Jeffrey J. Chalmers

EDUCATION

B.A.	Natural Science, Westmont College, 1983 Dual degree program with the University of California, Berkeley
B.S.	Chemical Engineering, Univ. of California, Berkeley, 1983; with High Honors
Ph.D.	Chemical Engineering, Cornell University, 1988 Minor: Microbiology (6 courses) Dissertation: Studies on the continuous production and excretion of a plasmid encoded protein from *Escherichia coli* (Advisor: Michael L. Shuler; David Wilson, Co-Advisor, Department of Biochemistry)

PROFESSIONAL EXPERIENCE

August, 2021	Appointed Helen C Kurtz Chair in Chemical and Biomolecular Engineering.
July, 2001 -August 2021	Director, Analytical Cytometry Shared Resource, OSU Comprehensive Cancer Center and the D. M. Davis Heart and Lung Research Institute
July, 1999	Professor, Department of Chemical Engineering, The Ohio State University
Oct. 1993-1999	Associate Professor, Department of Chemical Engineering, The Ohio State University
April 1995-present	Adjunct Staff, Department of Biomedical Engineering, Research Institute, Cleveland Clinic Foundation
Jan 1988-Sept. 1993	Assistant Professor, Department of Chemical Engineering, The Ohio State University Teaching and research in biochemical engineering
Sept. 1983-Dec 1987	Graduate Student, Department of Chemical Engineering, Cornell University Studying continuous production of an excreted protein using immobilized E. coli cells
Sept 1982-Jun 1983	Undergraduate Research Assistant Department of Chemical Engineering, U. C. Berkeley (H. Blanch, and F. Arnold, advisors) Separated monoclonal antibodies using gel and affinity chromatography columns and determined the equilibrium binding curve for these antibodies on hapten-sepharose gel

HONORS

2023, Ohio State University Distinguish Scholar Award
2022, Clara M, and Peter L Scott Faculty Award for Excellence in Engineering Education
2021, Fellow, American Institute of Chemical Engineering
2021 Lumley Interdisciplinary Award
2014, Cell Culture Engineering Award, (Engineering Conferences International)
College of Engineering Lumley Research Award: 2011, 2006, 2001, 1997, 1993
2005, Fellow, American Association for the Advancement of Science
2005 AIChE 15C plenary lecture
2003 College of Engineering Harrison Award, ($14,000)
2001, Fellow, American Institute for Medical and Biological Engineering,
1998 College of Engineering Annual Research Accomplishment Award
1996 Distinguished Multidisciplinary Team Research Award, Ohio Agricultural Research and Development Center and The Ohio State University
NSF National Young Investigator Award, 1992-1997
Member, Tau Beta Pi, Phi Beta Kappa, **Sigma Xi**

PROFESSIONAL ACTIVITIES

Academic Editor	Scientific Reports
Academic Editor	PlosONE
Editorial Board	Biotechnology and Bioengineering, 2003-
Member	American Institute of Chemical Engineers
Member	American Chemical Society
Member	American Institute for Medical and Biological Engineering
Meeting Co-Chair	Cell Culture Engineering XV, Palm Springs, 2016
Meeting Co-Chair	Cell Culture Engineering VI, San Diego, Ca, 1998
Meeting Co-Chair	Cell Culture Engineering V, San Diego, Ca, 1996
Session Chair, Co-Chair	Advancing manufacture of Cell and Gene Therapies VI, January 27-31, 2019; Scale-up and Manufacturing of Cell-Based Therapies IV, Cell Culture

	Engineering XIII session chair, 2012; ACS National Meeting, 2010; AIChE Annual Meeting, 10/31-11/3, 2005; BioChem Eng XIV, July 10-14, 2005; Harrison Hot Springs, BC, Canada., AIChE Annual Meeting, November 2004; 5th Scientific and Clinical Applications of Magnetic Carriers, May, 2004, Lyon, France; AIChE Annual Meeting, November, 2003; 3rd Scientific and Clinical Applications of Magnetic Carriers, May, 2000, Rostock Germany; BioChem XI, July, 1999; 217th ACS National Meeting, March 1999; Scientific and Clinical Applications of Magnetic Carriers, May, 1998, Cleveland, OH; AIChE Annual Meeting, November 1994; AIChE November 1992; AIChE Annual Meeting, November 1992; AIChE Annual Meeting, November 1990;
Workshop Co-Chair	Cell Culture Engineering IX, Cancun, Mx 2004
Division Chair, AIChE 15 d/e	2001 – 2003
AIMBE Fellows Selection Subcommittee	2002-2009
Whitaker Scientific Advisory Panel	2002
NIH ISD Review panel	2005, 2007, 2008,
NIH ISD (Instrument Systems Development) study section Standing Member;	2009 -2013
NIH CMT study section:	2019, ad-hoc
NIH IMST 15 panel	2020
NCI IMAT Review Panel	1999- current (ad hoc)
NIH CADP-SEP	2011
NIH P41 Panel	2007, 2012, 2013
NIBIB Panel	2007
NCRR Review Panel	2003, 2004, 2009, 2010
NSF Review Panel	1992 (RIG, Instrument), 1993, 1995, 1998, 1996 (CAREER); 2006 BES panel, Career 2007, Biotechnology 2011,
NSF SBIR Panel	2001, 2006, 2009, 2015-2021.
NASA Review Panel	1996 Biotechnology of Microgravity Program
Invited Lecturer	2003 -2007 The SBP Bioprocessing Institute
Invited Guest Lecturer	1994-2002 ASME Bioprocess Equipment Seminar series
Secretary	Central Ohio Section of American Institute of Chemical Engineers
Guest Co-Editor	Chemical Engineering Sciences, Special Addition for 1st International Gas-Liquid and Gas-Liquid-Solid Reaction Engineering Conference, 1992
Judge	Columbus School District City-Wide Science Fair, 1990

TESTIFYING EXPERT WITNESS MATTERS:

Applikon Biotechnology, Inc, vs United States, Case No 07-00364; January, 2011
Genentech Inc. vs Amgen, Case No. 17-1407-CFC; February, 2019
Regenlab USA LLC v. ESTAR TECHNOLOGIES, ECLIPSE AESTHETICS LLC, HEALEON Medical, INC., Case No. 1:16-cv-8771. July, 2019 (Deposed, and Markman hearing presentation)
Regenlab USA LLC v. ESTAR TECHNOLOGIES, ECLIPSE AESTHETICS LLC, HEALEON Medical, INC., Case No. 1:16-cv-8771. Sept., 2019
CORNING INCORPORATED v.WILSON WOLF MANUFACTURING CORPORATION and JOHN R. WILSON, Case No. 0:20-700 (DWF/TNL), September, 2021
BECTON, DICKINSON AND COMPANY v. BECKMAN COULTER, INC., C.A. No. 21-833-CFC, October, 2021
CORNING INCORPORATED v.WILSON WOLF MANUFACTURING CORPORATION and JOHN R. WILSON, Case No. 0:20-700 (DWF/TNL), Markman hearing presentation, December 16, 2021, Deposed 6/30/2023
RAVGEN Vs Quest, Illumina Case No. April, 2022, June 2022.
Confidential Arbitration, December 2022

NON-TESTIFYING EXPERT WITNESS MATTERS:

Harvest Technologies Corp. v. Cesca Therapeutics Inc. Case No. 12-1354; November 2014.

Amgen vs. AbbVie, January, 2016.
Samsung vs. Genentech, February, 2018.
Amgen vs. Genentech, January, 2019.
Genentech vs Mylan, 2020.
Stem Express vs Conventa, Declaration, Jan, 2023.

RESEARCH GRANTS

1. **Evaluation of Stress response in high density cell culture,** Students support, Catalent Corporation
2. **Evaluations of spargers.** Mott Corporation.
3. **Development of single cell magnetophoresis to analyze and isolate glioma cancer stem cells. 03/11/2020 - 02/28/2023. NCI, R21CA250118.** Role: co-PI with Monica Venere
4. **Restricted Funding (Diversity Supplement-C. Gilbert): Fractionation of aged RBCs based on hemoglobin content.** 7/12019-12/31/2019.
5. **A scalable platform to selectively purify engineered extracellular vesicles via self-cleaving tags. National Inst. Gen Medical Scis. R21GM126543,** 7/1/2019-6/31/2021. Role: co-PI with David Wood.
6. **Fractionation of Aged RBCs Based on Hemoglobin Content. NHLBI, 1R01 HL131720-01A1**, 1/1/17-12/31/22 (Role: co-PI with Palmer).
7. **Multi-color immunohistochemistry staining of Genentech cells.** 10/31/2015-4/31/2016.
8. **Microcarrier cell shear collaboration, Millipore Merck,** RF 60046284. 1/1/2015-10/31/2015.
9. **Role of tumor-associated endothelial cells in chaperoning tumor cells.** NCI –R21CA17864. 7/2-14-6/30/16. (Role: Investigator)
10. **Targeted delivery of miroRNA-loaded microvesicles for cancer therapy**. NIH UH2TR000914-01. 1/1/2014-12/31/2019. Role: Co-Investigator
11. **Micellular Electrospray Synthesis of Magnetic Quantum Dots. NSF# 1206745.** (PI: Jessica Winter, coPIs: Barbara Wyslouzil (OSU), Jeffrey Chalmers (OSU), Gang Ruan (OSU)), $359,779. 7/10/2012-6/30/2015.
12. **Magnetic technologies for microalagal biofuel production.** GRT00025262 (PI of sub-contract: Chalmers). NSF Phase II SBIR awarded to Phycal, Inc. 4/31/12- 3/31/14
13. **CTC blood testing and Analysis. Navel Health Research Center (W911QY-10-C-0235).** Chalmers, P.I. **$**180,000, 1/1/2011-9/29/2013.
14. **Characterization of Millipore disposable bioreactor, Millipore Corporation**. Chalmers, P.I. $50,000. 9/1/2010-1/13/2011.
15. **Large-scale human placenta progenitor cell-derived erythrocyte production – continuous red blood cell production. Celgene Corp./DARPA, Phase II,** Chalmers P.I., $1,000,000. 1/1/10-07/31/12.
16. **(ARRA) CellTrap: A novel solid phase platform for analysis of stem/progenitor cells. Moldovan P.I. (RC2 AG036559)** National Institute on Aging $676,675, 9/1/2009-8/31/2010.
17. **Fluorescent-magnetic nanomaniputators for cytoskeletal mechanical investigations.** Winter P.I, Chalmers Co-P.I. NSF GRT00013770, $313,433, 6/1/09-5/31/2012.
18. **Characterization of Millipore disposable bioreactor, Millipore Corporation**. Chalmers, P.I. $50,000. 1/1/2009-1/31/2010.
19. **Large-scale human placenta progenitor cell-derived erythrocyte production – continuous red blood cell production. Celgene Corp./DARPA,** Chalmers P.I., $313,739, 9/7/08- 9/7/09.
20. **CCLI: Educational materials to enhance chemical engineering curricula with applications in biological engineering**. NSF Division Undergraduate Education (DUE-0816823) Komives, P.I., Chalmers, P.I. of sub-contract. $33,810.00, 7/1/2008-07/31/12.
21. **Commercialization of Magnetic Nanobeads for Cancer Cell Enrichment**. Columbus Nanoworks Inc subcontract from NIH, Chalmers P.I. of Subcontract. $7,500. 7/1/08-9/30/09.
22. **Magnetic Cell Sorting and Analysis.** NIH, (2R01 CA062349-15), Zborowski, P.I., Chalmers subcontract, 2/1/11-1/30/16. $716,118.
23. **Intracellular nanoprobes for physical manipulation of cells.** NSF Div Chem, Bioeng, Environ, & Transp S (35000309): CBET-0707969, J. Winter, P.I., Chalmers, Co-P.I. 06/15/2007 - 05/31/2008 $129,737.
24. **Advanced Biomedical Devices for Disease Diagnosis and Therapy**. State of Ohio Third Frontier Commission, $3,500,000, 7/1/06-6/31/09.
25. **Magnetic nanobeads for cancer cell separation,** Awarded to Columbus Nanoworks, NCI SBIR, 1R43CA116048-01, 7/1/05-12/31/05. $37,000 to OSU

26. **Magnetic sorter flow channels for pancreatic islet isolation**, NIDDK-SBIR Phase I, R44 HL74606-02, 7/1/05-12/31/05. $16,000 to OSU,
27. **Magnetic Sorter Channels for Stem Cells,** NHLBI-SBIR Phase II (1 R43 DK072647-01), (SHOT/Paul Todd, P.I.; Chalmers P.I. of sub-contract), 7/1/05-6/30/07. $40,000 to OSU
28. **Algal Shear Sensitivity,** Martek Biosciences Corp. 4/1/05-4/1/07. $50,000.
29. **NSEC Proposal for a Center for Affordable Nanoengineering of Polymer Biomedical Devices, NSF** EEC-0425626, 9/04-8/09; $12,900,000; (P.I. Jim Lee; Chalmers, Co-P.I.).
30. **An Integrated Magnetic Cell Identification System,** DOD, subcontract from Cleveland Clinic Foundation, $308,000, 5/04-4/07.
31. **Magnetic Separation of Liberated Islets During Isolation**, 1R01DK068757-01; 8/04-7/06. $209,838.
32. **Cell Selection by Magnetic Flow Sorting,** NIH-NCI**,** RO1 CA62349, 2/04-2/08, (P.I. Zborowski, Chalmers P.I. of sub-contract to OSU), $300,000.
33. **QMS Technology to Deplete T Cell Alloreactivity,** NIH-NIAID, 1 R01 AI056318-01, 3/04-2/09, (P.I. Farag, S., Chalmers, Co-P.I.), $3,200,000.
34. **Magnetic Sorter Channels for Stem Cells,** NHLBI-SBIR (1 R43 HL074606-01), 7/1/03-12/31/03, (SHOT/Paul Todd, P.I.; Chalmers P.I. of sub-contract), $6,000.
35. **Magnetic Sorter Channels for Rare Cancer Cells,** NSF SBIR (NSF 02-056; Proposal # 79440), 7/1/03-2/04, (SHOT/Paul Todd, P.I; Chalmers P.I. of sub-contract) $25,000.
36. **High Performance Magnetic Cell Sorting.** National Cancer Institute, 1 R01 CA97391-01A1 (PI: Chalmers) 5/03 - 4/07. $2,098,000.
37. **The development of theoretical and experimental characterizations of the magnetophoretic mobility of immunomatically labeled cells.** National Science Foundation, (BES-0124897) 7/1/02 - 6/31/05, $481,121 Chalmers, (P.I.); Zborowski, M., P.I. of sub-contract to CCF.
38. **Development of Quadrupole Magnetic Field-Flow Fractionation: Application to Characterization of Magnetic Colloids and Microparticles**, National Science Foundation, (CTS-0125657), 3/1/02-2/28/05, $289,207, Williams, P.S. (P.I.), Zborowski, M., Chalmers, J. Co-P.I. ($97,272 to O.S.U.)
39. **OSU Comprehensive Cancer Center Support Grant**, National Cancer Institute, 7/01/77-11/30/10, (5 P30 CA16058-26) Caliguiri, M. (PI), Chalmers, Investigator and Director of Analytical Cytometry Core, $151,000/yr.
40. **Cell Selection by Magnetic Flow Sorting**, National Cancer Institute, (RO1 CA62349) 1/00 - 1/31/04, $1,440,750; Zborowski, M. (P.I).; Chalmers P.I. of subcontract to OSU.
41. **Nanostructured Biocomposities for Use as Novel Films and Coatings.** National Science Foundation, 2/00-1/02, $100,000; Rathman, J (P.I.); Chalmers, J.
42. **Rapid Rare Cancer Cell Isolation For Molecular Diagnosis.** National Cancer Institute, (R33CA81662) 4/99 - 3/02, $1,050,000; Chalmers, J. (P.I.); Zborowski P.I. of sub-contract to CCF.
43. **Dynamic Mixing in Stirred Vessels: An Application of Particle Tracking Velocimetry and Flow Visualization in a Convected Frame of Reference**. National Science Foundation GOALI program, 9/99-12/02, $90,000 ($70,000 from NSF) Brodkey, R. (P.I.); Chalmers J.J.; Guezennec, Y.
44. **Determination of Cellular Properties based on the distribution of cell velocities induced by external fields**, National Science Foundation**,** (BES-9731059) 9/98- 7/01 (extended to 02), $460,180, Chalmers (P.I.), Zborowski P.I. of subcontract to CCF.
45. **Magnetic Flow Sorting for Clinical Stem Cell Isolation**. NOVAMEDICS (A Venture Capital Firm), 5/98-5/99, $375,000. Zborowski, M., Chalmers P.I. of sub-contract of to OSU.
46. **Improved Surfactants for Cell Culture.** NIH SBIR Phase I with Anatrace Inc., 1/1/98-12/31/98, $100,000, ($37,500 to P.I.)
47. **Characterization of bench and pilot scale bioreactors with respect to their hydrodynamic environment**. Genentech, 10/1/97-8/31/98, $22,360.
48. **Development of Analog Cell Separation Based on Surface Marker Density,** Whitaker Foundation, 4/1/97-4/1/98. $66,000.
49. **Cell Selection by Magnetic Flow Sorting,** National Cancer Institute, Division of the National Institute of Health, $514,902; Zborowski, M. (P.I.), Chalmers, J. 3/97-1/00.
50. **Ohio Bioprocessing Research Consortium,** Ohio Board of Regents, $1,450,000, Yang, S.T. (P.I.); Chalmers, J., and contributions from Battelle and U. of Akron. 1996.
51. **Engineering Research Equipment: A Rheological Measurement System for Polymers and Composite Processing, and Rheology of Colloids, Emulsions, Polymers Solutions, and Biomaterials**, Lee, J., Zakin, J., Koelling, K., Rathman, J., Chalmers, J. National Science Foundation, $360,000, 8/94.

