – Various Courses (Chemical Engineering Unit Operations Laboratory, Thermodynamics, Graduate Fluid Transport, Graduate Seminar) - OSU

Sp98 Completed Course at OSU – “How to Teach in Engineering” (AgE801)

**SERVICE**

2017-2020 BMES Awards Committee

Grant Reviewer

2007- 2011, 2014-pres Maryland Stem Cell Program

2018 Lawrence Livermore National Labs

2016 UC Cancer Research Coordinating Committee (CRCC)

2008 - 2011 NIH – National Research Service Awards (NRSA)

2011 R01 Study Section BST-M (50)

2009 - 2016 NSF – Career Awards, Graduate Research Fellowship Program

2014 – pres Journal Editorial Board: Stem Cell Research & Therapy, AIMS Cell and Tissue Engineering, Journal of Materials & Applied Science

Journal Reviewer

2003-pres ATVB, Stem Cell Research, Experimental Cell Research, Tissue Engineering, Biotechnology and Bioengineering, Biotechnology Progress, Regenerative Medicine, Biomaterials Molecular Pharmaceutics, Artificial Organs, Pharmaceutical Research, Public Library of Science-Pathogens, Applied Biochemistry and Biotechnology, American Chemical Society, Stem Cells, Stem Cell Reports

2009 Conference Chair

10th Annual UC-wide Bioengineering Symposium hosted at UC Merced

Conference Session Chair

September TERMIS Annual Meeting – San Diego, CA

Dec12, 2016 TERMIS Annual Meeting – San Diego, CA

Oct 8, 2014 BMES Annual Meeting – Cardiovascular Tissue Engineering, Tampa, FL

Feb 5, 2014 ASME NanoEngineering in Medicine and Biology: Nanoengineering for Regenerative Medicine and Tissue Engineering, San Francisco, CA

Sept 27, 2013 BMES Annual Meeting – Tissue Engineered Models for Study of Disease and Drug Discovery, Seattle, WA

Oct 24-27, 2012 BMES Annual Meeting – Cell Delivery and Cell-Based Therapeutics, Atlanta, GA

May 1, 2012 Society of Biological Engineering- Stem Cell Engineerin​g - Vascularization, Seattle , WA

Oct 15, 2011 BMES Annual Meeting – Cardiac Functional Analysis, Tissue Engineering II, Hartford, CT

June 14, 2011 Annual UC Systemwide Bioengineering Symposium, Santa Barbara, CA – Stem Cell Engineering

Dec, 2010 TERMIS Annual Meeting – Microbiotechnology for Regenerative Medicine

June, 2009 Annual UC Systemwide Bioengineering Symposium hosted at UC Merced

Jan, 2008 SBE- Stem Cell Engineering in Coronado Island, CA

Oct, 2008 BMES Annual Meeting – Biomechanical Signaling in Stem Cells Engineering, Pittsburgh, PA

June, 2008 UC Systemwide Bioengineering in Riverside, CA

University of California, Merced

Aug 2015-pres Chair, Graduate Group Program in “Biological Engineering and Small-scale Technologies” – UC, Merced

Aug 2013 – 2015 Chair, Graduate Group Program in “Biological Engineering and Small-scale Technologies” – UC, Merced

Aug 2013 – Aug 2015 Member, Committee on Committees

Jan 2012 – 2013 Chair, Educational Policy Committee in “Biological Engineering and Small-scale Technologies” – UC, Merced

Jan 2007 – Aug 2010 Chair and Founder, Graduate Group Program in “Biological Engineering and Small-scale Technologies” – UC, Merced

2007 – 2011, 2012-2015 IACUC Member– UC, Merced

2007 -2008, 20011-2012 Curriculum Committee for the School of Engineering – UC, Merced

2005- 2007 Undergraduate Council – UC, Merced

2006- 2007 Engineering Executive Committee – UC, Merced

Sept 2005 – pres Faculty Search Committees – Bioengineering, Systems Biology

2007-pres Campus Liaison for UC System-wide Bioengineering

Outreach

Fall, 2011 WISE talk: "How I got here"

Oct 7, 2008 Dinner with a Scientist, Oakdale Schools

2008 Judge for Stanislaus County Science Fair, K-6th grade

IBB (Institute for Bioengineering and Bioscience)

April 2002 – July 2005 Present research at events sponsored by the institute: Suddath Symposium, and NSF site, Educational Partners site, and Industrial Partners site visits

January 2002 – July 2005 Served as a mentor for undergraduate students: This involved proposing a research project for undergraduate student to independently complete in one years time and serving as the primary advisor on the project.