52. **Dynamics of Biological Energy and Nitrogen Availability During Composting/Utilization**, Targeted Interdisciplinary Seed Grant Award, The Ohio State University Office of Research, $84,975, 1994-96, Co-P.I.'s H.A. Hoitink, W.A. Dick, H. M. Keener
53. **Renovation of Laboratories for Biochemical and Bioprocess Engineering Research,** National Science Foundation, $234,199 (total award with match $468,398), 1994, Yang, S.T., Zakin, J., Chalmers, J.
54. **Continuous Magnetic Cell Sorting,** National Cancer Institute, (RO1 CA62349), Zborowski, M. (P.I.), Chalmers, J., $550,000**,** 1994-97.
55. **Development of a Continuous, Magnetic Cell Separator**, Whitaker Foundation, $180,000, 12/93-12/96, Chalmers, J., (P.I.), Zborowski, M.
56. **Applications and Development of Biochemical Engineering Principles to the Production of Soil Amendments**, The Consortium for Plant Biotechnology Research, Inc., 7/93-6/95, $95,128
57. **National Young Investigator Award**, National Science Foundation, (BCS9258004) 7/92-7/98, $237,500.
58. **Cargill Inc**., 5/93-6/94, $11,000
59. **AMGEN Inc.**, 1/93, $10,000; 12/92, $4,500 in equipment
60. **Eli Lilly**, 5/93, $3,500; 12/91, $3000
61. **Chemineer**, 5/93, $2,500
62. **Determination of the Mechanisms of Cell Adhesion to Damage from Air-Liquid Interfaces,** Principal Investigator with Dr. W.F. Hink (Entomology), National Science Foundation, 7/91- 7/93, $137,300.
63. **DuPont Young Faculty Development Award**, 1989-1991, $75,000, joint with Dr. S.T. Yang.
64. **Studies on the Effect of Hydrodynamic Shear Stress on Suspended Insect Cells**, 3/89 to 9/90, Seed Grant, Office of Research and Graduate Studies, Ohio State University, $16,000.

U.S. Patents

1. Chalmers JJ, Melnik K, Lara-Velasco, OR, Tong X, Zborowski M, Moore LR, Farag S. **Biological Cell Separator and Disposable Kit**. US Patent 9,176,111; 2015
2. Sooryakumar, Ratnasingham; Henighan, Thomas Charles; Vieira, Gregory B.; Chalmers, Jeffrey J. **Magnetic platforms for biomolecule trappings, manipulations, and sorting**, Patent Number :US 08906691. December 9, 2014.
3. Sooryakumar, Ratnasingham; Sooryakumar, Dhriti; Vieira, Gregory; Chalmers, Jeffrey J. **Mobile magnetic traps and platforms for micro/nano particle manipulation.** U. S. Patent 6,623,984, March 19, 2013
4. Chalmers, J.J, Wu, W, Rathman, **Compositions for reducing cell adhesion to bubbles**. U.S. Patent 08440800 May 14, 2013.
5. Fleischman, A., Roy, S., Chalmers, J., Zborowski, M. **MEMS-BASED Integrated Magnetic Particle Identification System**. U. S. Patent 6,623,984, Sept. 2003.
6. Zborowski, M., Chalmers, J.J., Moore, L. **System and device for determining particle characteristics.** U.S. Patent 6,557,430, May 2003
7. Zborowski, M., Chalmers, J.J., Moore, L. **System and Device for determining particle characteristics**. U.S. Patent 6,412,359, October, 2002.
8. Zborowski M, Chalmers PS, Moore LR. **Continuous particle and molecule separation with an annular flow channel**, U.S. Patent 6,467,630, October 2002.
9. Zborowski, M., Chalmers, J.J. Moore, L. **System and Device for Determining Particle Characteristics**, U.S. Patent 6,082,205; 2000.
10. Zborowski, M., Chalmers, J.J. Moore, L. **Fractional cell sorter**, U.S. Patent 6,120,735, 2000.
11. Zborowski, M., Chalmers, J.J. Moore, L. **Method for determining particle characteristics** , U.S. Patent 6,142,025, 2000.
12. Zborowski, M., Chalmers, J.J. Moore, L., **Method for magnetically separating cells into fractionated flow streams,** U.S. Patent 5,968,820, 1999.
13. Zborowski, M., Chalmers, J.J. Moore, L. **Method for Determining Particle Characteristics,** U.S. Patent 5,974,901, 1999.

Publications Cited 100 or More Times

1. McCloskey, K., Chalmers, J.J., Zborowski, M., Magnetic Cell Separation: Characterization of Magnetophoretic Mobility, *Analytical Chemistry* 75(4):6868-6874. 2003. PMID:14670047.
2. Zborowski, M., Ostera, G.R., Moore, L.R., Milliron, S., Chalmers, J.J., Schechter, A.N. Red Blood Cell Magnetophoresis, Biophysics Journal, 84:2638-2645. 2003.
3. Zborowski, M., Sun. L., Moore, L.R., Williams, P.S., Chalmers, J.J. Continuous cell separation using novel magnetic quadrupole flow sorter, J. of Magnetism and Magnetic Materials. 194:224-230, 1999.

4. Lara, O., Tong, X., Zborowski, M., Chalmers, J.J. Enrichment of Rare Cancer Cells through Depletion of Normal Cells Using Density and Flow-Through, Immunomagnetic Cell Separation. Experimental Hematology Oct;32(10):891-904. 2004. PMID: 15504544
5. Yang, L., Lang, J.C., Balasubramanian, P., Jantana, K.R., Schuller, D., Agrawal, A., Zborowski, M., Chalmers, J.J. Optimization of an Enrichment process for Circulating tumor cells from the blood of Head and Neck Cancer patients through depletion of normal cells. Biotechnol. Bioeng. 102 (2):521-534. 2009. PMID: 18726961
6. Agarwal, M., Koelling, K., Chalmers, J.J., Characterization of the Degradation of Poly-Lactic Acid in a Well Controlled Composting System, Biotechnology Progress, Vol. 14:517-526, 1998.
7. Chalmers, J., Zborowski, M., Sun, L., Moore, L., Flow Through, Immunomagnetic Cell Separation, *Biotechnology Progress,* Vol. 14:141-148, 1998.
8. Zborowski, M, Chalmers, J.J. Rare Cell Separation and Analysis by Magnetic Sorting. Analytical Chemistry 83(21):8050-8056. 2011. PMID:21812408; PMCID:3205221; NIHMS319811
9. Ma, N., Koelling, K., Chalmers, J.J. The Fabrication and Use of A Transient Contraction Flow Device to Quantify the Sensitivity of Mammalian and Insect Cells to Hydrodynamic Forces, Biotechnology and Bioengineering 80:428-437. 2002; PMID: 15296446.
10. Zhu, X., Badawi, M., Pomeroy, S. M.,Sutaria, D.S., Xie,, Z., Baek, A., Jiang, J., Elgamal, O J, Mo, X., Perle, K.L., Chalmers, J.J, Schmittgen, T.D., Phelps, M. Comprehensive toxicity and immunogenicity studies reveal minimal effects in mice following sustained dosing of extracellular vesicles derived from HEK293T cells, ***Journal of Extracellular Vesicles*** 6(1), 1324730. 2017.
11. Chalmers, J.J., Kim, E., Telford, J.N., Shuler, M.L., Wilson, D.B., Effects of Temperature on the Stability of Escherichia coli Overproducing β-lactamase or Human Epidermal Growth Factor, Applied and Environmental Microbiology, 56:104-111, 1990.
12. Zborowski, M., Fuh, C.B., Green, R., Sun, L., Chalmers, J.J., Analytical Magnetopheresis of Ferritin-labeled Lymphocytes, Analytical Chemistry, 67(20):3702-3712, 1995
13. Chalmers, J.J., Bavarian, F., Microscopic Visualization of Insect Cell-Bubble Interactions II: The Bubble Film and Bubble Rupture, Biotechnology Progress, 7:151-158, 1991.
14. Hu, W. Berdugo, C., Chalmers, J.J. The potential of hydrodynamic damage to animal cells of industrial relevance: current understanding. *Cytotechnology* 63:445-460. 2011. PMID: 21785843.
15. Zborowski, M. Chalmers, J.J. Magnetic cell separation, 2011. Elsevier.
16. Sun, L., Zborowski, M., Moore, L., Chalmers, J.J., Continuous, Flow-Through Immunomagnetic Cell Separation in a Quadrupole Field. Cytometry. 33:469-475. 1998.
17. Vieira, G., Heninghan, T., Chen, A., Hauser, A.J., Yang, Y., Chalmers, J.J., Sooryakumar, R. Magnetic wire traps and programmable manipulation of biological cells. Physical Review Letters, 103:128101, 2009.
18. Jing, Ying, Moore, LR, Schneider, T., Williams, PS, Chalmers, JJ., Farag, SS, Bolwell, B., Zborowski, M. Blood progenitor cell separation from clinical leukapheresis product by magnetic nanoparticle binding and magnetophoresis *Biotechnol Bioeng*. 96(6):1139-1154, 2007. PMID: 17009321
19. Jatana, KR, Balasubramian, P., Lang, JC, White, E., Agrwal, A., Ozer, E., Schuller, DE, Teknos, TN, Chalmers, JJ. Significance of circulating tumor cells in patients with squamous cell carcinoma of the head and neck. *Archives of Otolaryngology--Head and Neck Surgery*, 136(12):1274-1279. 2010. PMID: 21173379
20. Bavarian, F., Fan, L.S., Chalmers, J.J., Microscopic Visualization of Insect Cell-Bubble Interactions I: Rising Bubbles, Air-Medium, and the Foam Layer, *Biotechnology Progress*, 7:140-150, 1991.
21. Balasubramanian, P., Lang, J.C., Jatana, K., Miller, B., Schuller, D., Agrawal, A., Lustberg, M., Zborowski, M., Chalmers, J.J. Multiparameter analysis, including EMT markers, on negatively enriched blood samples from patients with squamous cell carcinoma of the head and neck. *PLoSONE.* 7:1-11, e42048, 2012; PMID:22844540; PMCID: PMC3406036.
22. Gregoriades, N., Clay, J., Ma, Ningning, Koelling, K., Chalmers, J. Cell Damage of Microcarrier Cultures as a function of Local Energy Dissipation created by a Rapid Extensional Flow*, Biotechnology and Bioengineering* 69:171-182, 2000. PMID: 10861396
23. Chalmers, J.J., Zhao, Y., Nakamura, M., Melnik, K. Lasky, L., Moore, L., Zborowski, M., An Instrument to determine the magnetophoretic mobility of paramagnetic particles and labeled, biological cells. J. of Magnetism and Magnetic Materials. 194:231-241, 1999.
24. Moore, L.R., Fujioka, H., Williams, P.S., Chalmers, J.J., Grimberg, B., Zimmerman, P., Zborowski, M., Hemoglobin degradation in malaria-infected erythrocytes determined from live cell magnetophoresis; FASEB J. 2006 Apr;20(6):747-9.
25. Gómez-Pastora, J, Mitchell Weigand; James Kim; Xian Wu; Jacob Strayer; Andre F Palmer; Maciej Zborowski; Mark Yazer; Jeffrey J Chalmers, Hyperferritinemia in critically ill COVID-19 patients - Is ferritin the product of inflammation or a pathogenic mediator? ***Clinica Chimica Acta,*** Oct. 509:249-251. 2020

26. Mollet, M., Ma, N., Zhao, Y., Brodkey, R., Taticek, R., Chalmers, J. Bioprocess Equipment: Characterization of Energy Dissipation Rate and its potential to Damage Cells. Biotechnology Progress 20:1437-1448. 2004; PMID: 15458328
27. Lustberg, M., Balasubramanian, P., Miller, B., Garcia-Villa, A., Deighan, C., Wu, Y., Carothers, S., Berger, M., Ramaswamy, B., Macrae, E., Wesolowski, R., Layman, R., Morzek, E., Pan, X., Summers, T., Shapiro, C., Chalmers, J.J. Heterogeneous atypical cell populations are present in blood of metastatic triple negative breast cancer. ***Breast Cancer Research*** 16(2):R23. 2014. PMCID: PMC4053256, PMID:24602188

COMPLETE LIST OF REFEREED PUBLICATIONS

28. Strayer, J., Choe, H., Wu, X., Weigand, M., Gómez-Pastora, J., Kollin, J., Venere, M., Desai, P., Palmer, A. Zborowski, M., Chalmers, J.J. Increased performance of label-free magnetic separation of intrinsically magnetic cells in catch and release mode. Submitted to ***Biotechnology and Bioengineering***.
29. Strayer, J., Choe, H., Wu, X., Weigand, M., Gomez-Pastora, J., Zborowski, M., Chalmers, J.J., Method for Measuring Magnetic Force Field Distributions in Microfluid Devices Compared to Simulations using COMSOL Submitted to ***Electrophoresis.***
30. Bedard1, M.C, Chihanga, T., Carlile, A., Jackson, I.R., Brusadelli, M.G., Lee, D., VonHandorf, A., Rochman, M., Dexheimer, P.J., Chalmers, J.J., Nuovo, G., Lehn, M., Williams, D.R.J., Kulkarni, K., Carey, M., Jackson, A., Billingsley, C., Tang, A., Zender, C., Patil, Y., Wise-Draper, T.M., Herzog, T.J., Ferris, R.L.,, Kendler, A., Bruce J. Aronow, B.J.,Kofron, M., Rothenberg, M.E., Weirauch, M.T., Van Doorslaer , K.Wikenhe, K.A., Brokamp, W., Lambert, P.F., Adam, M., Potter, S., Wells, S.I. Single cell transcriptomic analysis of HPV16-infected epithelium identifies a keratinocyte subpopulation implicated in cancer. In Press in ***Nature Communications***.
31. Moore, L.R., Smith, N.A., Pike, S.J., Weigand, M., Gomez-Pastora, J., Strayer, J., Palmer, A.F., Chalmers, J.J., Zborowski, M. Red Blood cell magnetophoresis as a function of oxygen partial pressure. ***Journal of Magnetism and Magnetic Materials***. Vol. 564, 169982, 2022.
32. Mitchell Weigand, Jenifer Gomez-Pastora, Andre F. Palmer, Maciej Zborowski, Payal C. Desai, and Jeffrey J. Chalmers, Continuous-Flow Magnetic Fractionation of Red Blood Cells Based on Hemoglobin Content and Oxygen Saturation – Clinical Blood Supply Implications and Sickle Cell Anemia Treatment, ***Processes, Vol.*** 10, No.5, 927, 2022
33. Lu, S., Allyn, M., Weigand, M., Weigand, M., Chalmers, J.J., Palmer, A.F. Tangential flow filtration facilitated washing of human red blood cells: A proof-of-concept study. ***Vox Sanguinis***, 2022
34. Gómez-Pastora, J.,Weigand, M., Kim, J. Palmer, A.F. Yazer, M., Desai, P.C., Zborowski, M., Chalmers, J.J. Potential of cell tracking velocimetry as an economical and portable hematology analyzer. ***Scientific Reports***, 12:1, 1-12. 2022.
35. Gomez-Pastora, J., Strayer, J., Wu, X, Choe, H., Lu, S., Plencner, E., Landes, K., Palmer, A., Zborowski, M., Desai, P.C., Chalmers, J.J. The unique magnetic signature of sickle red blood cells: A comparison between the red blood cells of transfused and non-transfused sickle cell disease patients and healthy donors. ***IEEE Transactions on Biomedical Engineering***, doi: 10.1109/TBME.2022.3172429. 2022.
36. Wu, X., Gómez-Pastora, J., Zborowski, M., Chalmers, J.J. SPIONs self-assembly and magnetic sedimentation in quadrupole magnets: Gaining insight into the separation mechanisms, ***Separation and Purification Technology*** 280, 119786. 2022.
37. Chalmers, J.J. The challenges of hydrodynamic forces on cells used in Cell Manufacturing and Therapy, ***Current Issues in Biomedical Engineering.*** 20, 100357, 2021.
38. González-Fernández, C., Gómez-Pastora, J., Bringas, E., Zborowski, M., Chalmers, J.J., Ortiz, I. Recovery of Magnetic Catalysts: Advanced Design for Process Intensification. ***Industrial & engineering chemistry research*** 60 (46), 16780-16790. 2021.
39. Gómez-Pastora, J, Kim, J., Multane, V., Weigand, M., Walters, N.A., Reategui, E., Palmer, A.F., Yazer, M., Zborowski, Z., Chalmers, J.J. Intrinsically magnetic monocytes subtypes: Non-classical and intermediate monocytes have the strongest magnetic behavior in fresh human blood. ***Experimental Hematology*** Vol. 99, p21–3, 2021
40. Weigand, M.R.H., Gómez-Pastora, J., Kim, J., Kurek, M., Hickey, R., Irwin, D.C., Buehler, P.W., Zborowski, M., Palmer. A., Chalmers, J.J. Magnetophoretic and Spectral Characterization of Oxyhemoglobin to Deoxyhemoglobin: Chemical vs Enzymatic Process, ***PlosOne*** Vol. 16:9, e0257061. 2021.