###### CCF (Cleveland Clinic Foundation) Departmental Service

July 2000 – May 2001 Graduate Students Activities Committee ’00-’01

Present research at foundation events: Lerner Research Institute (LRI) Paper Competition, LRI Retreat, Graduate Student Research Day

OSU (The Ohio State University) University Service

1997 – 1998 Council of Graduate Students – Served on Committee on Academic Misconduct

1998 Served on advisory Committee for TA Workshop

Sept. 1998 & Sept. 1999 Taught a workshop aimed to provide general training to new TAs

Nov. 2000 Presented at Graduate Research Initiative Program at Ohio State University

OSU Departmental Service

1997 & 1998 Graduate Chemical Engineering Student Orientation

1997 & 1998 Advisor/Mentor for Freshmen Women in Engineering Workshop, ’97 and ’98

1997 – 1999 Created and source-authored an advice column in departmental newsletter that answered technical, political, and social inquiries. ’97-’99

## PROFESSIONAL MEMBERSHIPS

BMES (Biomedical Engineering Society) ’02-present

ISSCR (International Society for Stem Cell Research) **’**03-present

TERMIS (Tissue Engineering & Regenerative Medicine International Society) ’03-2018

NAVBO (North American Vascular Biology Organization) ’08-‘10

ASEE (American Society for Engineering Education) ’98-’99 and ’06-‘09

AIChE (American Institute of Chemical Engineers) ’93-**’**01

ACS (American Chemical Society) **’**01

SPE (Society for Plastics Engineers) ’93-**’**94

**HONORS AND AWARDS NSF-funded EFRI-MIKS Research Program: Force Sensing and Remodeling in Multicellular Tissues, Stanford University**, 2012

CIRM New Faculty Award, 2009

Invitation to CIRM-sponsored workshop in stem cells in UK, 2007

National Research Service Award from NIH-NHLBI 2003-2005

Distinguished Scientific Poster Award – Georgia Life Sciences Summit 2002

Lerner Research Institute Award – Paper Competition 2001

Lerner Research Institute Award – Paper Competition 2000

Academic Scholarship from the University of Akron 1990-91

Dance Scholarship from the University of Akron 1990-91

**GRANTS**

NSF I CORPS 1/1/2018-12/31/2018 Award #: 1547848 $50,000

Title: Modularized Bioprinter for High Throughput Pharmaceutical Development

Role: PI

NSF-CREST 4/15/2016-3/31/2021

Award # 1547848

Center for Cellular and Biomolecular Machines $5,000,000

PI: Victor Munoz

Role: Co-PI

NSF Science and Technology Center (STC) 8/2010-8/2020

Award # 0939511 $25,000,000

Science and Technology Center: Emergent Behavior of Integrated Cellular Systems (EBICS)

PI and Lead Institution: Roger Kamm, MIT

Role: Collaborator, Thrust Lead and Working Group Lead

NIH Program Project Grant 2/1/2013-1/31/2018

Award # P01 AG000538 $11,000,000

Title: Behavioral and neural plasticity in the aged

Program Project Director - Carl Cotman, UC Irvine

Project #5: Oligomeric Aß and inflammation in neurovascular pathogenesis in AD (Cribbs)

Role: Collaborator

California Institute of Regenerative Medicine, Basic Biology 6/2014-5/2016

Directed Differentiation of Specialized Endothelial Cells

Award # RB5-07414 $476,000

Role: PI

NSF Integrative Graduate Education and Research Traineeship (IGERT)

Award # 0965918, Lead: Rashid Bashir, UIUC 8/2010-8/2015

Role: Collaborator, Subaward $150,000 over 5 yr $3,000,000

NIH postdoctoral fellowship (F32-National Research Service Award)

F32 HL104924-01A1 Turner (PI) 9/15/10 to 9/15/11

Novel Biomimetic Tissue Architecture as a Cell Delivery Vehicle for Cardiac Regeneration $95,000

Role: Mentor

California Institute of Regenerative Medicine Conference Grant June, 2009

Conference Grant: 2009 UC System-wide Bioengineering Symposium

Role: PI, Symposium Chair $8,000

UC, Merced Graduate and Research Council, 2013-2014 Research Award

Notch reprograms citric acid cycle metabolism to drive vascular $10,000

Differentiation

Role: Co-PI with Fabian Filipp

Role: PI California Institute of Regenerative Medicine, New Faculty Award II

RN2-00921-1 McCloskey (PI) 1/2009-12/2013

Building Cardiac Tissue from Stem Cells and Natural Matrices

Role: PI $1,706,255

California Institute for Regenerative Medicine SEED Grant

RS1-00239-1 Khine (PI) 6/01/07-5/31/10

Micro-platform for controlled embryonic stem cell differentiation

Role: Co-PI $363,707

NIH predoctoral fellowship (F31-National Research Service Award)

F31HL087716-0 Blancas (PI) 3/26/07-3/26/10

Angiogenic potential of endothelial progenitor cells is a function of maturation Role: Mentor $124,000

UC, Merced Graduate and Research Council, 2007-2008 Research Award

Development of a 3-D Scaffolding for the Optimization of Embyronic Coral Cell Growth and Differentiation

Role: PI $5,000

UC, Merced Graduate and Research Council, 2007-2008 Research Award

Towards the Development of a Cardiac Patch

Role: PI $5,000

UC, Merced Graduate and Research Council, 2005-2006 Research Award

Endothelial Differentiation of Human Embyronic Stem Cells $ 2,500

NIH postdoctoral fellowship (F32-National Research Service Award)

F32 HL071461-01A1 McCloskey (PI) 5/15/03 – 8/11/05

Vascular cells derived from embryonic stem cells

Role: PI, Mentor: Robert M. Nerem $144,432

### INVITED LECTURES

October 12, 2018 Organ-on-a-chip, SelectBiosciences, San Diego, CA

August 28, 2018 UC, Merced – Center for Cellular and Biomolecular Machines (CCBM)

July 12, 2018 Tissue Engineering and Regenerative Medicine Conference – Paris, France

Jan 30, 2016 Southern California Systems Biology Conference - Irvine, CA

Jan 30, 2015 Modesto Junior College – Modesto Area Partners in Science (MAPS)

June 19, 2015 UC Bioengineering Systemwide, Irvine, CA

Dec 3-7, 2012 IEEE-EMBS Micro- and Nanoengineering in Medicine, Maui, HI

Aug 28-Sept1, 2012 IEEE in Medicine and Biology Society (EMBS), San Diego, CA

Feb 5, 2012 Texas A&M University – Biomedical Engineering

April 27, 2011 Stanford University – Biomechanical Engineering

March 8, 2011 IGERT-CMMB Seminar Series, UIUC

Dec 11, 2009 10th Annual Wound Healing: Science and Industry, St. Thomas, Virgin Islands

Feb 11, 2009 UC, Riverside – Biomedical Engineering

Jan 23, 2009 Modesto Junior College – Modesto Area Partners in Science (MAPS)