41. González Fernández, Cristina, Gómez Pastora, Jenifer, Basauri, Arantza, Fallanza, Marcos, Bringas, Eugenio, Chalmers, Jeffrey J., Ortiz, Inmaculada, Continuous-flow separation of magnetic particles from biofluids: how does the microdevice geometry determine the separation performance?, ***Sensors,*** 20:3030. 2020.
42. Roodan, V.A., Gómez-Pastora, J, Karampelas, I.H., Gonzalz-Fernandez, C., Bringas, E., Ortiz, I., Chalmers, Jeffrey J. Fulrani,E.P., Swihard M.T. Formation and manipulation of ferrofluid droplets with magnetic fields in a microdevice: a numerical parametric study*,* ***Soft Matter***, Oct 28; 16(41):9506-9518. 2020.
43. Robert Wesolowski, Daniel G Stover, Maryam Lustberg, Abigail Shoben, Meng Zhao, Ewa Mrozek, Rachel M Layman, Erin Macrae, Wenrui Duan, Jun Zhang, Nathan Hall, Chadwick L Wright, Katharina Schregel, Susan Gillespie, Michael Berger, Andrea Camp, Jeffrey J Chalmers, Prija Balasubramanian, Brandon L Miller, Peter Amaya, Eleni Andreopoulou, Joseph Sparano, Charles L Shapiro, Miguel Angel Villalona-Calero, Susan Geyer, Alice Chen, Michael R Grever, Michael V Knopp, Bhuvaneswari Ramaswamy Phase I study of veliparib on an intermittent and continuous schedule in combination with carboplatin in metastatic breast cancer: A safety and [18F]-fluorothymidine PET biomarker study, ***Oncologist***. Aug; 25(8): 3-1158-e1169. 2020
44. Gómez-Pastora, J, Wu, X., Sundar, N., Alawi, J., Nabar, G., Winter, J.O., Zborowski, Z., Chalmers, J.J. Self-Assembly and sedimentation of 5 nm SPIONs using horizontal, high magnetic fields and gradients, ***Separation and Purification Technology***. Vol. 248, 117012, 2020.
45. Mahajan, Kalpesh D., Ruan, Gang, Vieira, Greg, Porter, Thomas, Chalmers, Jeffrey J., Sooryakumar, Winter, Jessica O. , Biomolecular Detection, Tracking, and Manipulation using a Magnetic-Quantum Dot Platform, ***Journal of Materials Chemistry B.***, 8, 3534-3541. 2020,
46. Kim, J. Gómez-Pastora, J., Gilbert, C., Weigand, M., Walters, N.A., Reátegui, E., Palmer, A.P., Yazer, M., Zborowski, M., Chalmers, J.J. Quantification of the mean and distribution of hemoglobin content in normal human blood using cell tracking velocimetry. ***Analytical Chemistry***. 92(2):1956-1962. 2020.
47. Kim, J., Gomez-PAstora, J., Weigand, M, Polgoeter. M., Walter, N., Reategui, E., Palmer, A., Zborowski, M., Yazer, M.H., Chalmers, Jeffrey, A subpopulation of monocytes in normal human blood has significant magnetic susceptibility; quantification and potential implications. ***Cytometry, part A.*** 95(5):478-487**.** 2019.
48. Park, K., Kim, J., Testoff, T., Adams J., Poklara, M., Zborowski, M., Venere, M., Chalmers, J.J., Quantitative Characterization of the Regulation of Iron Metabolism in Glioblastoma Stem-Like Cells using Magnetophoresis. ***Biotechnology and Bioengineering.*** 116(7):1644-1655. 2019; PMCID: PMC6693654. 2019.
49. Kim, James,Weigand, Mitchell, Palmer, Andre F., Zborowski, M., Yazer, M.H., Chalmers, Jeffrey, Single Cell Analysis of Aged RBCs: Quantitative analysis of the aged cells and byproducts, ***the Analysis***t. 144(3):935-942. 2019. PMCID: PMC6506859.
50. Xue, W., Moore, L.R., Nakano, N., Chalmers, J.J., Zborowski, M. Single cell magnetometry by magnetophoresis vs. bulk cell suspension magnetometry by SQUID-MPMS – a comparison. ***Journal of Magnetism and Magnetic material*** 474:152-160. 2019.
51. Aljohani, HM Aljohani, M., Furgason, JM, Amaya, P., Deeb, A., Chalmers, J.J., Bahassi, E.M. The role of Nrf2-Keap1 pathway in the survival of circulating metastatic cancer cell, **Cancer Research** 78 (13 Supplement), 83-83. 2018.
52. Lustberg, M.B., Stover, D.G., Chalmers, J.J. Implementing Liquid Biopsies in Clinical Trials: State of Affairs, Opportunities, and Challenges. ***The Cancer Journal*** 24(2):61-64. 2018; PMCID: PMC5880324.
53. Aljohani, HA, Furgason, J.M., Amaya, P. Deeb, A., Chalmers, J.J., Bahassi, E., Genetic Mutations Associated with Lung Cancer Metastasis to the Brain, ***Mutagenesis***. 33 (2), 137-145. 2018.
54. Moore, L.R., Yazer, M., Zborowski, M., Chalmers, J.J. Continuous, intrinsic magnetic depletion of erythrocytes from whole blood with a quadrupole magnet and annular flow channel; pilot scale study. ***Biotechnology and Bioengineering***. 115 (6):1521-1530. 2018; PMCID: PMC6311700.
55. Sun, J., Moore, L., Xue, W., Kim, J., Zborowski, M., Chalmers, J.J. Correlation of simulation/finite element analysis to the separation of intrinsically magnetic spores and red blood cells using a microfluidic magnetic deposition system. ***Biotechnology and Bioengineering***. 115 (5): 1288-1300. 2018. PMCID: PMC6338348.
56. Mahajan, K.D., Cui, Y., Dorcéna, J., Bouxien, N.F., Bachand, G.D., Chalmers, J.J., Winter, J.O, Magnetic Quantum Dots Steer and Detach Microtubules from Kinesin-Coated Surfaces. ***Biotechnology Journal***. 13:1700402, 2018.
57. Mahajan, K.D., Nabar, G.M., Xue, W., Anghelina, M., Moldovan, N, Chalmers, J., Winter, J. Mechanotransduction effects on endothelial cell proliferation via CD31 and VEGFR2: Implications for Immumomagnetic Separation. ***Biotechnology Journal***. 12(9), 2017.
58. Similer, J.L. Chalmers, J.J, Hahn, J.3 and Rapiejko, P.J. The Impact of a Flow-through External Circulation Loop on Cell Growth and Metabolism. Accepted in ***Journal of Biotechnology***

59. Sutaria,D. Jiang,J., Phelps, M. , Elgamal, O., Pomeroy, S. M., Badawi, M. A., Chalmers, J. J. , Clara, A., Zhu, X., Li, C., Low Active Loading of Cargo into Engineered Extracellular Vesicles Results in Inefficient miRNA mimic delivery, ***Journal of Extracellular Vesicles*** 6 (1), 1333882. 2017.
60. Chalmers, J.J., Jin, X., Palmer, A., Yazer, M., Moore, L., Pan, J., Park, J. Zborowski, M., Femtogram resolution of iron content per cell: storage of red blood cells leads to loss of hemoglobin. ***Analytical Chemistry*** 89(6):3702-3709. 2017. NIHMSID918420; PMCID:PMC5685515.
61. Moore, Lee. R., Williams, P.S., Chalmers, J.J., Zborowski, M., Tessellated permanent magnetic circuits for flow-through, open gradient separations of weakly magnetic materials. ***J. of Magnetism and Magnetic Materials***. Vol. 427:325-330. 2017. PMCID:PMC5667671.
62. Wu, Y., Deighan, C.J., Park, K.J., Amaya, P., Zborowski, M., Lustberg, M., Chalmers, J.J. Multiparmeter Evaluation of the Heterogeneity of Circulating Tumor Cells Using Combined RNA in situ Hybridization and Immunoctyochemical Analysis, ***Frontiers in Oncology. 6,*** 2016.
63. Mahajan, K.D. Ruan, G., Dorcena, C., Vieira, G., Nabar, G., Bouxsein, N., Chalmers, J.J., Bachand, G.D., Sooryakumar, R., Winter, J.O. Steering Microtubule Shuttle Transport with Dynamically Controlled Magnetic Fields. ***Nanoscale*** 8:8641-8649. 2016.
64. KP McMullen, JJ Chalmers, JC Lang, P Kumar, KR Jatana, Circulating tumor cells in head and neck cancer: A review, ***World Journal of Otorhinolaryngology-Head and Neck Surgery*** 2 (2), 109-116. 2016.
65. Jatana, K.R., Balasubramanian, P., McMullen, K.P., Lang, J.C., Teknos, T., Chalmers, J.J. Effect of surgical intervention on circulating tumor cells in patients with squamous cell carcinoma of the head and neck using a negative enrichment technology. ***Head and Neck***. June 5, 2016.
66. Gallardo-Rodrigguez, J.J., Lopez-Rosles, L., Sanchez-Miron, A., Garcia-Camacho, F., Molina-Grima, E., Chalmers, J.J. New insights into shear-sensitivity in dinoflagellate microalgae. ***Bioresource Technology***. 699-705. 2016.
67. Chalmers, J.J. Mixing, aeration and cell damage, 30+ years later: what we learned, how did it affect the cell culture industry and what would we like to know more about, ***Current Opinions in Chemical Engineering***, Vol 10:94-102. 2015.
68. Joao Paulo Oliveira-Costa, Alex Fiorini de Carvalho, Giorgia Gobbi da Silveira1,Peter Amaya3, Yongqi Wu, Kyoung-Joo Jenny Park, Mabel Pinilla Gigliola, Maryam Lustberg, Marcilei Eliza Cavicchioli Buim, Elisa Napolitano Ferreira, Luiz Paulo Kowalski, Jeffrey J. Chalmers, Fernando Augusto Soares, Dirce Maria Carraro, Alfredo Ribeiro-Silva, Gene expression patterns through oral squamous cell carcinoma development: PD-L1 expression in primary tumor and circulating tumor cells. ***OncoTarget.*** 28;6(25)20902-20. 2015. PMID26041877.
69. Barrow, M, Taylor, A ,Nieves, DJ, Bogart, LK,, Mandal, P.,Collins, CM , Moore, LR, Chalmers, JJ, Levy, R Williams, SR, Murray, P, Rosseinsky, MJ, Adams, DJ, Tailoring the surface charge of dextran-based polymer coated SPIONs for modulated stem cell uptake and MRI contrast, ***Biomaterials Science***. 3(4):608-616. 2015. PMID26222421.
70. Buck, A., Moore, L.R., Lane, C.D., Kumar, A., Stroff, C., White, N., Xue, w., Chalmers, J.J., Zborowski, M., Magnetic separation of algae genetically modified for increased intracellular iron uptake ***Journal of Magnetism and Magnetic Material.*** 380:201-204. 2015.
71. Mathsyaraja, H., Thies, K., Taffany, D.A., Deighan, C., Liu, T., Pecot, T., Yu, L., Fernandez, S.A., Shapiro, C., Otero, J., Timmers, C., Lustberg, M.B., Chalmers, J.J., Leone, G., Ostrowski, M.C. CSF1 Induces Oncogenic microRNAs in Macrophages to Drive Metastatic Tumor Growth. ***Oncogene*** 34(28):3651-3661. 2015.
72. Moore, L., Williams, P. S., Nehl, F., Abe, K., Chalmers, J.J., Zborowski, M. Feasibility study of red blood cell debulking by magnetic field-flow fractionation with step-programmed flow. ***Analytical and Bioanalytical Chemistry,*** 406(6):1661-70. 2014.
73. Wu, Y., Clayton Deighan, Brandon Miller, Priya Balasubramanian, Maryam Lustberg, Maciej Zborowski, Jeffrey Chalmers. Isolation and analysis of rare cells in the blood of cancer patients using a negative depletion methodology. ***Methods***. 64(1):169-182. 2013.
74. Chen, A, Byvank, T., Chang, W-J., Bharde, A., Vieira, G., Miller, B., Chalmers, J.J., Bashir, R., Sooryakumar, R. On-chip Magnetic Separation and Cell Encapsulation in Droplets. ***Lab Chip*** 13(6):1172-1181. 2013. NIHMSID: NIHMS619019, PMCID: PMC4176703, PubMed # 23370785
75. Moore, LR, Nehl, F., Dorn, J., Chalmers, J.J., Zborowski, M. Open Gradient Magnetic Red Blood Cell Sorter evaluation on Model Cell Mixtures, ***IEEE Transactions on Magnetics*** 49(1):309-315. 2013.
76. K.D. Mahajan, G. Vieira, G. Ruan, B.L. Miller, M. Lustberg, J.J. Chalmers, R. Sooryakumar, J.O. Winter (Invited), "MagDot-Nanoconveyer Assay for Detection and Isolation of Molecular Biomarkers," ***Chemical Engineering Progress***, December 2012, 41-51, 2012. PMC 4286893, PMCI: PMC4286893, NIHSID:NIHMS462787
77. Chalmers, J.J. Magnetic, Batch Separation. *Methods Navigator, Cell Biology Protocols Module*, Edited by P. Michael Conn. Elsevier 2012.

78. Miller, B.L., Chalmers, J.J. Cell Enrichment from human blood through red cell lysis. ***Methods Navigator, Cell Biology Protocols Module***, Edited by P. Michael Conn. Elsevier. 2012.
79. Jie, Xu, Mahajan, K., Xue, W., Winter, J.O., Zborowski, M., Chalmers, J.J. Simultaneous, single particle, magnetization and size measurements of micron sized, magnetic particles, ***JMMM*** 324:4189-4199. 2012. PMID: 22962515; PMC3433070.
80. Garcia-Villa, A., Balasubramanian, P. Miller, B.L., Lustberg, M., Ramaswamy, B., Chalmers, J.J. Assessment of γ-H2AX levels in circulating tumor cells from patients receiving chemotherapy, ***Front. Oncol****. 2:128, 2012;* PMID. 23112954; PMC ID PMC3480704.
81. Jatana, K.R., Lang, J.C., Teknos, T.N., Chalmers, J.J. Circulating tumor cells and squamous cell carcinoma of the head and neck: What do we know and where do we go? In Press in *Cancer Treatments- Oncology*.
82. Jin, X., Abbot, S., Zhang, X., Kang, L., Voskinarian-Berse, V., Karmeneva, M.V., Moore, L.R., Chalmers, J.J., Zborowski, M., Erythrocyte enrichment in hematopoietic progenitor cell cultures based on magnetic susceptibility of the hemoglobin. ***PLoSONE***. Vol. 7, Issue 8:1-10, e39491, 2012; PMID: 22952572; PMCID: PMC3428333. 2012
83. Jin, X., Chalmers, J.J., Zborowski, M. Iron Transport in Cancer Cell Culture Suspensions measured by Cell magnetophoresis. *Analytical Chemistry*. 84:4520-4526, 2012; PMID 22500468;
84. Lustberg,, M., Jatana, KR, Zborowski, M., Chalmers, J.J. Emerging Technologies for CTC Detection Based on Depletion of Normal Cells. *Recent Results Cancer Res.* 195:97-110. 2012.
85. Jin, X., Yazer, M.H., Chalmers, J.J., Zborowski, M. Quantification of changes in oxygen release from red blood cells as a function of age based on magnetic susceptibility measurements. *The Analyst,* 136(14):2996-3003. 2011. PMID: 21463135;
86. Wu, Y. Chalmers JJ, Wyslouzil, B., Casnocha, S., McCormick, E., Ma, N. Growth and productivity of NS0 cells with cholesterol nanoparticle supplementation. *Biotechnol Progress.* 27(3):796-802. 2011. PMID: 21509955;
87. Sun, J., Zborowski, M., Chalmers, J. Quantification of both the presence, and oxidation state, of Manganese in *Bacillus atrophaeus* spores and its imparting of magnetic susceptibility to the spores. *Biotechnology and Bioengineering,* 108(5):1119-1120. 2011. PMID: 21449026; PMCID: PMC3431158
88. Jatana, KR, Lang, JC, Chalmers, JJ. Identification of circulating tumor cells: a prognostic maker in squamous cell carcinoma of the head and neck? *Future Oncol*. 7(4):481-4. 2011. PMID: 21463135; NIHMSID 647365;
89. Zborowski, M., Moore, L.R., Williams, P.S., Chalmers, J.J. Magnetic Pressure as a Scalar Representation of Field Effects in Magnetic Suspensions. AIP, 2011.
90. Hu, W., Gladue, R., Hansen, J., Wojnar, C., Chalmers, JJ. Scale-up of algae culture can be limited due to high oxygen demand: It was not shear sensitivity this time! *Biotechnol. Progress*. 26(1):79-87. 2010. PMID: 19847886
91. Henighan, T., Chen, A., Vieira, G., Hauser, A.J., Yang, F.Y., Chalmers, J.J., Sooryakumar, R. Transporting Biological Cells via Programmable Mobile Magnetic Traps. Biophys J.. 98(3):412-417. 2010. PMID: 20141754
92. Schneider, T., Karl, S., Moore, L.R., Chalmers, J.J., Williams, P.S., Zborowski, M. Sequential CD34 cell fractionation by magnetophoresis in a magnetic dipole flow sorter. *The Analyst* 135(1):62-70. 2010. PMID: 20024182
93. Chalmers, J,.J., Xiong, Y., Shao, M., Tong, X., Farag, S., Zborowski, M. Quantification of non-Specific Binding of Magnetic Nanoparticles: Implication for detection and magnetic cell separation. *Biotechnol and Bioeng*. 105(6):1078-1093. 2010. PMID: 20014141;
94. Wu, Y., Chalmers, J.J., Wyslouzil, B. The use of Electrohydrodynamic Spraying to Disperse Hydrophobic Compounds in Aqueous Media. *Aerosol Science*. 43(9):902-910. 2009.
95. Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K.R., Schuller, D., Agrawal, A., Zborowski, M., Chalmers, J.J. Confocal images of circulating tumor cells obtained using a methodology and technology that removes normal cells. *Molecular Pharmaceutics* 6(5):1402-1408, 2009. PMID: 19445481
96. Godoy-Silva, R., Chalmers, J.J., Casnocha, SA, Bass, L.A., Ma, N. Physiological Responses of CHO Cells to Repetitive Hydrodynamic Stress. *Biotechnol. Bioeng*. 103(6):1103-1117. 2009. PMID: 19405151
97. Shenkman, RM, Chalmers, J.J., Hering, BJ, Kirchhof, N., Papas, K. Quadrupole Magnetic Sorting (QMS) of Porcine Islets of Langerhans. *Tissue Engineering* Part C Methods. 15(2):147-56. 2009. PMID: 19505179
98. Shenkman, RM, Godoy-Silva, G., Papas, K., Chalmers, J.J. Effect of Energy Dissipation rate on Islets of Langerhans: Implications for Isolation and Transplantation. *Biotechnol and Bioeng*. 103:413-423. 2009. PMID: 19191351