Oct 22, 2008 University of Florida – Biomedical Engineering

# March 17, 2008 UC, Berkeley - Bioengineering

June 27, 2003 ASME Summer Bioengineering Conference in Key Biscayne, FL

**PEER-REVIEWED JOURNAL PUBLICATIONS**

1. Madfis NC, Lin Z, Kumar A, Douglas SA, Platt MO, Kara E. McCloskey Co-Emergence of Specialized Endothelial Cells from Embryonic Stem Cells. **Stem Cells and Development** Jan 9, 2018. PMID: 29320922
2. Singh SJ, Turner W, Glaser DE, McCloskey KE**,** Filipp FV. Metabolic shift in density-dependent stem cell differentiation. **Cell Communication and Signaling,** 2017 Oct 20;15(1):44. PMID: 29052507.
3. Shen E McCloskey KE. Development of Mural Cells: From In Vivo Understanding to In Vitro Recapitulation. **Stem Cells and Development** 2017 May 2. doi:10.1089/scd.2017.0020. Epub ahead of print, print version on July 11, 2017. PMID: 28462621.
4. Wong L, Pegan J, Basia Gabela-Zuniga Khine M, McCloskey KE. Leaf-inspired microcontact printing vascular patterns. **Biofabrication**, 2017 May 10. doi: 10.1088/1758-5090/aa721d. PMID: 28488588
5. Glaser DE, Turner WS, MadfisN, WongL, Zamora J, Reyes S, Burns AB, GopinathanA, McCloskey KE. Multifactorial Optimizations for Directing Endothelial Fate from Embryonic Stem Cells**. PLOS One** December 1, 2016, PMID: 27907001
6. Sa S, Wong L, McCloskey KE. Combinatorial Fibronectin and Laminin Signaling Promotes Highly Efficient Cardiac Differentiation of Human Embryonic Stem Cells. **Bioresearch Open Access,** 2014 Aug 1;3(4):150-61. PMID: 25126479 (15 citations)
7. Glaser DE, Burns AB, Hatano R, Medrzycki M, Fan YH, McCloskey KE. Specialized mouse embryonic stem cells for studying vascular development. **Stem Cells and Cloning: Advances and Applications** October 2014, Volume 2014:7 79-88. PMID: 25328412
8. Turner WS, Sandhu N, McCloskey KE. Tissue Engineering: Construction of a Multicellular 3D Scaffold for the Delivery of Layered Cell Sheets. **Journal of Visualized Experiments.** 201492, e51044, doi:10.3791/51044.
9. Hatano R, Mercurio K, Luna JI, Glaser D, Leppert V, McCloskey KE. Endothelial Cells Derived from Embryonic Stem Cells Respond to Cues from Topographical Surface Patterns **Journal of Biological Engineering** 2013, **7(1):**18. PMID: 23819656
10. Blancas AA, Wong L, Glaser DE, McCloskey KE. Specialized Tip/Stalk- and Phalanx-like Endothelial Cells from Embryonic Stem Cells. **Stem Cells and Development** May 2013, 22(9): 1398-1407. PMID: 23249281. *Received the* *CoverHighlight* (15 citations)
11. Sa S, McCloskey KE. Optimization of Activin A and BMP4 Signaling for Efficient Cardiac Differentiation of H7 and H9 Human Embryonic Stem Cells. **Journal of Stem Cells and Regenerative Medicine** J Stem cells Regen Med 2012;8(3): 198 – 202. PMID. 24693198
12. Sa S, McCloskey KE. Stage-Specific Cardiomyocyte Differentiation Method for H7 and H9 Human Embryonic Stem Cells. **Stem Cell Reviews and Reports**, 2012, 8(4): 1120-1128. PMID: 22890895
13. Turner W, Wang X, Johnson S, Medberry C, Mendez J, Badylak SF, McCord MG, and McCloskey KE. Cardiac Tissue Development for Delivery of Embryonic Stem Cell-Derived Endothelial and Cardiac Cells in Natural Matrices. **Journal of Biomedical Materials Research** 2012, Nov;100(8):2060-72.
14. Turner W, McCloskey KE. Rapid Fibroblast Removal from High Density Human Embryonic Stem Cell Cultures. **Journal of Visualized Experiments,** 2012 e3951, doi: 10.3791/3951.
15. Sa S, Nguyen D, Pegan, JD, Khine M, McCloskey KE. Round-Bottomed Honeycomb Microwells: Embryoid Body Shape Correlates with Stem Cell Fate, **Journal of Developmental Biology and Tissue Engineering**, 2012, May; 4(2):12-22.
16. Blancas AA, Chen C, Stolberg S, McCloskey KE. Adhesive Forces in Embryonic Stem Cells. **Cell Adhesion and Migration**, 2011 Nov 1;5(6):472-9.
17. Blancas AA, Shih AA, Lauer NE, McCloskey KE. Induction of Endothelial Cells from Murine Embryonic Stem Cells in Chemically-Defined Medium. **Stem Cells and Development**, 2011; 20(12): 2153-2161. PMID: 21446878. (30 citations)
18. Glaser D, Gower RM, Lauer NE, Tam K, Blancas AA, Simon SI, McCloskey KE. Functional Regulation of Stem Cell-Derived Endothelial Cells. **Journal of Vascular Research**, 2011; 48: 415-428. (33 citations)
19. Luna PJ, Ciriza J, Garcia-Ojeda M, Lieu DK, Li RA, Fowlkes CC, Khine M, McCloskey KE. Multi-scale Biomimetic Topography for the Alignment of Neonatal and Embryonic Stem Cell-derived Heart Cells. **Tissue Engineering Part C: Methods**, 2011;17(5):579-88. *Received* *the CoverHighlight* (3 citations).
20. Nguyen D, Sa S, Pegan JD, Rich B, Xianga G, McCloskey KE, Manilay J, Khine M. Tunable shrink-induced honeycomb microwell arrays for uniform embryoid bodies. **Lab on a Chip**, 2009; 9:3338-3344. *Received the* *Inside CoverHighlight* (16 citations).
21. *Invited:* Stolberg S, McCloskey KE. Can Shear Stress Direct Stem Cell Fate? **Biotechnology Progress,** 2009; 25(1): 10-19. *Top 10 most-accessed manuscripts in Biotechnology Progress during February 2009* (33 citations).
22. Chen C, Pegan J, Luna J, Xia B, McCloskey K, Chin W, Khine M. Shrinky-Dink Hanging Drops: A Simple Way to Form and Culture Embryoid Bodies.  **Journal of Visualized Experiments**, 2008; <http://www.jove.com/index/Details.stp?ID=692>
23. McCloskey KE, Smith D, Jo H, Nerem RM. Embryonic stem cell-derived endothelial cells may lack complete functional maturation in vitro. **Journal of Vascular Research**, 2006; 43(5):411-421.
24. McCloskey KE, Gilroy ME, Nerem RM. Use of Embryonic Stem Cell-Derived Endothelial Cells as a Cell Source to Generate Vessel Structures In Vitro. **Tissue Engineering**, 2005; 11:497-505 (43 citations).
25. McCloskey KE, Lyons I, Rao RR, Stice SL, Nerem RM. Purified and proliferating endothelial cells derived and expanded in vitro from embryonic stem cells. **Endothelium** 2003; 10:329-336 (25 citations).
26. McCloskey KE,Chalmers JJ, Zborowski M. Magnetic Cell Separation: Characterization of Magnetophoretic Mobility. **Analytical Chemistry** 2003; 75:6868-6874 (115 citations).
27. McCloskey K,Moore LR,Hoyos M, Rodriguez A,Chalmers JJ, Zborowski M. Magnetic cell separation is a function of antibody binding capacity (ABC).  **Biotechnology Progress** 2003; 19(3):899-907 (42 citations).
28. Hoyos M, McCloskey KE, Moore LR, Nakamura M, Bolwell BJ, Chalmers JJ, Zborowski M. Pulse-injection studies of blood progenitor cells in a quadrupole magnetic flow sorter. **Separation Science and Technology** 2002; 37(4):1-23 (24 citations).
29. McCloskey KE, Comella K, Chalmers JJ, Margel S, Zborowski M. Mobility measurements allow quantitation of secondary antibody binding mechanisms. **Biotechnology and Bioengineering** 2001;75:642-655 (22 citations).
30. McCloskey KE, Chalmers JJ, Zborowski M. Measurement of CD2 Expression of IFN-Treated Fibrosarcomas using Cell Tracking Velocimetry. **Cytometry** 2001;44(2):137-147 (18 citations)
31. Moore LR, Rodriguez AR, Williams PS, McCloskey K, Bolwell BJ, Nakamura M, Chalmers JJ, Zborowski M. Progenitor cell isolation with a high-capacity quadrupole magnetic flow sorter. **Journal of Magnetism and Magnetic Materials** 2001; 225(1-2):277-284 (38 citations).
32. McCloskey KE, Chamlers JJ, Zborowski M. Magnetophoretic Mobilities Correlate to Antibody Binding Capacities. **Cytometry** 2000;40:307-315 (47 citations).
33. Hoyos M, Moore LR, McCloskey KE, Margel S, Zuberi M, Chalmers JJ, Zborowski M. Study of magnetic particles pulse-injected into an annular SPLITT-like channel inside a quadrapole magnetic field. **Journal of Chromatography A** 2000; 903:99-116 (44 citations).
34. Moore LR, Zborowski M, Nakamura M, McCloskey K, Gura S, Zuberi M, Margel S. Chalmers JJ. The use of magnetite-doped polymeric microspheres in calibrating cell tracking velocimetry. **Journal of Biochemical and Biophysical Methods** 2000;44:115-130 (48 citations).
35. Chalmers JJ, Haam S, Zhao Y, McCloskey K, Moore L, Zborowski M, Williams PS. Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Magnetic Susceptibility. **Biotechnology and Bioengineering** 1999;64:519-526.
36. Chalmers JJ, Haam S, Zhao Y, McCloskey K, Moore L, Zborowski M, Williams PS. Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Cellular Hydrodynamic Diameter. **Biotechnology and Bioengineering** 1999;64:509-518.