99. Godoy-Silva, R., Mollet, M., Chalmers, J.J., Evaluation of the Effect of Chronic Hydrodynamic Stresses on Cultures of Suspended CHO-6E6 Cells, B*iotechnology and Bioengineering*. 102(4):1119-1130. 2009. PMID: 18958864
100. Jing, Y., Nal, Niladri, Williams, P.S., Mayorga, Maritza, Penn, Marc, Chalmers, J. J. Quantitative Intracellular Magnetic Nanoparticle Uptake Measured by Live Cell Magnetophoresis. *FASEB Journal.*22:4239-4247. 2008. PMID: 18725459
101. Jin, X., Zhao, Y., Richardson, A., Moore, L., Williams, S., Zborowski, M., Chalmers, J.J. Differences in magnetically induced motion of diamagnetic, paramagnetic, and superparamagnetic microparticles detected by cell tracking velocimetry. *The Analyst*. 133:1767-1775. 2008. PMID: 19082082
102. Farson, DF., Choi, HW, Zimmerman, B., Steach, JK, Chalmers, JJ, Olseik, SV, Lee, L.J. Femtosecond laser micromachining of dielectric materials for biomedical applications. *J. of Micromechanics and Microengineering*. 18(3):035020-035020. 2008.
103. Mollet, M., Godoy-Silva, R., Berdugo, C., Chalmers, J.J. Computer Simulations of the Energy Dissipation Rate in a Fluorescence Activated Cell Sorter: Implications to Cells. *Biotechnol. Bioeng*. 100:260-272. 2008. PMID: 18078288
104. Hu, W., Rathman, J.J., Chalmers, J.J. An Investigation of small molecule surfactants for alleviating bubble associated cell damage. *Biotechnol. Bioeng*. 101(1):119-127. 2008. PMID: 18646218
105. Hu, W., Gladue, R., Hansen, J., Wojnar, C., Chalmers, J.J. The Sensitivity of the Dinoflagellate *Crypthecodinium cohnii* to transient hydrodynamic forces. *Biotechnology Progress* 23:1355-1362. 2007.
106. Tong, X., Xiong, Y., Zborowski, M., Farag, S.S. Chalmers, JJ. A Novel High Throughput Immunomagnetic Cell Sorting System for Potential Clinical Scale Depletion of T Cells for Allogeneic Stem Cell Transplantation. *Experimental Hematology*. 35(10):1613-22. 2007. PMID: 17697744
107. Tong, X. ,Yang, L., Lang, J. Zborowski, M., Chalmers, J. Application of immunomagnetic cell enrichment in combination with RT-PCR for the detection of rare circulating head and neck tumor cells in human peripheral blood. Cytometry B Clin. Cytom. 72(5):310-323. 2007. PMID: 17205568
108. Mollet, M., Godoy-Silva, R. Chalmers, JJ. Acute Hydrodynamic Forces Induce Apoptosis: A Complex Question. *Biotechnology and Bioengineering* 98(4): 772-788. 2007. PMID: 17497730
109. Mehta, B., Holman, D., Chalmers, J.J., Grzybowsk, D. M. Characterization of arachnoidal cells cultured on three-dimensional non-woven PET matrix. *Tissue Engineering*. 13(6):1269-79. 2007.
110. Jing, Y., Moore, LR, Schneider, T., Williams, PS, Chalmers, JJ., Farag, SS, Bolwell, B., Zborowski, M. Negative Selection of Hematopoietic Progenitor Cells by Continuous Magnetophoresis. *Experimental Hematology*. 35(4):662-672. 2007. PMID: 17379076
111. Melnik, K., Sun, J., Fleischman, A., Roy, S., Zborowski, M., Chalmers, J.J. Quantification of the Magnetic Susceptibility in several strains of *Bacillus* spores: implications for detection and separation. *Biotechnology and Bioengineering*. 98:186-192. 2007.
112. Schneider T, Moore LR, Jing Y, Haam S, Williams PS, Fleischman AJ, Roy S, Chalmers JJ, Zborowski M., Continuous flow magnetic cell fractionation based on antigen expression level. J Biochem Biophys Methods. 68:1-21. 2006.
113. Lara, O., Tong, X., Zborowski, M., Farag, S., Chalmers, J.J. Comparison of two Immmunomagnetic Separation Methodologies to Deplete T-cells from human blood samples. *Biotechnology and Bioengineering.*Vol. 94 (1): 66-80. 2006. PMID: 16518837
114. Zhang H. Williams PS, Zborowski M, Chalmers JJ. Reduction of binding affinities/avidities of Antibody-Antigen and Strepaddvidin-biotin: Quantification and Scale-up implications. Biotechnol. Bioeng. 95:812-829. 2006.
115. Leigh, D.R., Steinert, S., Moore, L., Chalmers, J.J., Zborowski, M., Cell Tracking Velocimetry as a Tool for Defining Saturation Binding of Magnetically Conjugated Antibodies. *Cytometry* A. Cytometry A. 66(2):103-8. 2005
116. Carpino, F., Moore, L.R., Zborowski, M., Chalmers, J.J., Williams, P.S., Analysis of magnetic nanoparticles using quadrupole magnetic field-flow fractionation. *Journal of Magnetism and Magnetic Materials* 293:546-552. 2005.
117. Carpino F, Moore LR, Chalmers JJ, Zborowski M, Williams PS. Quadrupole magnetic field-flow fractionation for the analysis of magnetic nanoparticles. *ICFPM Proceedings in Journal of Physics: Conference Series* 2005.
118. Zhang, H, Zborowski, M., Williams, P S., Chalmers, J. Establishment and implications of a characterization method for magnetic nanoparticles using Cell Tracking Velocimetry and magnetic susceptibility modified solutions. *Analyst*, 130:514 – 527. 2005. PMID: 15776162

119. Moore, L.R., Milliron, L., Williams, P.S., Chalmers, J.J., Margel, S., Zborowski, M., Control of magnetophoretic mobility by susceptibility-modified solutions as evaluated by cell tracking velocimetry and continuous magnetic sorting. *Analytical Chem*. 76:3899-3907. 2004
120. Ma, N., Chalmers, J.J., Aunins, J.G., Zhou, W., Xie, L Quantitative Studies of Cell Damage in Sparged Bioreactors Using A Bubble Collector to Segregate Bubble Rupture Events, *Biotechnology Progress* 20(4):1183 – 1191. 2004. PMID: 15296446
121. Fife, J.P., Derksen, R.C., Ozkan, H.E., Grewal, P.S., Chalmers, J.J. Evaluation of a Contraction Flow Field on Hydrodynamic Damage to Entompathogenic Nematodes- a Biological Pest Control Agent. *Biotechnology and Bioengineering* 86(1):11:96-107. 2004.
122. Williams, S., Decker, K., Nakamura, M., Chalmers, J.J., Moore, L., Zborowski, M. Splitter Imperfections in Annular Split-Flow Thin Separation Channels: Experimental Study of Nonspecific Crossover. *Analytical Chemistry,* 75(23):6687-6695. 2003.
123. Williams, S., Moore, L.R., Chalmers, J.J., Zborowski, M. Splitter Imperfections in Annular Split-Flow Thin Channel Separations of Cells: Effect of Non-Specific Crossover. *Analytical Chemistry* 75(6):1365-1373. 2003.
124. McCloskey, K. Moore, L., Hoyos, M., Rodrigues, A., Chalmers, J.J., Zborowski, M. Magnetic cell separation is a function of antibody binding capacity (ABC). *Biotechnology Progress* 19(3):899-907. 2003. PMID: 12790655.
125. Chosy, J., Melnik, K., Comella, K., Zborowski, M., Chalmers, J.J. Characterization of Antibody Binding to Three Cancer-Related Antigens Using Flow Cytometry and Cell Tracking Velocimetry. *Biotechnology and Bioengineering* 82:340-351. 2003.
126. Zborowski, M., Moore, L.R., Williams, S. Chalmers, J.J. Separations based on magnetophoretic mobility, *Separation Sciences and Technology,* 37: 3611-3633. 2002.
127. Hoyos, M., McCloskey, K., Moore, L., Nakamura, M., Bolwell, B., Chalmers, J., Zborowski, M. Pulse-injection studies of blood progenitor cells in a quadrupole magnetic flow sorter. *J. Separation Science and Technology* 37(4) 1-23. 2002.
128. Comella, K., Melnik, K., Chosy, J., Zborowski, M., Cooper, M.A., Fehniger, T.A. Caligiuri, M.A., and Chalmers, J.J. The effect of antibody concentration on the separation of human natural killer cells in a commercial immuno-magnetic separation system. *Cytometry* 45:285-293. 2001.
129. Melnik, K. Nakamura, M., Comella, K., Zborowski, M., Chalmers, J.J. Evaluation of eluants from batch separations of CD34(+) cells from human cord blood using a commercial, immunomagnetic cell separation system. *Biotechnol Progress* 17(5):907-916. 2001.
130. McCloskey, K., Comella, K., Margel, S., Chalmers, J., Zborowski, M. Mobility measurements of immunomagnetically labeled cells allow quantitation of secondary antibody binding amplification. *Biotechnol. Bioeng.* 75:642-655. 2001. PMID: 11378865.
131. Nakamura, M., Decker, K., Chosy, J., Comella, K., Melnik, K. Moore, L., Zborowski, M., Chalmers, J.J. Separation of Breast Cancer Cells by Quadrupole Magnetic Flow Sorter, *Biotechnology.Progress* 17:1145-1155. 2001. PMID: 11735453
132. McCloskey, K., Chalmers, J.J., Zborowski, M., Measurement of CD2 Expression Levels of IFN-∀ Treated Fibrosarcomas Using Cell Tracking Velocimetry, *Cytometry*. Jun 1;44(2):137-47. 2001. PMID: 11378865.
133. Moore, L.R., Rodrigues, A.R., Williams, P.S., McCloskey, K., Bolwell, B.J., Nakamura, M., Chalmers, J.J., Zborowski, M. Progenitor cell isolation with a high-capacity quadrupole magnetic flow sorter. *J. Magn. Magn. Mater.* 225(1-2):277-284. 2001
134. Nakamura, N., Lasky, L., Zborowski, M., Chalmers, J.J. Theoretical and Experimental Analysis of the Accuracy of Cell Tracking Velocimetry, *Experiments in Fluids* 30:371-380. 2001.
135. Hoyos, M., Moore, L.R., McCloskey, K.E., Margel S., Zuberi, M., Chalmers, J.J., Zborowski, M. Study of magnetic particles pulsed-injected into an annular SPLITT-like channel inside a quadrupole magnetic field, *J. Chromatogr*., A , 903(1-2):99-116. 2000. PMID: 1153960.
136. Moore, L.R. Sun, L.P., Zborowski, M., Nakamura, M., Chalmers, J.J., McCloskey, K. Gura, S., Burdygin, I., Margel, S. The use of Magnetite-Doped Polymeric Microspheres in Calibrating Cell Tracking Velocimetry, *J. Biochemical and Biophysical Methods* 44:115-130, 2000.
137. McCloskey, K. E., Zborowski, M., Chalmers, J.J. Magnetophoretic Mobilities Correlate to Antibody Binding Capacity, *Cytometry* 40:307-315. (2000). Erata, *Cytometry* 41: (2)150-150, OCT 1 2000. PMID: 10918281.
138. Bauer, T., Hancock, L., Rathman, J., Chalmers, J.J., Cell-Microcarrier adhesion to Gas-Liquid Interfaces and Foam, *Biotechnology Progress 16:125-132,* 2000.
139. Williams, P.S., Zborowski, M., Chalmers, J.J. Flow Rate for the Quadrupole Magnetic Cell Sorter. *Analytical Chemistry 71:3799-3807,* 1999.

140. Chalmers, J.J., Haam, S., Zhou, Y., McCloskey, K., Moore, L., Zborowski, M., Williams, P.S. Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Cellular Hydrodynamic Diameter, *Biotechnology and Bioengineering* 64:509-518, 1999.
141. Chalmers, J.J., Haam, S., Zhou, Y., McCloskey, K., Moore, L., Zborowski, M., Williams, P.S. Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Magnetic Susceptibility, *Biotechnology and Bioengineering* 64:519-526, 1999.
142. Zborowski, M., Sun, L., Moore, L.R., Chalmers, J.J. Rapid cell isolation by magnetic flow sorting for applications in tissue engineering, *ASIO Journal* 45:127-130, 1999.
143. Moore, L.R., Zborowski, M., Sun, L. Chalmers, J.J. Lymphocyte fractionation using immunomagnetic colloid and dipole magnet flow cell sorter, *J. Biochemical and Biophysical Methods* 37:11-33, 1998.
144. Chalmers, J.J., Gas Bubbles and their Influence on Microorganisms, *Applied Mechanics Reviews*, Vol. 51: 113-121, 1998.
145. Wheeler, G., Chalmers, J.J., Tomasko, D., A Linked Supercritical Extraction-Biodegradation System to Extract and Degrade Phenol, *Chemical Engineering Science*. 53:189-201, 1998.
146. Chalmers, J.J, Mandal, S., Fang, B., Sun, L., Zborowski, M., Theoretical Analysis of Cell Separation Based on Cell Surface Marker Density, *Biotechnology and Bioengineering* 59:10-20 (1998).
147. Sun, L., Zborowski, M., Moore, L., Chalmers, J.J., Continuous, Flow-Through Immunomagnetic Cell Separation in a Quadrupole Field. Cytometry. 33:469-475. 1998.
148. Vir, R., Chalmers, J.J., A Confocal Microscopic Observation of Non-Submerged Biofilms, *Biotechnology Progress*. 13:727-732, 1997.
149. Zborowski, M., Williams, P.S., Sun. L., Moore, L.R., Chalmers, J.J., Cylindrical Split and Quadrupole Magnetic Field in Applications to Continuous-Flow Magnetic Cell Sorting, *J. Liquid Chromatography and Related Techniques*.20:2887-2905, 1997.
150. Chalmers, Jeffrey J.J., Shear sensitivity of insect cells, *Cytotechnology*.20:163-171, 1996.
151. Tseng, D.Y., Vir, R., Traina, S.J., Chalmers, J.J., A Fourier-Transform Infrared Spectroscopic Analysis of Organic Matter Degradation in a Bench-Scale Solid Substrate Fermentation (Composting) System", Biotechnology and Bioengineering. 52:661-671. (1996).
152. Tseng, D.Y., Tuovinen, O.H., and Chalmers, J.J. ATP measurements in Compost, *Compost Science and Utilization,* 4:6-17, 1996.
153. Zborowski, M., Fuh, C.B., Green, R., Baldwin, N.J., Reddy, S., Douglas, T., Mann, S., Chalmers, J.J., Immunomagnetic Isolation of Magnetoferritin-Labeled Cells in a Modified Ferrograph, *Cytometry* 24:251-259, 1996.
154. Venkat, R., Stock, R., Chalmers, J.J. Study of Hydrodynamics in Microcarrier Culture Spinner Vessels: A Particle Tracking Velocimetry Approach, *Biotechnology and Bioengineering* 49:456-466, 1996.
155. Reddy, S., Moore, L., Zborowski, M., Chalmers, J.J., Determination of the Magnetic Susceptibility of Labeled Particles by Video Imaging, *Chemical Engineering Science* 51:947-956, 1996.
156. Venkat, R.V., Chalmers, J.J., Characterization of agitation environments in 250 ml spinner vessel, 3 L, and 20 L reactor vessel used for animal cell microcarrier culture. *Cytotechnology.* 22:95-102, 1996.
157. Tseng, D.Y., Tuovinen, O.H., Hoitink, H.A. J., Chalmers, J.J. Characterization of a Bench-Scale System for Studying the Biodegradation of Organic Solid Wastes, *Biotechnology Progress*, 11:443-451, 1995.
158. Chattopadhyay, D., Rathman, J., Chalmers, J.J., A Thermodynamic Explanation for Cell Adhesion to Gas-Liquid Interfaces, *Biotechnology and Bioengineering*, 48:649-658, 1995.
159. Chattopadhyay, D., Rathman, J., Chalmers, J.J., The Protective Effect of Specific Medium Additives with Respect to Bubble Rupture, *Biotechnology and Bioengineering*. 45:473-480, 1995.
160. Garcia-Briones, M.A., Brodkey, R.S., Chalmers, J.J., Computer Simulations of the Rupture of a Gas Bubble at a Gas-Liquid Interface and its Implications in Animal Cell Damage, *Chemical Engineering Science,* 49:2301-2320, 1994.
161. Chalmers, J.J., Cells and Bubbles in Sparged Bioreactors, *Cytotechnology*, 15:311-320, 1994.
162. Garcia-Briones, M.A, Chalmers, J.J., Flow Parameters Associated with Hydrodynamic Cell Injury, *Biotechnology and Bioengineering*, 44:1089-1098, 1994.
163. Trinh, K., Garcia-Briones, M., Hink, F., Chalmers, J.J. Quantification of Suspended Cell Damage as a Result of Bubble Rupture, *Biotechnology and Bioengineering*. 43:37-45, 1994.
164. Garcia-Briones, M.A., Chalmers, J.J., Cell-Bubble Interactions: Mechanisms of Suspended Cell Damage, *Annals of the New York Academy of Sciences*, 665:219-229, 1992.
165. Kleman, G., Chalmers, J.J., Strohl, W., Glucose-stat: A Predictive and Feedback Controlled Continuous Culture, *Applied and Environmental Microbiology*, 57:918-923, 1991.

166. Kleman, G., Chalmers, J.J., Strohl, W. Predictive and Feedback Control Provides Constant Glucose Concentration in Fed-batch Fermentations, Applied and Environmental Microbiology, 57:910-917, 1991.
167. Goldblum, S.D., Bae, Y.K., Hink, W., Chalmers, J.J., The Protective Effect of Methylcellulose on Suspended Insect Cells Subjected to Laminar Shear Stress, *Biotechnology Progress*, 6:383-390, 1990.
168. Chalmers, J.J., Kim, E., Telford, J.N., Shuler, M.L., Wilson, D.B., Effects of Temperature on the Stability of Escherichia coli Overproducing β-lactamase or Human Epidermal Growth Factor, Applied and Environmental Microbiology, 56:104-111, 1990.
169. Chalmers, J.J., Shuler, M.L., Wilson, D.B., A Simple Membrane Reactor to Obtain High Cell Density and Plasmid Encoded Protein Production from *Escherichia coli*, *Biotechnology Techniques*, 4:73-78, 1990.
170. Georgiou, G., Chalmers, J.J., Shuler, M.L., Wilson, D.B., Continuous Immobilized Recombinant Protein Production from *E. coli* Capable of Selective Protein Excretion: A Feasibility Study, *Biotechnology Progress*, 1:75-79, 1985.
171. Arnold, F.H., Chalmers, J.J., Saunders, M.S., Croughan, M.S., Blanch, H.W., Wilke, C.R., A Rational Approach to the Scale-up of Affinity Chromatography", A.C.S. Symposium Series 271, p. 113 (1985).

BOOKS

Zborowski, M. and Chalmers, J. J. **Magnetic Cell Separation,** Vol. 32 of Series: **Laboratory Techniques in Biochemistry and Molecular Biology,** Elsevier, Amsterdam, 2007.

CHAPTERS IN BOOKS

1. Gomez-Pastora, J., Wu, X., Chalmers, J.J. Magnetic Separation of Micro-and Nanoparticles for Water Treatment Processes. Chapter 10, In: Solid-Liquid Separation Technologies: Applications for Produced Water. Ed. O.I. Ogunsola, I.K. Gamwo, CRC Press. 2022.
2. Frank, G., Chalmers, J.J. Harrison, R., G., Todd, P.W., Rudge, S.R., Petrides, D.P, Pepper, C., Downey, B., Breit, J, Betenbaugh, M.J., Calzadilla, N., Section 20, **Bioreactions and Bioprocessing, Perry's Handbook**, McGrawHill, 2018.
3. Miller, B.L., Lustberg, M.B., Summers, T.A. Chalmers, J.J.,.. Multispectral Imaging Analysis of Circulating Tumor Cells in Negatively Enriched Peripheral Blood Samples. Methods Mol. Biol. 1634:219-234. 2017.
4. Zborowski, M., Chalmers, J.J., **Magnetic Cell Manipulation and Sorting, Microtechnology for Cell Manipulation and Sorting**. W.Lee, P. Tseng, D. DiCarlo, eds. Springer 2017
5. Jeffrey J. Chalmers, Maryam B. Lustberg, Clayton Deighan, Kyoung-Joo Jenny Park, Yongqi Wu, Peter Amaya, Depletion of normal cells for CTC enrichment, **Circulating Tumor Cells: Isolation and Analysis**. John Wiley & Sons, 2016.
6. Zborowski, M., Chalmers, J.J., Magnetophoresis: Fundamentals and Applications. **Wiley Encyclopedia of Electrical and Electronics Engineering**. John Wiley & Sons, 2015.
7. Chalmers, J. J, Ma, N., Hydrodynamic Damage to Animal Cells, **Cell Engineering, Animal Cell Culture**, Vol 9:169-183. 2014.
8. Lustberg, M., Jatana, K., Zborowski, M., Chalmers, J.J. Emerging Technologies for CTC detection Based on Depletion of Normal Cells. In**: Minimal Residual Disease and Circulating Tumor Cells in Breast Cancer,** Ed: K. Pantel, C. Sotiriou, M. Ignatiadis, Springer-Vertag GmbH, Berlin. 2012.
9. Godoy-Silva, R., Berdogo, C., Chalmers, J.J. Aeration, Mixing, and Hydrodynamics in Bioreactors. In: Wiley **Encyclopedia of Industrial Biotechnology**, 2010.
10. Xiong, Y. Shao, M., Zborowski, M., Chalmers, J.J. Magnetic cell separation to enrich for rare cells. In: **Methods in Bioengineering (MIB)**, Vol. Editor K. Rege, Series editors: Yarmush, M and Langer, R.S. Artech House. 2009.
11. Ma, Ningning, Mollet, M., Chalmers, J.J. Aeration, Mixing, and Hydrodynamics in Bioreactors. In: **Cell Culture Technology for Pharmaceutical and Cellular Therapies**. CRC Press, Taylor and Francis Group, Boca Raton, FL. 2006, Pp. 275-304.
12. Lara, O. Chalmers, J.J. Cell enrichment and immunochemical staining. In: **Immunochemical Protocols**, **Methods in Mol. Biol**. Humana Press; Vol 295:301-10. 2005. PMID: 15596905.
13. Zborowski, M., Chalmers, J.J. Magnetic Cell Sorting, In: **Immunochemical Protocols**, **Methods in Mol. Biol**. Humana Press; Vol 295:301-10. 2005.
14. Zborowski, M., Williams, S, Chalmers, J.J., Magnetic FFF, **Encyclopedia of Chromatography**, Marcel Dekker, Inc. New York, 2001. Pp.503-507.
15. Chalmers, J.J. Animal Cell Culture, Effects of Agitation and Aeration on Cell Adaptation, In: **Encyclopedia of Cell Technology**, R. Spier, J.B. Griffiths, A. H. Scragg, eds. 2000, Wiley, New York. Pp. 41-51.

16. Zborowski, M., Moore, L.R., Sun, L., Chalmers, J.J., Continuous-flow Magnetic Cell Sorting Using Soluble Immunomagnetic Labels, In: **Scientific and Clinical Applications of Magnetic Carriers**, W. Schuett, U. Hafeli, J. Teller, M.Zborowski eds. (1997), Plenum Press.
17. Chattopadyay, D., M. Garcia-Briones, R. Venkat, Chalmers, J.J., Hydrodynamic Properties in Bioreactors, In: **Mammalian Cell Biotechnology in Protein Production,** Hansjorg Hauser, Roland Wagner, (1997) ed., Walter de Gruyter, Publishers, Berlin.
18. Chalmers, J.J., Shear Sensitivity of Insect Cells, In: **Insect Cell Cultures: Fundamental and Applied Aspects**, Just Vlak, et al. (eds). (1996) Kluwer Academic Publishers.
19. Chalmers, J. J., The Effect of Hydrodynamic Forces on Insect Cells, In: **Insect Cell Culture: Production of Improved Biopesticides and Proteins From Recombinant DNA**, Michael Shuler (1995), ed. Hanser Publishers, New York.
20. Shuler, M.L., Kim, B.G., Chalmers, J.J., Kim, E., Wilson, D.B. On Bioprocess Considerations and the Use of Genetically Modified *Escherichia coli*- systems for excretion of plasmic-encoded proteins, In: **Bioprocess Engineering: 1st Generation**, Trarum Ghose (1989), ed., Ellis Horwood Limited.

PUBLISHED PROCEEDINGS

1. Zborowski, M., Moore, L.R., Reddy, S., Chen, G.H., Sun, L., Chalmers, J. Magnetic Flow Sorting Using a Model System of Human Lymphocytes and a colloidal magnetic label, **ASAIO J.** 42:M666-M671, 1996.
2. Chalmers, J.J., Garcia-Briones, M., Bavarian, F., Hink, F. Insect Cell Interactions with Gas Bubbles, **Baculoviruses and Recombinant Protein Production Processes Workshop**, Interlaken, Switzerland, March 29-April 1, 1992.

REFEREED PROCEEDINGS

1. Carpino, F., L. R. Moore, J.J. Chalmers, M. Zborowski, P. S. Williams, Quadrupole magnetic field-flow fractionation for the analysis of magnetic nanoparticles, Submitted to: Journal of Physics: Conference Proceedings (International Conference on Fine Particle Magnetism, London, UK, 2004).
2. Moore, L.R., Zborowski, M., Sun, Liping, Chalmers, J.J., Lymphocyte Fractionation in a Magnetic Flow Cell Sorter. **Molecular Biology of Hematophoiesis 6**, June 25-29, 1998, (published 1999) Kluwer Academic, p.217-227.
3. Garcia-Briones, M.A., Chalmers, J.J. Analysis of Hydrodynamic Information Obtained from Computer Simulations of the Rupture of a Gas Bubble in Relation to Animal Cell Damage in Sparged Bioreactors, **3rd International Conference on Bioreactor & Bioprocess Fluid Dynamics**, Robinson College, Cambridge UK, Sept. 14-16, 1993.
4. Venkat, R.V., Brodkey, R.S., Guezennec, Y.G., Chalmers, J.J., Experimental determination of local hydrodynamic information in microcarrier culture spinner flasks, **3rd International Conference on Bioreactor & Bioprocess Fluid Dynamics**, Robinson College, Cambridge UK, Sept. 14-16, 1993.

PRESS STORIES

1. Ohio State Researchers Use Joystick for Biomedical Advances. http://www.foxnews.com/story/0,2933,552917,00.html
2. Ohio state researchers fueling Ohio's economy http://www.ohiostatealumni.org/newscenter/economic_force.php
3. Genetic Engineering News Webnair (February 23, 2016)

INVITED WORKSHOPS

1. "Impact of stress typical of large scale systems on stem cells "Translating Cell Therapies from Lab Bench to Clinic: Manufacturing and Product Characterization. ECI Workshop, Sunday, 14th January, 2017. San Diego, CA
2. Translating Cell Therapies from Lab Bench to Clinic: Manufacturing and Product Characterization. ECI Workshop, Sunday, 18th January, 2015. San Diego, CA
3. Enhancement of Chemical Engineering Curricula with Biological Applications in Fluid Transport. NSF **CCLI Project,** August 6-8, 2009.
4. **Eighth Annual Symposium on Frontiers of Engineering**. National Academy of Engineering, Sept. 19-21, 2002 Irvine, Ca.
5. **Challenges for the Chemical Sciences in the 21st Century, Workshop on Homeland Defense & National Security**, National Academy of Engineering, Jan. 14-16, 2002, Irvine, CA
6. **Challenges for the Chemical Sciences in the 21st Century, Workshop on Health and Medicine**, National Academy of Engineering, December 2-4, 2002, Irvine, CA

INVITED PRESENTATIONS

1. Chalmers, J.J., The separation of red blood cells based solely on intrinsic magnetization: clinical and commercial implications. **Biochemical and Molecular Engineering XXI**, Mont Tremblant, Quebec, Canada July 14-18, 2019,
2. Chalmers, J.J., The separation of red blood cells based solely on intrinsic magnetization: clinical and commercial implications. **AABB**, San Antonio, TX, Oct. 19-21, 2019.
3. Chalmers, J.J. What comes around, goes around. or, I are a gear-head engineer ad proud of it! **Cell Culture Engineering XVI**, Palm Springs, May 8-13, 2016.
4. Chalmers, J.J. Separation/Isolation of cells, from fundamentals to specific research/production and clinical applications. **U. of Minnesota**, March 2, 2016
5. Chalmers, J.J. Separation/Isolation of cells, from fundamentals to specific research/production and clinical applications. **Georgia Tech**, December 8, 2015.
6. Chalmers, J.J. Exploitation of Magnetic Nanoparticles in Cell Analysis and Separation: Theoretical, Experimental, and Clinical Considerations. **Stanford University**, January 8, 2015.
7. Chalmers, J.J. Multiparameter analysis of HPV positive oropharyngeal CTCs reveals late HPV viral gene expression consistent with and active viral life cycle, **Advances in Circulating Tumor Cells (ACTC) from Basic Research to Clinical Practice.** Oct. 8-11, 2014. Crete, Greece.
8. Chalmers, J.J. Characterization of non-traditional CTCs in metastatic breast cancer linked to overall survival. **Gordon Research Conference**, Mt Holyoke College, August 3-8, 2014.
9. Chalmers, J.J., Jatana, K. Going beyond enumeration: Characterization of CTCs and cancer associated cells in *breast* and head and neck squamous cell carcinoma. **9th International Symposium on Minimal Residual Cancer**. Sept. 24-17, 2013. Pullman Paris Bercy, France.
10. Chalmers, J.J. Expanding the Definition of Traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **PittCon**, March 19, 2013. Pittsburgh, PA.
11. Chalmers, J.J. Expanding the Definition of Traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **Molecular Med TRI-CON 2013**. February 11-15, 2013, San Francisco, CA
12. Chalmers, J.J. Expanding the Definition of Traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **Cell Tech: Circulating Tumor Cells**, .January 22-23, 2013.
13. Chalmers, J.J. Separation/Isolation of rare cells, including circulating tumor cells, in patient blood: It is not the same as spiking cancer cells into normal blood! **University of Michigan**, December 4, 2012.
14. Chalmers, J.J. Mammalian Cell Fluid Mechanics and Scale-Up Considerations, **Millipore Corp**. November 13, 2012. Bedford, MA.
15. Chalmers, J.J. Expanding the Definition of Traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **World CTC Conference**, November 12-14, 2012. Boston, MA.
16. Chalmers, J.J. Expanding the Definition of Traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **ADAPT 2012**, Sept 19-21, Washington, D.C.
17. Jatana, K, Chalmers, J.J. Identification, characterization, and clinical correlation of circulating tumor cells in patients with squamous cell carcinoma of the head and neck using a negative enrichment technology" Advances in **Circulating Tumor Cells (ACTC) from Basic Research to Clinical Practice**, September 26-29, 2012. Athens-Greece.
18. Chalmers, JJ, Mammalian Cell Fluid Mechanics and Scale-Up Considerations. **The Bioprocessing Summit**, CHI, Boston, MA August 20-23, 2012.
19. Berdugo, C., Velasco, O.L., Chalmers, J.J. Effect of Hydrodynamic Conditions on Expression of Stress Proteins, Cell Cycle, and Recombinant Protein Productivity. **Cell Culture Engineering XIII.** Scottsdale, AZ, April, 2012.
20. Chalmers, J.J. Expanding the Definition of Traditional circulating tumor cells (CTCs): Cells Associated with Cancer in the Blood of Patients with Solid Tumors. **Circulating Tumor Cells**, February, 2012. San Diego, CA.
21. Moore, R., Lo, V., Sivalenka, R., Guo, X., Khandker, L., Voskinarian-Berse, V., Kang, L., Zhang, X., Berstein, I., Miller, R., Kameneva, M., Yazer, M., Moore, L., Zborowski, M., Chalmers, J.J. Glen, K., Thomas, R., Stacey, A., Wylde, A., Owen, S., Abbot, S. Single Use Bioreactor System for Large Scale Production of Erythrocytes from Human Cord Blood Derived Hematopoietic Stem Cells. **Engineering Foundation Conference: Cell Based Therapies 2012**, Jan. 2012
22. Chalmers, J.J. Expanding the Definition of Traditional circulating tumor cells (CTCs): Cells Associated With Cancer in the Blood of Patients with Solid Tumors**. University of Kentucky, December, 2011**.
23. Chalmers, J.J. Expanding the Definition of Traditional circulating tumor cells (CTCs): Cells Associated With Cancer in the Blood of Patients with Solid Tumors**. Cornell University, November, 2011**.

24. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. . Expanding the definition of traditional CTCs: Cells Associated with Cancer in the Blood of Patients with Solid Tumors **ADAPT 2011. Cambridge Healthtech Institute's** Philadelphia, PA, September, 2011.
25. Chalmers, JJ. Separating Magnetically labeled and Unlabeled Biological Cells within microfluidic channels using magnetic traps created with nanowires and disks. **Biochemical and Molecular Engineering XVII: Emerging Frontiers.** Seattle, WA, June 26-30, 2011.
26. Chalmers, J. Process Scale-up Considerations for Therapeutic Antibody Production. **Centocor R&D**, King of Prussia, PA, April 5, 2011..
27. Chalmers, J. Expanding the definition of traditional CTCs: Detection and characterization of cells associated with cancer in the blood of patients with solid tumors. **Lorentz Center workshop: Circulating tumor cell isolation and diagnostics**. University of Leiden, Leiden, The Netherlands. February 7-11, 2011.
28. Chalmers, J.J. Multparameter Analysis of potential CTC's. **World Circulating Tumor Cell Summit**, November 29-Decmeber 1, 2010. Boston, MA
29. Chalmers, J. Process Scale-up Considerations for Therapeutic Antibody Production. **Beijing International Healthcare Industry Forum**, October, 2010, Beijing, China.
30. Chalmers, J. Overview of Posters, **2010 ASCO-NCI-EORTC**Annual Meeting on Molecular Markers in Cancer, Hollywood, Fl. Oct 18-20, 2010.
31. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. ADAPT 2010. Cambridge Healthtech Institute's Washington D.C., September, 2010.
32. Chalmers, J.J. Circulating Tumor Cells: Clinical Potential and Bioprocess considerations to develop a commercially viable process. **University of Oklahoma**, May 5, 2010.
33. Chalmers, J.J. Blood Pharming: Infinite Supply of fresh RBCs? **Cell Culture Engineering XII**, April 25-30, 2010. Bamif, CA.
34. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. Genitourinary Oncology Service, Memorial Sloan-Kettering Cancer Center. March 13, 2010.
35. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. Biomarker Assay Development Conference, Cambridge Healthtech Institute's San Diego, CA, Jan 25-27, 2010.
36. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. Circulating Tumor Cells: Emerging Technologies for Detection, Diagnosis, Prognosis, and Treatment. Sept 10-11, 2009. NCI workshop, NCI campus.
37. Chalmers, J.J., Balasubramanian, P., Yang, L., Lang, J.C., Jatana, K., Schuller, D., Agrawal, A., Teknos, T., Lustberg, M., Shapiro, C., Zborowski, M. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. Cambridge Healthtech Institute's ADAPT 2009, September 22-25, 2009. Washington DC.
38. Zborowski, M., Moore, L.R., Joshi, P., Jacobs, B., Boren, E., Chalmers, J.J. Magnetic separation methods for detection and analysis of circulating tumor cells. **Enrichment of CTCs in clinical samples using purely negative selection: Current status and potential**. Circulating Tumor Cells: Emerging Technologies for Detection, Diagnosis, Prognosis, and Treatment. Sept 10-11, 2009. **NCI workshop**, NCI campus
39. Chalmers, JJ, Yang, L., Lang, J.C., Balasubramanian, P., Jatana, K., Schuller, D., Agrawal, A., Zborowski, M., The Use of Magnetic Nanoparticles to Enrich for Rare, Circulating Tumor Cells in Head and Neck Cancer. **Nanomedicine Summit 08**, Cleveland, Oh. , Sept. 25-26, 2008.
40. Ma, Ningning, Godoy-Silva, R., Casnocha, S., Chalmers, J.J. Physiological Response of CHO Cells to repetitive hydrodynamic stress. **Cell Culture Engineering XI**, 2008, Sunshine Coast, Queensland, Australia.
41. Chalmers, J.J., The Use of Energy Dissipation Rate as a Parameter to assist in the evaluation, scale-up, and scale-down of Bioprocesses. **Genzyme**, Framingham, MA February 26, 2008.
42. Chalmers, J.J., Zborowski, M., Immunomagnetic Cell Separation: Fundamentals, Current Issues, and Future Potentials. **AICHE Annual Meeting**, Salt Lake city, Utah, November 5-9, 2007.
43. Chalmers, J.J., Mammalian Cell Fluid Mechanics and Scale-up Considerations Application and Design of Bioprocessing Equipment**, Society of Bioprocessing Professionals 2006 Bioprocessing Institute,** May 8-12, 2007, Philadelphia, PA

44. Chalmers, J.J., The Use of Energy Dissipation Rate as a Parameter to assist in the evaluation, scale-up, and scale-down of Bioprocesses. **AMGEN**, Thousand Oaks, CA, Sept 9, 2006.
45. Chalmers, J.J., Mammalian Cell Fluid Mechanics and Scale-up Considerations Application and Design of Bioprocessing Equipment**, Society of Bioprocessing Professionals 2006 Bioprocessing Institute,** May 8-12, 2006, Seattle, WA.
46. Chalmers, J.J., The Use of Energy Dissipation Rate as a Parameter to assist in the evaluation, scale-up, and scale-down of Bioprocesses. **Cell Culture Engineering X**, 2006. Whistler, BC Canada.
47. Chalmers, J.J. Relationship of Hydrodynamic Forces to Suspended Cells and Application of Magnetic Cell Separation Technology. **Pfizer**, St. Louis MI, Dec. 4-5, 2005.
48. Chalmers, J.J. and Zborowski, M., Quantification of the field interaction parameter and the binding constants of several antibody-magnetic nanoparticle conjugates, **Pacific Polymer Federation IX Conference**, December 13, 2005, Maui , Hawaii.
49. Chalmers, J.J. Magnetic Cell Separation: Biomedical, Bioprocess, or Biochemical? Its all Chemical Engineering to me!, **Department of Chemical Engineering, U. Mass Amherst**, December 1, 2005.
50. Chalmers, J.J. Magnetic Cell Separation: Biomedical, Bioprocess, or Biochemical? Its all Chemical Engineering to me!, 15C Plenary Lecture**, AIChE meeting**, Nov 2, 2005.
51. Chalmers, J.J. Exploitation of Magnetic Nano-particles in Cell Analysis and Separation: Theoretical, Experimental and Clinical Considerations, **UMBC**, September 26, 2005.
52. Chalmers, J.J. Mammalian Cell Culture Fluid Mechanics: Scale-up Considerations**. Society for Industrial Microbiology** annual meeting, Chicago, IL, August 21-25, 2005.
53. Chalmers, J.J., Exploitation of Magnetic Nano-particles in Cell Analysis and Separation: Theoretical, Experimental and Clinical Considerations**. Department of Material Science, Stanford University**, May 23, 2005.
54. Chalmers. J.J. Quantification of the field interaction parameter and the binding constants of several antibody-magnetic nanoparticle conjugates. ACS Symposium **79th ACS Colloid and Surface Science Symposium,** Clarkson University, June 12-15, 2005.
55. Chalmers, J.J. Quantification of the field interaction parameter and the binding constants of several antibody-magnetic nanoparticle conjugates. **3rd International Meeting on the Diagnostic and Biotechnology Applications of SuperParaMagnetic Microspheres**, San Diego, CA, June 16-17, 2005.
56. Chalmers, J.J. Scale-up of Animal Cell Bioprocesses Equipment: Overview and Current Unknowns**, Pfizer, St. Louis, Mo,** October 5, 2004.
57. Chalmers, J.J. Scale-up of Animal Cell Bioprocesses Equipment: Overview and Current Unknowns, **Martek Biotechnology**, Lexington, KY, July, 2004.
58. Chalmers, J.J. Mammalian Cell Fluid Mechanics and Scale-up Considerations. **Society of Bioprocessing Professionals 2004 Bioprocessing Institute**. Cambridge MA Sept 20-24, 2004.
59. Chalmers, J.J., Shear Sensitivity: What's all the Fuss? **Eli Lilly and Company**, Indianapolis, IN, April 8, 2004.
60. Chalmers, J.J., Exploitation of Magnetic Nano-particles in Cell Analysis and Separation: Theoretical, Experimental and Clinical Considerations, **RPI**, February 11, 2004.
61. Chalmers, J.J., Exploitation of Magnetic Nano-particles in Cell Analysis and Separation: Theoretical, Experimental and Clinical Considerations, **FABE**, Ohio State U., January 16, 2004.
62. Chalmers, J.J. Mammalian Cell Fluids Mechanics and Scale-up Considerations. **SBP Institute**, Washington, D.C. September 8-11, 2003.
63. Chalmers, J.J., Scale-up of Mammalian Cell Bioreactor and Bioprocess Equipment, **Wythe Pharmaceuticals**, Andover, MA. May 30, 2003.
64. Chalmers, J.J., Exploitation of Magnetic Nano-particles in Cell Analysis and Separation: Theoretical, Experimental and Clinical Considerations, **Tufts University**, February 3, 2003.
65. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, San Diego, CA, Oct. 30, 2002.
66. Chalmers, J.J., "Development of a Reliable, Routine Process to Isolate/Enrich Cancer Cells from Bone and Peripheral Blood Samples, **INNOVATIVE MOLECULAR ANALYSIS TECHNOLOGIES PI MEETING**, Chantilly, VA July 8-10, 2002.
67. Chalmers, J.J. "Development of a Reliable, Routine Process to Isolate/Enrich Cancer Cells from Bone and Peripheral Blood Samples". **2nd International NCI-EORTC Meeting on Cancer Diagnostics**, June 26-29, 2002.
68. Chalmers, J.J. "Scale-up of Mammalian Cell Bioreactors". **American Association of Pharmaceutical Scientists National Biotechnology Conference**, June 24-26, San Diego, CA. 2002.
69. Chalmers, J.J. "Magnetic-based Technologies", **Detection and Measurement of Occult Disease for the Prognosis of Solid Tumors** , NCI Jan 7-8, 2002.

70. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Atlanta, GA, Oct. 3, 2001.
71. Chalmers, J.J, "Immunomagnetic Cell Separation for Rare Cancer Cell Detection in Blood: Current Applications and Future Potential" **INNOVATIVE MOLECULAR ANALYSIS TECHNOLOGIES PI MEETING**, Washington D.C, June 27-29, 2001
72. Chalmers, J.J. "Surfactants in Animal Cell Culture" **MERCK**, West Point, PA. April 27, 2001.
73. Chalmers, J.J. "Cell Separation", **Genomic Sample Preparation conference, Cambridge Healthcare Institute**, April 26-27, 2001 in Boston, MA.
74. Chalmers, J.J." Characterization of the Magnetophoretic Mobility of cells Labeled with Paramagnetic Nanoparticels" **Particles 2001**, Orlando, FL February 24-27, 2001.
75. Chalmers, J.J. "Scale-up of Animal Cell Bioreactors" **MERCK**, West Point, PA. Oct. 13, 2000.
76. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, San Diego, Ca, September 25-28, 2000.
77. Chalmers, J.J. "Cell Separation Case Studies: Fundamental and Scale-Up", **ASME Bioprocess Equipment Seminar**, San Diego, Ca, September 25-28, 2000.
78. Chalmers, J.J. "A Proposed Methodology for the Scale-up/down of Animal Cell Bioreactors" **Biogen,** Cambridge Ma, Sept. 12, 2000.
79. Chalmers, J.J, "Immunomagnetic Cell Separation for Rare Cancer Cell Detection in Blood: Current Applications and Future Potential" **INNOVATIVE MOLECULAR ANALYSIS TECHNOLOGIES PI MEETING**, Washington D.C, July 6-8, 2000
80. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **MERCK**, West Point, PA. May 17-18, 2000.
81. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **MERIAL**, Lyon France. May 3, 2000.
82. Chalmers, J.J. "Exploitation of Immunomagnetic Labeling: Rapid Cell Sorting and Fractionation", Department of Bioengineering, **University of California, Berkeley**, March 13, 2000.
83. Chalmers, J.J. "Exploitation of Immunomagnetic Labeling: Rapid Cell Sorting and Fractionation", Department of Chemical Engineering, **Johns Hopkins University,** March, 2, 2000.
84. Chalmers, J.J. "Exploitation of Immunomagnetic Labeling: Rapid Cell Sorting and Fractionation", Department of Chemical Engineering, **Northwestern University,** Jan. 20, 2000.
85. Chalmers, J.J. "Exploitation of Immunomagnetic Labeling: Rapid Cell Sorting and Fractionation", Department of Chemical Engineering, **University of Maryland**, November 16, 1999.
86. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Denver, CO, October 19, 1999.
87. Chalmers, J.J., Zborowski, M. "The potential, and currently practical uses of immunomagnetic labels for detection" **First NASA & NCI Workshop on Sensors for Bio-Molecular Signatures**, Pasadena, Ca. June 2-4, 1999.
88. Zborowski, M., Chalmers, J.J. "Novel methods of cell separation using molecular and nanometer-scale magnetic reagents" **First NASA & NCI Workshop on Sensors for Bio-Molecular Signatures**, Pasadena, Ca. June 2-4, 1999.
89. Chalmers, J.J. "Immunomagnetic Cell Separation", Department of Chemical and Biochemical Engineering, **U. of Texas**, February 16, 1999.
90. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Boston, Ma., November 2-6, 1998.
91. Chalmers, J.J. "Immunomagnetic Cell Separation", Department of Chemical and Biochemical Engineering, **U. of Iowa**, October 16, 1998.
92. Chalmers, J.J. "Issues Surrounding the Scale-up of Animal Cell Culture", **Biogen Inc.**, June 22, 1998.
93. Chalmers, J.J., Haam, S., Zhou, Y., McCloskey, K., Moore, L., Zborowski, M., "Cell Tracking Velocity, **Scientific and Clinical Applications of Magnetic Carriers**, Cleveland, OH, May 28-30, 1998.
94. Zborowski, M., Moore, L., Sun, L., Chalmers, J.J., "Magnetic Flow Sorting", **Scientific and Clinical Applications of Magnetic Carriers**, Cleveland, OH, May 28-30, 1998.
95. Chalmers, J.J. "Determination of Cell Surface Marker Density Using Particle Tracking Velocity", **Cleveland Clinic Foundation**, October 3, 1997.
96. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Denver, CO, September 22, 1997.
97. Chalmers, J.J., "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors" **Merck Inc,** July 21, 1997.
98. Chalmers, J.J., "Immunomagnetic Cell Separation" **Biochemical Engineering X, Engineering Foundation Conferences**, Kananaskis, Canada, May 18-23, 1997.
99. Chalmers, J.J., "Immunomagnetic Cell Separation" **Cornell University**, February 27, 1997.
100. Chalmers, J.J., "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors" **Purdue University**, Nov. 21, 1996.

101. Chalmers, J.J., "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors" **University of Pittsburgh**, Nov. 8, 1996.
102. Chalmers, J.J. "Characterization and Quantification of Microbial Activity During the Composting Process" **World Environmental Congress (World '96),** Cincinnati, Ohio, Oct. 27-29, 1996.
103. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Berkeley, CA, October, 21, 1996.
104. Chalmers, J.J. "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors, and Interfacial Phenomena in Bioprocessing" **Genentech**, October 18, 1996.
105. Chalmers, J.J. "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors" **10th International Biotechnology Symposium**, Sidney, Australia, August 25-30, 1996.
106. Chalmers, J.J. "Panel Discussion on Gas-Liquid Interfaces and Cells" 42nd Annual Conference of **American Society of Artificial Internal Organs**, Washington D.C., May 3, 1996.
107. Chalmers, J.J. "Characterization of the Hydrodynamics in Different Types and Sizes of Bioreactors", **Genentech Inc.**, February 5, 1996
108. Chalmers, J.J. "Characterization of the Hydrodynamics in Different Types and Sizes of Bioreactors" **8th Annual Meeting of Japanese Association for Animal Cell Technology**, Iizuka, Japan, November 6-10, 1995.
109. Chalmers, J.J. "Fluids Engineering of Bioprocess Equipment", **ASME Bioprocess Equipment Seminar**, Boston, MA, November, 1995.
110. Chalmers, J.J. "The hydrodynamics in bioreactors and its relationship to cells" **University of Colorado**, March 8, 1995.
111. Chalmers, J.J. "The Impact of Interfaces on Cells and Proteins", **ASME Bioprocess Equipment Seminar**, San Diego, CA, October, 1994.
112. Chalmers, J.J. "The hydrodynamics in bioreactors and its relationship to cells" **Cornell University**, Sept. 13, 1994.
113. Chalmers, J.J., "What every Cell Culturist Needs to Know About Bubbles", **University of Cincinnati**, Cincinnati, OH May 12, 1994.
114. Chalmers, J.J., "What every Cell Culturist Needs to Know About Bubbles", **Cell Culture Engineering IV, Engineering Foundation Conference**, San Diego, CA, March 8-12, 1994.
115. Chalmers, J.J., "Where is the Engineering in Biochemical Engineering?", **Engineering Foundation Conference**, Princeton, NJ, July 11-16, 1993.
116. Chalmers, J.J., M. Garcia-Briones, R. Venkat, D. Chattopadhyay, "Hydrodynamics Within Bioreactors", **University of Virginia**, March 11, 1993.
117. Chalmers, J.J., M. Garcia-Briones, R. Venkat, D. Chattopadhyay, "Hydrodynamics Within Bioreactors", **Merck, Sharp, & Dohme Research Laboratories**, January 28, 1993.
118. Chalmers, J.J., M. Garcia-Briones, F. Bavarian, F. Hink, "Insect Cell Interactions with Gas Bubbles", **Baculoviruses and Recombinant Protein Production Processes Workshop**, Interlaken, Switzerland, March 29-April 1, 1992.
119. Chalmers, J.J. F. Bavarian, S. Goldblum, F. Hink, "Cell Bubble Interactions: Proposed Mechanisms of Cell Death in Sparged Bioreactors", **Cleveland State University**, Jan. 23, 1992.
120. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, "Cell-Bubble Interactions: Proposed Mechanisms of Cell Death in Sparged Bioreactors," **Ohio State Biochemistry Program**, Jan. 21, 1992.
121. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, "Cell-Bubble Interactions: Proposed Mechanisms of Cell Death in Sparged Bioreactors," **Ohio University**, Oct. 29, 1991.
122. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, Proposed Mechanisms of Cell Death in Sparged Bioreactors", **University of Kentucky**, Lexington, KY, Sept. 11, 1991.
123. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, "Cell-Bubble Interactions: Proposed Mechanisms of Cell death in Sparged Bioreactors", **Engineering Foundation Conference**, Santa Barbara, CA, March 3-8, 1991.
124. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, "Cell-Bubble Interactions: Proposed Mechanisms of Cell death in Sparged Bioreactors", **Amgen**, Thousand Oaks, CA, February 19, 1991.
125. Chalmers, J.J., F. Bavarian, S. Goldblum, F. Hink, "Cell-Bubble Interactions: Proposed Mechanisms of Cell death in Sparged Bioreactors", **Eli Lilly and Company**, Indianapolis, IN, Nov. 2, 1990.
126. Chalmers, J.J., S. Goldblum, F. Bavarian, "Investigations into the Mechanisms of Cell Damage/Death in Sparged Bioreactors", **DuPont**, Haskell Laboratory, July 20, 1990.
127. Chalmers, J.J., M.L. Shuler and D.B. Wilson, "Studies of the Continuous Production and Excretion of a Plasmid Encoded Protein from E. coli", **The Ohio State University, Department of Microbiology**, May 12, 1988.