**CHAPTERS IN BOOKS**

1. *Invited*: Hatano R and McCloskey, KE. Tissue Engineering Approaches for Building Cardiac Tissue. In: **Frontiers in Stem Cell and Regenerative Medicine Research**,Atta-ur- Rahman and Shazia Anjum (ed), 2017: , Vol 7, 121-162, Betham Science, ISBN: 978-1-68108-553-1
2. *Invited*: McCloskey KE Biomimetic Multiscale Topography for Cell Alignment. In: **Emerging Trends in Cell and Gene Therapy**, Danquah MK and Mahato RI (ed.) 2013: 1st Edition, 471-484, Chapter 20, Springer, ISBN 9781627034173
3. *Invited*: McCloskey KE The Biophysical Basis | Effects of Shear Stress on Cells. In: **Comprehensive Biotechnology**, Murray Moo-Young (ed.) 2011: 2nd Edition, Volume 1, 615–623. Elsevier
4. *Invited:* McCloskey KE, Gilroy ME, Nerem RM. **Use of Embryonic Stem Cell-Derived Endothelial Cells as a Cell Source to Generate Vessel Structures *In Vitro*. In: Advances in Tissue Engineering, 2010, Volume 1, Chapter 25.**
5. *Invited:* Blancas AA, Lauer NE, and KE McCloskey KE. Endothelial Differentiation of Embryonic Stem Cells. In: Current Protocols in Stem Cell Biology. 2008 Sep;Chapter 5:Unit 1F.5 (11 citations).
6. McCloskey, K. E**.**, Stice, S.L., Nerem, R.M. (2006). In Vitro Derivation and Expansion of Endothelial Cells from Embryonic Stem Cells. In **Methods in Molecular Biology: Embryonic Stem Cell Protocols.** 2006, Volume II: Differentiation Models, pp. 287-301. Springer

### PATENTS

1. U.S. Application No. 13/152, 185 filed on June, 2, 2011: Serum-free culture medium and supplement

### ABSTRACTS/ PARTICIPATION AT CONFERENCE PROCEEDINGS

Oct 5, 2018 Wong L, Pegan J, Khine M, McCloskey KE. Leaf-inspired microvascular patterns, Bioprinting World Congress Select Bioscience, San Diego, CA.

Sept 6, 2018 Zamora J, Gopinathan A, McCloskey KE. Stochastic spatial and temporal population-based model for the co-emergence of vascular patterns TERMIS World, Kyoto, Japan.

July 12, 2018 Madfis N, Wong L, McCloskey KE. Tissue Stem Cell Sources for Building Vasculature in Microfluidic Systems, Tissue Engineering and Regenerative Medicine International, Paris, France.

Dec 13, 2016 Glaser DE, Turner WS, Gopinathan A, Madfis N, Wong L, Burns AB, McCloskey KE. Multifactorial Optimizations for Directing Endothelial Fate from Embryonic Stem Cells, Tissue Engineering and Regenerative Medicine Society (TERMIS), San Diego, CA.

Oct 24, 2016 Turner W, Glaser D, Gopinathan A, McCloskey KE. Mathematical Models for Directing Endothelial Fate from Embryonic Stem Cells International Conference on Stem Cell Engineering, Toronto, Canada

May 19, 2016 Turner W, Glaser D, Sa S, Gopinathan A, McCloskey KE. Multifactorial Optimizations for Directing Endothelial Fate from Embryonic Stem Cells, Mathematical Biology Workshop, Merced, CA

Jan 30, 2016 Glaser D, Turner W, Singh S, Filipp F, McCloskey KE. Cell seeding density correlates with a cellular metabolic switch during early stage vascular differentiation, Southern California Systems Biology Conference, Irvine, CA.