AUTHOR OR CO-AUTHOR OF PRESENTED PAPERS AND POSTERS

1. Gómez-Pastora, J, Wu, X., Sundar, N., Alawi, J., Nabar, G., Winter, J.O., Zborowski, Z., Chalmers, J.J. Magnetophoretic capture of 5 nm sized superparamagnetic iron oxide nanoparticles under different gradient field conditions, **AIChE** Annual Meeting, Orlando, Fl. 2019.
2. Kim, J., Chalmers, J. Cell Tracking Velocimetry: A Femtogram Resolution Fluorescence Cytometric Magnetometer, **AIChE** Annual Meeting, Orlando, Fl. 2019.
3. Kim, J., Chalmers, J. Magnetic Separation of Apoptotic Red Blood Cells for Better Blood Transfusion Practices, **AIChE** Annual Meeting, Orlando, Fl. 2019.
4. Weigand, M. High Magnetic Energy Gradient Quadrupole Magnet to Fractionate Oxirase-Deoxygenated Low Iron Label-Less RBCs from Aged Blood Donations, **AIChE** Annual Meeting, Orlando, Fl. 2019
5. Chalmers, J.J. Quantitative characterization of the regulation of iron metabolism in glioblastoma stem-like cells using magnetophoresis, **ACS meeting**, Orlando, Fl, 2019.
6. Plencner, E., Amaya, P. Chalmers, J,J Single High-EDR Exposure of Cultured Human Cells Reveal Effects of Prolonged Doublings and Microcarrier Attachment on Cell Shear Susceptibility, **AIChE Annual Meeting,** San Francisco, CA, 2016
7. Kyoung-Joo Jenny Park, Thomas Testoff, Joseph Adams, Richard Pawlowski, and Jeffrey Chalmers, Glucose and Iron Metabolism in Cancer Stem Cells, 2016 **Gordon Research Conference**
8. Zborowski, M., Moore, L.R., Chalmers, J.J. Tessellated permanent magnets for flow-through, open gradient separations of weakly magnetic materials. **11th International Conference on the Scientific and Clinical Applications of Magnetic Carriers.** Vancouver, CA, May, 2016
9. Youngqi Wu, Kyoung-Joo Jenny Park, Clayton Deighan, Peter Amaya, Susanne Wells, Marion Brusadelli, Elizabeth Hoskins, Kris Jatana, Quintin Pan, and Jeffrey J. Chalmers. "Single Molecule, in-Situ, RNA Imaging of Viral RNA of Human Papillomavirus in Circulating Tumor Cells" **AIChE Annual Meeting**, Atlanta, GA. November 19, 2014.
10. Chalmers, J.J. Single Cell Omics, **Cell Culture Engineering XIV,** May 4-8, 2014, Quebec city, CA
11. Chalmers, J.J. On-chip Magnetic Cell Separation and Encapsulation, **AIChE Annual Meeting**, SF, CA, November , 2013.
12. Chalmers, J.J. Simultaneous, m-RNA and/or micro-RNA, and protein expression on individual, circulating tumor cells using a combinations of molecular probes and antibodies and quantitative, multispectral deconvolution technology. **AIChE Annual Meeting**, SF, CA, November , 2013.
13. Chalmers, J.J., Characterization and quantification of the intrinsic magnetization of a number of cell types. **AIChE Annual Meeting**, Pittsburgh, PA, October, 2012.
14. Chalmers, J.J., Xu, J., Zborowski, M., Poister, Magnetic separation of algal for biofuel production. **AIChE Annual Meeting**, Pittsburgh, PA, October, 2012.
15. Chalmers, J.J., Byvank, T., Vieira, G., Sooryakumar, R. Separating magnetically labeled and unlabeled biological cells within microfluidic channels using magnetic traps created with nanowires and disks. **AIChE Annual Meeting**, Pittsburgh, PA, October, 2012
16. Jatana, K., Balasubramanian, P., Lang, J.C., Schuller, D.E., Teknos, T.N., Ozer, E., Old, M., Chalmers, J.J. Detection of circulating tumor cells in patients with squamous cell carcinoma of the head and neck. 8th International Conference on Head and Neck Cancer, **AHNS**, Toronto,Canada, July 24, 2012.
17. Moore, L.R., Dorn, J., Nehl, F., Abbot, S., Chalmers, J.J., Zborowski, M. Open gradient magnetic red blood cell sorter evaluation on model cell mixtures. **9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers.** Minneapolis Mn, May, 2012.
18. Mahajan, K.D., Vieira, G., Runa, G., Chalmers, J.J., Sooryakumar, R. Winter, J.O. Magnetic Nanoconveyer Belts for Cell and Molecular Separation. **9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers.** Minneapolis Mn, May, 2012
19. Chalmers, J.J., Xu, J. Sun, J. Jin, X., Zborowski, M. Characterization and Quantification of the intrinsic magnetization of a number of cell types. **9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Minneapolis Mn, May, 2012
20. Moore, R., Lo, V., Sivalenka, R., Guo, X., Khandker, L., Voskinarian-Berse, V., Kang, L., Zhang, X., Berstein, I., Miller, R., Kameneva, M., Yazer, M., Moore, L., Zborowski, M., Chalmers, J.J. Glen, K., Thomas, R., Stacey, A., Wylde, A., Owen, S., Abbot, S. Single Use Bioreactor System for Large Scale Production of Erythrocytes from Human Cord Blood Derived Hematopoietic Stem Cells. **Engineering Foundation Conference: Cell Based Therapies** 2012, Jan. 2012
21. Chalmers, J., Xu, J., Zborowski, Boister, B. Magnetic Separation of Algal for Biofuel Production. **AIChE Annual Meeting,** Minneapolis, MN, October, 2011.
22. Chalmers, J., Garcia-Villa, A., Balasubramanian, P, Miller, B., Lustberg, M., Nutter, J., Gruzs, K., Shaaf, L., Layman, R., Wesolowski, R., Mrozec, E., Sharpiro, C.L., Grever, M.R., Chalmers, J.J., Ramaswamy, B. Technologies to Determine the Effectiveness of Experimental Drugs: Are Circulating Tumor Cell one possible solution? **AIChE Annual Meeting,** Minneapolis, MN, October, 2011.

23. Xu, J., Moore, L., Zborowski, M., Chalmers, J.J. High-throughput, Continuous Magnetic Sorting of Unlabeled Red Blood Cells (RBC) and Analysis by Cell Tracking Velocimetry. **AIChE Annual Meeting,** Minneapolis, MN, October, 2011.
24. Garcia-Villa, A., Balasubramanian, P, Miller, B., Lustberg, M., Nutter, J., Gruzs, K., Shaaf, L., Layman, R., Wesolowski, R., Mrozec, E., Sharpiro, C.L., Grever, M.R., Chalmers, J.J., Ramaswamy, B. Measurement of gamma-H2AX in circulating tumor cells (CTC) from patients receiving ABT-888 (veriparib) in combination with carboplatin on a phase I does- escalation study (OSU-10080/NCI8609). **ASCO, Breast Cancer Symposium, 2011**. Sept. 8-10,2011.
25. Simler, J., Kittredge, A., Cunningham, M., Mumira, J., Rings, J., Berdugo, C., Chalmers, J.J., Hahn, J. Rapiekjko, P.J. Mobius Sensor Ready Technology: A Novel Approach to Monitoring Single-Use Bioreactors. **ESCAT**, May 16-20, 2011.
26. Zborowski, M., Williams, P.S., Chalmers, J.J. Magnetic pressure as a scalar representation of field effects in magnetic suspensions. **9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Rostock, Germany, 2010.
27. Chalmers, JJ., Balasubramanian, P. Miller, B. Mutliparameter Analysis of circulating tumor cells, CTC, in clinical samples using purely negative selection. **AIChE Annual Meeting**, Salt Lake City, November, 2010.
28. Berdugo, C., Chalmers, J.J. Investigation of Stress Response Expression in Animal Cell Culture. **AIChE Annual Meeting**, Salt Lake City, November, 2010.
29. Berdugo, C., Zhao, Y., Sadeli, A., Brodkey, R., Chalmers, J.J. Large area dye mixing studies using image analysis. **AIChE Annual Meeting**, Salt Lake City, November, 2010.
30. Jin, X., Yazer, M., Chalmers, J.J., Zborowski, M. Theoretical and Experimental Verification of Changes in oxygen binding capability of Red Blood Cell based on magnetic susceptibility. **AIChE Annual Meeting**, Salt Lake City, November, 2010.
31. Jin, X., Abbot, S., Zhang, X. Kang, L., Vaoskinarian-Berseb, V., Zhao, R., Kameneva, M.V., Moore, L.R., Chalmers, J.J. Zborowski, M. Erythrocyte enrichment from hematopoietic stem cell cultures by magnetic separation**. ISEH, Melbourne, Australia**, Sept, 2010.
32. Balasubramanian, P., Lang, J.C., Jatana, K.R., Agrawal, A., Ozer, E. Schuller, D.E., Tecknos, T.N., Lustberg, M.B., Chalmers, J.J. Mutliparameter Analysis of negatively enriched, circulating tumor cells, TCT, in head and neck cancer patients. **2010 ASCO-NCI-EORTC** Annual Meeting on Molecular Markers in Cancer, Hollywood, Fl. Oct 18-20, 2010.
33. Jantana, K, Balasubramanian P, Lang JC, Agrawal A, Ozer E, Schuller DE, Teknos TN, Lustberg MB, Chalmers JJ. Significance of circulating tumor cells in patients with squamous cell carcinoma of the head and neck. **AHNS**, April 28-29, 2010. Las Vegas, Nevada.
34. Sun, J., Chalmers, J.J. Correlations of both the presence of and oxidation state of Mn in Bacillus attrophaeus spores and it imparting of magnetic susceptibility to the spores. **ACS Meeting**, San Francisco, CA. March 22, 2010.
35. Lustberg, MD, Balasubramanian, P., Lang, J.C., Ruppert, A.S., Carothers, S., Berger, M.J., Mrozek, E., Ramaswamy, B., Layman, R.C., Chalmers, J., Shapiro, C.L., Isolation of circulating tumor cells (CTCs) with mesenchymal and stem cell markers in localized and metastatic breast cancer using a novel negative selection enrichment, **American Association for Cancer Research,** April 17-21, 2010, Washington D.C.
36. Lustberg, MD, Balasubramanian, P., Lang, J.C., Ruppert, A.S., Carothers, S., Berger, M.J., Mrozek, E., Ramaswamy, B., Layman, R.C., Chalmers, J., Shapiro, C.L., Isolation of circulating tumor cells (CTCs) with mesenchymal and stem cell markers in localized and metastatic breast cancer using a novel negative selection enrichment, **American Association for Cancer Research: EMT and Cancer Progression and Treatment**, February 28 – March 2, 2010. Arlington, VA.
37. Balasubramanian P, Lang JC, Jatana KR, Agrawal A, Ozer E, Schuller DE, Teknos TN, Lustberg MB, Chalmers JJ. Does EMT occur in circulating tumor cells of head and neck cancer patients? **American Association for Cancer Research: EMT and Cancer Progression and Treatment**, February 28 – March 2, 2010. Arlington, VA.
38. Shenkman, R., Chalmers, JJ, Zborowski, M., Moore, L., Nehl, F. Magnetic Sorting of Unlabeled Red Blood Cells (RBC) **AIChE Annual Meeting**, November, 2009.
39. Chalmers, JJ, Xiong, J., Jin, X., Shao, M., Tong, X., Farag, S., Zborowski, M. Quantification of Nonspecific Binding of Nanoparticles using cell tracking velocimetry: Implication for detection and magnetic cell separation. **ACS Meeting**, Washington D.C., August 16-20, 2009.
40. Moore, L., Barrett, M., Hoyos, M., Williams, P.S., Chalmers, J.J., Zborowski, M., Quadrupole magnetic SPLITT fractionation. **ACS Meeting**, Washington D.C., August 16-20, 2009.
41. Balasubramanian, P., Lang, J., Jatana, K., Schuller, D., Agarwal, A., Zborowski, M., Chalmers, J.J. Are

circulating tumor cells present in the peripheral blood of cancer patients cancer stem cells? **ACS Meeting**, Washington D.C., August 16-20, 2009.

42. Godoy-Silva, R., Chalmers, J.J., Casnocha, S.A., Ma, Ningning. Quantitative Study of Physiological Responses of CHO Cells to Repetitive Hydrodynamic Stress. **AICHE Annual Meeting, Philadelphia, PA**. November 2008.
43. Chalmers, J.J. Xiong, Y., Shao, M., Tong, X. Farag, S., Zborowski, M. Quantification of non-Specific Binding of Magnetic Nanoparticles: Implication for detection and magnetic cell separation. **AICHE Annual Meeting, Philadelphia, PA**. November 2008.
44. Berdugo, C., Balasubramanian, P., Elliot, S., Chalmers, J.J. Effect of hydrodynamic conditions on cell cycle and stress proteins. **AICHE Annual Meeting, Philadelphia, PA**. November 2008.
45. Balasubramanian, P., Yang, L., Lang, J.C., Schuller, D., Agrawal, A., Zborowski, M., Chalmers, J.J. Optimization of An Enrichment Process for Circulating Tumor Cell from the Blood of Head and Neck Cancer Patients through Depletion of Normal Cells. **AICHE Annual Meeting, Philadelphia, PA**. November, 2008.
46. Chalmers, J.J. Yang, L., Balasubramanian, Lang, J., Jakana, K., Shuller, D., Zborowski, M., Detection of CTC in head and neck cancer patients with potential clinical outcomes. **ASCO-NCI EORTC Annual Meeting on Molecular Markers in Cancer**. Hollywood FL. Oct. 30- Nov 1, 2008.
47. Hu, W., Wu, Y., Wyslouzil, B., Chalmers, J.J. Potential new protective additives and delivery methods for Cell Culture. **Cell Culture Engineering XI**, 2008, Sunshine Coast, Queensland, Australia.
48. Chalmers, J.J, Xiong, Y., Shao, M., Tong, X., Zborowski, M. Quantification of Non-Specific Binding of Magnetic Nanoparticles: Implication for detection and magnetic cell separation. **7th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Vancouver, BC. May, 2008.
49. Schneider, T., Moore, L.R., Chalmers, J.J., Zborowski, M. Scale-up and comparability study of T-cell depletion in single inlet-single outlet QMS**, 7th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Vancouver, BC. May, 2008.
50. Xiong, X., Tong, X., Farag, S., Chalmers, J.J. Optimization of alloreactive depleted T-cell transplants: The use of MACS beads and MACS columns. **AICHE Annual Meeting**, Salt Lake city, Utah, November 5-9, 2007
51. Chalmers, J.J., Xiong, Y., Zhang, H. Detection and Quantification of Low Expressing Surface Markers Using Magnetic Nanoparticles. **BioChem Eng XV**, July 15-19, 2007; Quebec, Canada.
52. Berdugo, C., Malik, A., Godoy, R.D., Chalmers, J.J. Relationship between Hydrodynamic Forces and the Cell Cycle: Implications to Bioprocessing. **BioChem Eng XV**, July 15-19, 2007; Quebec, Canada.
53. Chalmers, J.J., Jin, X. Zhao, Y., Moore, L., Williams, S., Zborowski, M., Is it Del B, or Del B^2? That is the question. **AIChE Annual meeting**, November 12- 17, 2006.
54. Tong, X., Zborowski, M., Farag, S., Chalmers, J. New Immunomagnetic Beads for T cell depletion. . **AIChE Annual meeting**, November 12- 17, 2006.
55. Shenkman, R., Papas, K., Choi, H., Moore, L., Hering, B., Chalmers, J. Biocompatible and Biodegradable Nanoparticle Labels. **AIChE Annual meeting**, November 12- 17, 2006.
56. Yang, L., Tong, X., Lang, J., Zborowski, M., Chalmers, J. J. Application of immunomagnetic cell enrichment in combination with RT-PCR for the detection of rare circulating cancer cells in peripheral blood and bone marrow from patients with Head and Neck Squamous Cell Carcinoma (HNSCC). **AIChE Annual meeting**, November 12- 17, 2006.
57. Godoy, R., Berdugo, C Chalmers, J. The Use of Energy Dissipation Rate as a Parameter to Assist in the Evaluation, Scale-up, and Scale-down of Bioprocesses. **AIChE Annual meeting**, November 12- 17, 2006.
58. Chalmers, J.J., Godoy, R., Berdugo, C., The use of Energy Dissipation Rate as a parameter to assist in the evaluation , scale-up, and scale-down of bioprcoesses, **ACS Annual Meeting**, Sept 6-10, 2006. San Fran. CA.
59. Chalmers, J.J., Jung, Y., Mai, N., Penn, M., Zborowski, M., Quantitative intracellular magnetic nanoparticle uptake determination from cell magnetophoresis. **ACS Annual Meeting**, Sept 6-10, 2006. San Fran. CA.
60. Hu, Weiwei, Rathman, J.F., Chalmers, J.J. Mass screening of surfactants Additives for Mammalian Cell Culture. **ACS Annual Meeting**, Sept 6-10, 2006. San Fran. CA.
61. Moore, L.R., Williams, P.S., Jin, X., Chalmers, J.J., Zborowski M., Comparison of Force Models in Predicting Performance of the Quadrupole Magnetic Sorter 6th **International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Krems, Austria, May 20-22, 2006.