July 28, 2015 R Hatano, Turner W, Glaser D, Sa S, McCloskey KE.Vascularized Cardiac Tissue from Induced Pluripotent-derived Cardiomyocytes and Endothelial Cells, Tissue Science and Regenerative Medicine, Rome, Italy

July 21, 2015 Wong L, McCloskey KE. Role for Stiffness in Vascular Fate, Gordon Conference on Biomaterials and Tissue Engineering, Girona, Spain

Feb 4, 2014 Wong L, Drew Glaser D, Choi YS, Young J, Pegan J, Engler A, Pruitt B, Khine M, McCloskey KE, Mechanical Forces for Directing Vascular Cell Fate, American Society for Mechanical Engineering: Nanoengineering in Medicine and Biology, San Francisco, CA

Oct 27, 2013 Sa S, Wong L, McCloskey KE. Combinatorial Fibronectin and Laminin Signaling Promotes Highly Efficient Cardiac Differentiation of Human Embryonic Stem Cells, Biomedical Engineering Society, Seattle, WA

Oct 24, 2012 Blancas AA, Wong L, Glaser DE, and McCloskey KE. Generation of Tip/Stalk-like and Phalanx- like Endothelial Cells from Embryonic Stem Cells, Biomedical Engineering Society, Atlanta, GA

May 1, 2012 Blancas AA, Wong L, Glaser DE, and McCloskey KE. Tip/Stalk Endothelial Cells from Embryonic Stem Cells, Society for Biological Engineering: Stem Cell Engineering, Seattle, WA

Jan 18, 2012 Blancas AA and McCloskey KE. Angiogenic Endothelial Cells from Embryonic Stem Cells in Chemically Defined Medium, Keystone: Angiogenesis, Snowbird, UT

Dec 4, 2012 McCloskey KE, Endothelial Cell Phenotypes from Stem Cells, Micro-Nano Technologies in Medicine, Maui, Hawaii

Dec 7, 2012 Hatano R, Luna J, KE McCloskey, Multi-scale Biomimetic Topography for the for Alignment of Neonatal and Embryonic Stem Cell-derived Heart Cells, TERMIS, Orlando, FL

Oct 13, 2011 Blancas AA and McCloskey KE. Endothelial Cells from Embryonic Stem Cells in Serum-Free Conditions, BMES, Hartford, CT

Dec 7, 2010 Luna PJ, Ciriza J, Garcia-Ojeda M, Lieu DK, Li RA, Fowlkes CC, Khine M, McCloskey KE. Multi-scale Biomimetic Topography for the for Alignment of Neonatal and Embryonic Stem Cell-derived Heart Cells. TERMIS, Orlando, FL

Dec 11, 2009 KE McCloskey. Nanomaterials for Cardiovascular Stem Cell Engineering, 10th Annual Wound Healing: Science and Industry, St. Thomas, VI

March 17, 2009 AA Blancas, RM Nerem, KE McCloskey. Vascular Matrix Biology and Bioengineering Workshop II. Functional Vascular Derivatives for Building Microvasculature Tissue from Embryonic Stem Cells. Whistler, British Columbia.

April 14-15, 2008 AA Blancas, B Gennusa, KE McCloskey. Cell Culture Engineering XI. Embryonic Stem Cells Generate Functional Vascular Derivatives for Building Microvasculature Tissue. Sunshine Coast, Queensland, Australia.

March 14, 2008 AA Blancas and KE McCloskey. Serum-Free Endothelial Derivation and Expansion of Murine Embryonic Stem Cells. Tissue Engineering, Hilton Head, SC.

Jan. 21, 2008 AA Blancas and KE McCloskey. Serum-Free Derivation of Endothelial Cells from Embryonic Stem Cells. Stem Cell Engineering, Coronado Island, CA.

June 9, 2007 KE McCloskey, D Smith, H Jo, and RM Nerem, Incomplete Maturation of Embryonic Stem Cell-Derived Endothelial Cells. Tissue Engineering and Regenerative Medicine International Society (TERMIS), Toronto, Canada.

April 15, 2007 KE McCloskey, D Smith, H Jo, and RM Nerem, CA. Characterization of Embryonic Stem Cell-Derived Endothelial Cells. Keystone Symposium: Tissue Engineering and Developmental Biology, Snowbird, UT.

April 7, 2007 KE McCloskey Vascular Derivatives from Mouse Embryonic Stem Cell: An Overview. Young Investigators in Stem Cell Biology (YISCB). San Diego, CA

Oct 12, 2006 KE McCloskey, SL Stice, and RM Nerem. Biomedical Engineering Society, Chicago, IL. An In Vitro Model of Vascular Maturation from Embryonic Stem Cells: Endothelial versus Smooth Muscle

Sept 15, 2006 KE McCloskey, D Smith, H Jo, and RM Nerem, CA Tissue Engineering, Davis, CA. Incomplete Maturation of Embryonic Stem Cell-Derived Endothelial Cells

April 25, 2006 KE McCloskey, SL Stice, and RM Nerem. Regenerate, Pittsburgh, PA, Methodology For Differentiation, Purification And Expansion Of Vascular Endothelial And Smooth Muscle Cell From Embryonic Stem Cells

March 26, 2006 KE McCloskey, D Smith, H Jo, and RM Nerem. Keystone Symposia: Stem Cells, Whistler, BC, Incomplete Maturation of Embryonic Stem Cell-Derived Endothelial Cells

Dec. 13, 2005 KE McCloskey, D Smith, H Jo, and RM Nerem. American Society for Cell Biology, San Francisco, Ca, Embryonic Stem Cell-Derived Endothelial Cells and In Vivo-Derived Endothelial Cells: A Comparison

Oct. 1, 2005 KE McCloskey, D Smith, H Jo, and RM Nerem. Biomedical Engineering Society, Baltimore, MD, Comparison of Embryonic Stem Cell-Derived Endothelial Cells with In Vivo-Derived Endothelial Cells

July 12, 2005 KE McCloskey, M Gilroy, and RM Nerem. Biochemical Engineering XIV in Harrison Hot Springs, Canada, Embryonic Stem Cell-Derived Endothelial Cells as a Cell Source in the Development of Pre-Vascularized Materials

June 24, 2005 KE McCloskey, SL Stice, and RM Nerem. International Society of Stem Cell Research (ISSCR) in San Francisco, CA. Optimization of Vascular Endothelial Cell and Smooth Muscle Cell Differentiation, Purification and Expansion from Flk1+ Embryonic Stem Cells.

Mar. 10, 2005 KE McCloskey, SL Stice, and RM Nerem. Engineering Tissues 2005 Workshop in Hilton Head, SC. Optimization of Vascular Endothelial Cell and Smooth Muscle Cell Differentiation, Purification and Expansion from Flk1+ Embryonic Stem Cells.

Oct. 11, 2004 KE McCloskeyand RM Nerem. TESI-ETES Meeting in Lausanne, Switzerland. Smooth Muscle Cells Derived from Embryonic Stem Cells.

Sept. 13, 2004 KE McCloskey, SL Stice, and RM Nerem. Cardiovascular Regenerative Medicine in Bethesda, MD. Optimization of Vascular Endothelial and Smooth Muscle Cell Differentiation and Expansion from Flk+ Embryonic Stem Cells.

June 11, 2004 KE McCloskey, M Gilroy,and RM Nerem. Regenerate: Tissue Engineering the Human Body, Seattle, WA. Embryonic Stem Cell-Derived Endothelial Cells Exhibit Tubulogenesis in Collagen Gels

Jan. 26, 2004 KE McCloskey, SL Stice, and RM Nerem. Keystone Symposia – Stem Cells, Keystone, CO. An In Vitro Model of Endothelial Cell Maturation from Embryonic Stem Cells: Quantification of the Transient Expression Levels of Endothelial/Stem Cell Markers

Dec. 11, 2003 KE McCloskeyand RM Nerem. Tissue Engineering Society International (TESI) 6th Annual Conference in Orlando, FL. Changes in Expression Levels of Endothelial/Stem Cell Markers Correlate with Distinct Maturation Stages of Embryonic Stem Cells to Endothelial Cells

Nov 19, 2003 KE McCloskeyand RM Nerem. AIChE conference in San Francisco, CA. Embryonic stem cell-derived endothelial cells form vascular structures in collagen gels.

June 27, 2003 KE McCloskey, IG Lyons, RR Rao, SL Stice, and RM. Nerem. The American Society of Mechanical Engineers Summer Bioengineering Conference in Key Biscayne, FL. Pure populations of proliferating endothelial cells derived and expanded in vitro from embryonic stem cells.

March 3, 2003 KE McCloskey, SL Stice, and RM Nerem. The 6th International Congress of the Cell Transplant Society in Atlanta, GA. Uniform populations of endothelial cells derived and expanded from murine embryonic stem cells.

Feb. 27, 2003 KE McCloskey, SL Stice, and RM Nerem. Engineering Tissues 2003 Workshop in Hilton Head, SC. Endothelial cells derived, expanded, and characterized in vitro from mouse embryonic stem cells.

Oct. 25, 2002 KE McCloskey, IG Lyons, RR Rao, SL Stice, and RM. Nerem. Biomedical Engineering Society in Houston, TX. Endothelial progenitor cells from embryonic stem cells.

Oct. 20, 2002 KE McCloskey, IG Lyons, RR Rao, SL Stice, and RM. Nerem. Arthur M. Sackler colloquium in Irvine, CA entitled "Regenerative Medicine," sponsored by the National Academy of Sciences. Isolation of a pure population of endothelial cells from embryonic stem cells.

Sept. 26, 2002 KE McCloskey, IG Lyons, RR Rao, SL Stice, and RM. Nerem. Georgia Life Sciences Summit in Atlanta, GA. Endothelial progenitor cells from embryonic stem cells.

April 2, 2002 KE McCloskey, D Leigh, M Zborowski, JJ Chalmers. Cell Culture Engineering VII in Snowmass Village, CO. CD34 antigen expression on hematopoietic progenitor cells is related to efficiency of magnetic cell separation.

Nov. 8, 2001 KE McCloskey, D Leigh, M Zborowski, JJ Chalmers. AIChE Conference in Reno, NV. Analysis of Antigen Expression on Hematopoietic Progenitor Cells for Magnetic Cell Separation

June 11, 2001 KE McCloskey, M Zborowski, JJ Chalmers. Biochemical Engineering XII Conference in Rohnert Park, California. Characterization of magnetophoretic mobility: An overview

April 3, 2001 KE McCloskey, JJ Chalmers, L Moore, M Zborowski. ACS Conference in San Diego, CA. Performance of Continuous Magnetic Cell Separation is a Function of Cellular Antibody Binding Capacity

March 2, 2001 KE McCloskey, JJ Chalmers, M Zborowski. Lerner Research Institute Graduate Student Award Winning Papers - The Cleveland Clinic Foundation. Experimental and Theoretical Characterization of Magnetophoretic Mobility

Nov. 14, 2000 KE McCloskey, JJ Chalmers, K Comella, K Melnik, LR Moore, M Zborowski.

AIChE Conference in Los Angeles, CA. Immunomagnetic Cell Separation: Experimental and Theoretical Characterization of Magnetophoretic Mobility

Nov. 5, 1999 KE McCloskey, M Zborowski, JJ Chalmers. AIChE Conference in Dallas, TX. Does Cell Surface Marker Density (number) Indicate Cell Function?

Nov. 5, 1999 KE McCloskey, M Zborowski, JJ Chalmers. AIChE Conference in Dallas, TX. Quantification of the Number of Cellular Surface Antigens.

STUDENTS ADVISED

**Postdoctoral Students**

May, 2010 – May 2014 William Turner, Primary Advisor

William is working on the development of a cardiac patch using stem cell derivatives and natural extracellular matrices. NRSA post-doctoral fellow and CIRM stem cell trainee. Currently working for Nucleus Global.

**PhD Students**

August 2018 – presentMaria Mendoza, Primary Advisor

PhD student in UC, Merced’s Quantitative and Systems Biology (QSB) Graduate Group.

August 2017 – presentBasharat Jahan, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Resident Fellow 2018-2019.

Jan 2017 – presentJose Zamora, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group and CCBM Fellow, 2017. Jose is developing models the will predict cell fate from vascular progenitor cells.

Aug 2014 – presentEdwin Shen, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Edwin is studying the role of mechanical signaling in vascular smooth muscle cell fate. IGERT Fellow 2015-2016

May 2012 – presentAnley Tefara, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Anley is studying cardiac stem cell fate and functional signaling of stem cell-derived cells. NSF-funded STC Diversity Fellow 2011-2013, Mentored Research Fellowship 2013-2014

Aug 2013 – presentRachel Hatano, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Rachel is studying the development of a cell-based tissue graft for heart repair. IGERT Fellow 2013-2015.

Aug 2013 – Sept 2018Lian Wong, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Lian is studying the role of matix properties in cardiovascular cell fate. IGERT Fellow 2013-2015 and CCBM fellow 2017

Aug 2012 – Aug 2018Nicole Madfis, Primary Advisor

PhD student in UC, Merced’s Quantitative and Systems Biology (QSB) Graduate Group. Nicole is profiling the intrinsic angiogenic behavior of stem-cell derived endothelial subphenotypes. Dean’s Dissertation Award.

Aug 2009 – Dec 2014 Drew Glaser, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Drew is developed a novel dual reporter mouse embryonic stem cell line for endothelial and smooth muscle derivation to enable her studies in real time vascular development. IGERT Fellow 2011-2014, President’s Dissertation Year Fellow 2014. Progressed to postdoctoral position with Steve George at UC Davis.

Aug 2008- May 2013 Silin Sa, Primary Advisor

PhD student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Silin is working on cardiac stem cell differentiation from embryonic stem cells. Her work one best oral presentation at our UC-Systemwide Bioengineering Symposium, 2009. Progressed to research staff at Stanford University and now at Becton Dickinson.

Aug 2009 - Feb 2011 Jesus Luna, Primary Advisor

Graduate student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group. Jesus explored using nano-patterning for cardiac cell alignment. 2nd place in the UCM Research Day poster competition in 2010 and 1st place at NSF-funded Summer Institute on BioSensing and BioActuation at UIUC.

Dec 2005- Oct 2011 Alicia Blancas, Primary Advisor

PhD student and NIH pre-doctoral fellow in UC, Merced’s Quantitative and Systems Biology (QSB) Graduate Group. Alicia is characterizing the angiogenic and vasculogenic potential of embryonic stem cell derived-endothelial cells at 4 operationally defined stages of differentiation. Her research proposal was awarded a 4 year NRSA (pre-doctoral fellowship) by NIH. Progressed to postdoctoral position with Dr. Jane Grane-Allen at Rice University.

**M.S. Students**

Aug 2013 – Jan 2015 Yimy Villa, Primary Advisor

San Francisco University, CIRM Fellow

Aug 2006- May, 2009 Sarah Stolberg, Primary Advisor

M.S. student in UC, Merced’s Quantitative and Systems Biology (QSB) Graduate Group.

Aug 2007- May, 2009 Bing Xia, Primary Advisor

M.S. student in UC, Merced’s Biological Engineering and Small-scale Technologies (BEST) Graduate Group.