62. Chalmers, J.J., Tong, X., Melnik, K., Detection of disseminated tumor cells in bone marrow of breast cancer patients. 6th **International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Krems, Austria, May 20-22, 2006.
63. Godoy, R., Chalmers, J.J. The effect of multiple passes of EDR on suspended Animal Cells. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
64. Mehta, B., Chalmers, J.J. Optimization of Tissue Disaggregation, **AIChE Annual meeting**, October 30 – Nov. 4, 2005.
65. Chalmers, J.J., Zhang, H., Williams, P.S., Zborowski, M. The Effect of Magnetic Nanoparticles on the Binding Affinity/Avidity of Antibody-Antigen Interactions. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
66. Xiong, Y., Tong, X., Farag, S., Zborowski, M., Chalmers, J.J. The Scale-up of T Cell Depletion for Mismatched Bone Marrow Transplants. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
67. Chalmers, J.J., Melnik, K., Zborowski, M., Magnetic Detection of Spores. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
68. Yang, L., Tong, X., Zborowski, M., Detection of Rare Cancer cells in Peripheral Blood. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
69. Shao, M., Farag, S., Zborowski, M., Chalmers, J.J. Generation of Alloreactive T cells In-Vitro for Cellular Therapy. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
70. Hu, W., Gladue, R., Hansen, J., Chalmers, J.J. Microalgal Fermentation Scale-up Considerations. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
71. Shenkman, R., Papas, K., Hering, B., Chalmers, J.J. Quadrupole Magnetic Separation (QMS) of Porcine Islets of Langerhans. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
72. Tong, X., Melnik, K., Braun, S., Zborowski, M., Chalmers, J.J. Detection of Disseminated Tumor Cells in Bone Marrow of Breast Cancer Patients. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
73. Jing, Y., Moore, L., Chalmers, J.J. Zborowski, M. Negative Selection of Blood Progenitor Cells by Continuous Magnetophoresis. **AIChE Annual meeting**, October 30 –Nov. 4, 2005.
74. Rampersaud, A., Melnik, K., Walczak, R., Chalmers, J.J. Nanobeads for Cancer Cell Selection**, Sixth Principal Investigators Meeting Innovative Molecular Analysis Technologies Program**, September 7-9, 2005.
75. Tong, X., Yang, L. Melnik, K., Lang, J., Braun, S., Zborowski, M., Chalmers, J. Detection of rare circulating/disseminated tumor cells in human body fluids**, BioChem Eng XIV**, July 10-14, 2005; Harrison Hot Springs, BC, Canada.
76. Shao, M., Farag, S., Chalmers, J.J., Optimize the generation and depletion of alloreactive T cell subsets for cellular therapy, **BioChem Eng XIV**, July 10-14, 2005; Harrison Hot Springs, BC, Canada.
77. Zhang, H., Moore, L. Zborowski, M., Chalmers, J.J., Quantification of the field interaction parameter of magnetic nanoparticles and the effect of magnetic nanoparticles on antibody binding affinity , **BioChem Eng XIV**, July 10-14, 2005; Harrison Hot Springs, BC, Canada.
78. Melnik, K., Moore, L., Zborowski, M., Chalmers, J.J., Fractionation of Immunomagnetically Labeled, Human Cord Blood Progenitor Cells Using a Novel Dipole Magnetic Flow Cell Sorter, **BioChem Eng XIV**, July 10-14, 2005; Harrison Hot Springs, BC, Canada.
79. Jing,Y., Haam, S.J., Moore, L.R., Zhao, Yu, Chalmers, J.J., Zborowski, M., Blood Progenitor Separation from Clinical Apheresis Products by Magnetic Nanoparticle Binding and Magnetophoresis. **229th ACS National Meeting**, San Diego CA, 2005.
80. Shao, M., Lara, O., Farag, S., Chalmers, J. Alloreactive T cell depletion using Quadrupole magnetic flow sorter for allogeneic stem cell transplantation and cellular therapy, **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX.
81. Hu, W., Mollet, M., Chalmers, J. Two Circuits or One? Should O2 addition and CO2 removal be uncoupled? **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX.
82. Mehta, B, Jewell, S., Eng, C., Chalmers, J. Development and/or Optimization of a Process to Obtain Homogeneous Cell Populations from Human Tumors, **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX.
83. Mehta, B., Holman, D**.,** Grzybowski, D. Chalmers**,** Development of 2-D and 3-D culturing techniques to isolate Pia-Arachnoid Cells from human brain tissue, **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX.
84. Chalmers, J., Mollet, M., Godoy, R. The Impact of Fluid Mechanical Forces in Flow Cytometers on Cells. **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX.

85. Chalmers, J., Mollet, M., Godoy, R. Effects of Hydrodynamic Stress on Suspended Mammalian Cells, **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX
86. Mehta, B., Chalmers, J. Effect of pH on cell density during isopycnic separation of cells using percoll density gradient. **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX
87. Mehta, B., Holman, D**.,** Grzybowski, D. Chalmers An In Vitro Model to Study Cerebrospinal Fluid Physiology and Pseudotumor Cerebri. **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX
88. Tong, X., Lara, O., Chalmers, J. Studies on the enrichment of rare cancer cells. **AIChE Annual Meeting**, November 7-12, 2004, Austin, TX
89. Tong, X., Lara, O. Chalmers, J.J., Studies on the enrichment of rare cancer cells in human peripheral blood. **BMES** Philadelphia, PA Oct 15, 2004.
90. Mehta, B. Chalmers, J. Development &/or Optimization of a Process to Obtain Homogeneous Cell Populations from Human Tumors, **BMES** Philadelphia, PA Oct 15, 2004.
91. Mehta, B, Holman, D., Grzybowski, D., Chalmers, J.A Separation Technique to Isolate Arachnoid Cap Cells, **BMES** Philadelphia, PA Oct 15, 2004.
92. Mehta, B, Holman, D., Grzybowski, D., Chalmers, J, Development of 2D & 3D culture techniques to isolate Pia-Arachnoid(PA) Cells from human brain tissue, **BMES** Philadelphia, PA Oct 15, 2004.
93. Shao M., Lara O., Farag, S., Zborowski, M., Chalmers J. Alloreactive T cell depletion using Quadrupole magnetic cell sorter for allogeneic stem cell transplantation and cellular therapy. **BMES** Philadelphia, PA Oct 15, 2004.
94. Chalmers, J.J., Zhang, H., Zborowski, M. Quantification of the field interaction parameter and binding affinity of antibody or streptavidin/biotin conjugated magnetic nanoparticles. **5th International Conference on the Scientific and Clinical Applications of Magnetic Carriers.** Lyon France, May 20-22, 2004.
95. Carpino, F., Moore, L.R., Zborowski, M., Chalmers, J.J., Zborowski, M., Analysis of Magnetic Nanoparticles using Quadrupole Magnetic Field-Flow Fractionation. **5th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Lyon France, May 20-22, 2004.
96. Chalmers, J.J., Lara, O., Tong, X. Shao, M., Farag, S., Zborowski, M., Alloreactive T-Cell Depletion: The solution to the challenge of bone marrow transplants? **5th International Conference on the Scientific and Clinical Applications of Magnetic Carriers**. Lyon France, May 20-22, 2004.
97. Zhang, H., Chalmers, J.J., Zborowski, M., Screening of protein library by magnetic separation: a theoretical analysis. **227th ACS Spring Meeting**, Anaheim, CA, March 28-April 1, 2004.
98. Chalmers, J.J. Lara, O., Shao, M., Farag, S., Zborowski, M. Alloreactive T-Cell Depletion: The solution to the challenge of bone marrow transplants, **Cell Culture Engineering IX**, Cancun MX, March 7-11, 2004.
99. Mollet, M., Arden, N., Godoy, R., Betenbaugh, B., Chalmers, J.J. Physiological Effects and Potential Inhibition of Hydrodynamic Forces on Animal Cells, **Cell Culture Engineering IX**, Cancun MX, March 7-11, 2004.
100. Zhang, H., Zborowski, M., Williams, S., Chalmers, J.J. Characterization of Magnetic Nano-Carriers. **AIChE Annual Meeting**, November 16-21, 2003, San Francisco, CA.
101. Zhao, Y., Zborowski, M., Zhang, H., Shao, M., Chalmers, J.J. Electromagnetic Cell Tracking Velocimetry, **AIChE Annual Meeting** , November 16-21, 2003, San Francisco, CA.
102. Lara, O., Shao, M., Farag, S., Caligiuri, M.,, Zborowski, M., Chalmers, J.J. Immunomagnetic Cell Separation: Application of the Quadrupole Cell Sorter (QMS) to T-cell Depletion for Allogeneic Transplantation. **AIChE Annual Meeting** , November 16-21, 2003, San Francisco, CA.
103. Mehta, B., Chalmers, J.J. Development and/or Optimization of a Process to Obtain Homogenous Cell Populations from Human Tumors. **AIChE Annual Meeting** , November 16-21, 2003, San Francisco, CA.
104. Mollet, M., Chalmers, J.J., Hydrodynamic Forces: Apoptosis and Cytoskeletal Effects. **AIChE Annual Meeting** , November 16-21, 2003, San Francisco, CA.
105. Zhang, H., Zborowski, M., Chalmers, J.J., Solid Phase/Nanoparticle Binding Studies. **AIChE Annual Meeting** , November 16-21, 2003, San Francisco, CA.
106. Lara, O., Shao, M., Guimond, M., Farag, S., Caligiuri, M., Zborowski, M., Chalmers, J.J. Examples of the Application of the Quadrupole Magnetic Cell Sorter: Rare Cell Selection and T-cell Depletion. **11th International Symposium on Field-Flow Fractionation**, Cleveland, Ohio, October 7-10, 2003.
107. Zborowski, M., Moore, L.R. Felon, L., Williams, P.S., Chalmers, J.J. Transport Processes in Magnetic Axisymmetric SPLITT Fractionation, **11th International Symposium on Field-Flow Fractionation**, Cleveland, Ohio, October 7-10, 2003.
108. Moore, L.R., Williams, P.S., Felon, L., Chalmers, J.J., Zborowski, M., Magnetic Contrast Agent Enhances Performance of MgSPLITT, **11th International Symposium on Field-Flow Fractionation**, Cleveland, Ohio, October 7-10, 2003.

109. Zhang, H., Zborowski, M., Chalmers, J.J. Immuno-Magnetic Separation of Bacillus Cereus Spores form Foods. **11th International Symposium on Field-Flow Fractionation**, Cleveland, Ohio, October 7-10, 2003.
110. Chalmers, J.J., Zhang, H., Williams, P.S., Zborowski, M. Magnetic Nanoparticles: Past, Present and Future Applications in Biological Systems, **Biochemical Engineering XIII.** Boulder, CO**,** July 18-23, 2003.
111. Chalmers, J.J., Lara, O., Zborowski, M**.** High-throughput Immunomagnetic Cell Separation. **Biochemical Engineering XIII.** Boulder, CO**,** July 18-23, 2003.
112. Mollet, M., Chalmers, J. Quantification of Lethal and Non-lethal Effects of Hydrodynamic forces on Animal Cells. **Biochemical Engineering XIII.** Boulder, CO**,** July 18-23, 2003.
113. Zhang, H., Wewers, M., Doseff, A., Zborowski, M., Chalmers, J.J, A Novel Immunomagnetic Based Technology to Quantify Antigen Binding Capacity (ABC) on Human Aveolar Macrophages. **American Thorasic Society** (ATS) May 16-21, 2003. Seattle, Wash.
114. Mollet, M., Ma, N. Chalmers, J.J., Quantification of Lethal and NonLethal Effects of Hydrodynamic Forces on Animal Cells. **AIChE Annual Meeting**, November 3-8, 2002, Indianapolis, IN.
115. Lara, O., Nakamura, N., Chalmers, J.J., Development of a Reliable, routine Process to Isolate/Enrich Cancer Cells from Bone and Peripheral Blood Samples. **AIChE Annual Meeting**, November 3-8, 2002, Indianapolis, IN.
116. Lara, O., Nakamura, N., Mollet, M. Non-ideal flow in Magnetic Cell Devices. **AIChE Annual Meeting**, November 3-8, 2002, Indianapolis, IN.
117. Ostera, G. R., Schechter, A.N. Moore, L.R., Milliron, S., Meck, J.M., Chalmers, J.J., Zborowski, M. Cell Magnetophoresis: Separation of erythroid cells based on hemoglobin magnetic susceptibility. 13th Fetal Workshop, Baltimore, Md, Oct 15, 2002.
118. Ostera, G. R., Schechter, A.N. Moore, L.R., Milliron, S., Meck, J.M., Chalmers, J.J., Zborowski, M. Cell Magnetophoresis: Separation of erythroid cells based on hemoglobin magnetic susceptibility. 2002 Annual Meeting of the American Society of Hematology, December 8, 2002.
119. Mollet, M., Chalmers, J. Potential and Real Cell Death in Micro-Flow Systems. **American Chemical Society, Boston**, **MA** August 18-22, 2002.
120. Chalmers, J., Ma, N., Mollet, M., Characterization of Animal Cell Bioreactors with Respect to Local Energy Dissipation and a Proposed, Rational Scale-up/Scale-down Methodology. **American Chemical Society, Boston**, **MA** August 18-22, 2002.
121. Lara, O., Nakamura, M., Chalmers, J., Zborowski, M. Negative depletion cell sorting using a Quadrupole Magnetic Cell Sorter (QMS), **4th Scientific and Clinical Applications of Magnetic Carriers,** May, 2002, Tallahassee,FL.
122. Zhang, H., Chalmers, J., Zborowski, M. Characterization/quantification of the factors involved in imparting a magnetophoretic mobility on cells and particles, **4th Scientific and Clinical Applications of Magnetic Carriers,** May, 2002, Tallahassee,FL.
123. Moore, L.R., Williams, P.S., Chalmers, J.J., Zborowski, M. Magnetic Flow Sorting Using Susceptibility-Modified Carrier Fluids. **4th Scientific and Clinical Applications of Magnetic Carriers,** May, 2002, Tallahassee,FL.
124. Williams, P.S. Moore, L.R., Chalmers, J.J., Zborowski, M. The Potential of Quadrupole Magnetic Field-Flow Fractionation for Determining Particle Magnetization Distributions. **4th Scientific and Clinical Applications of Magnetic Carriers,** May, 2002, Tallahassee,FL.
125. McCloskey, K., Leigh, D., Zborowski, M., Chalmers, J.J. CD34 Antigen Expression on Hematopoetic Progenitor Cells is Related to Efficiency of Magnetic Cell Separation. **Cell Culture Engineering VIII**. April 1-6, 2002.
126. Chalmers, J., Ma, N., Mollet, M. Characterization of Animal Cell Bioreactors with Respect to Local Energy Dissipation and a Proposed, Rational Scale-up/Scale-down Methology. **Cell Culture Engineering VIII**. April 1-6, 2002.
127. Ma, N., Aunins, J., Zhou, W., Xie, L. Quantitative Studies of Mammalian Cell Attachment to Bubble and Damage from Gas Sparging. **Cell Culture Engineering VIII**. April 1-6, 2002.
128. Ma, N. Quantification of Cell Damage By Hydrodynamic Forces using Microflow Channels. **AIChE Annual Meeting**, November 4-9, 2001.
129. McCloskey, K., Leigh, D., Chalmers, J. Analysis of Antigen Expression on Hematopoetic Progenitor Cells for Magnetic Cell Separation. **AIChE Annual Meeting**, November 4-9, 2001.
130. Chalmers, J.J., Melnik. K., Moore, L., Zborowski, M. Fractionation of Immunomagnetically Labeled Hematopoietic Progenitor Cells into Functionally Different Subfractions. **AIChE Annual Meeting**, November 4-9, 2001.

131. Chalmers, J.J. Zborowski, M., Exploitation of Magnetic Nano-particles in Cell separation: Theoretical and Experimental Considerations**. Biochemical Engineering XII.** Rohnert Park, Ca. June 10-15, 2001.
132. McCloskey, K.E., Zborowski, M., Chalmers, J.J. Characterization of Magnetophoretic Mobility: An Overview, **Biochemical Engineering XII.** Rohnert Park, Ca. June 10-15, 2001.
133. McCloskey, K., Chalmers, J., Moore, L., Zborowski, M. Performance of Continuous Magnetic Cell Separation is a Function of Cellular Antibody Binding Capacity. 221st **ACS National Meeting**, San Diego, Ca. April 1-5, 2001.
134. Zborowski, M. Moore, L.R., McCloskey, K.E., Nakamura, M., Williams, S., Chalmers, J.J. Performance of a quadrupole-filed sorter tested by separation of blood progenitor cells. 221st **ACS National Meeting**, San Diego, Ca. April 1-5, 2001.
135. Nakamura, M., Decker,K., Comella, K., Chosy, J., Moore, L., Zborowski, M., Chalmers, J. An Integrated Approach to Optimizing Immunomagnetic Cell Separation using a Quadrupole Magnetic Flow Sorter, **AIChE Annual Meeting**, November 13-17, 2000.
136. McCloskey, K., Zborowski, M., Chalmers, J**.** Immunomagnetic Cell Separation: Experimental & Theoretical Characterization of Magnetophoretic Mobility. **AIChE Annual Meeting**, November 13-17, 2000.
137. Chalmers, J. Lee, S.Y., Rathman, R.F, Yang C. Younger, A. An attempt to Develop a Mechanistic Methodology to Understand Interfacial Phenomena in Animal Cell Culture. **AIChE Annual Meeting**, November 13-17, 2000.
138. Chalmers, J.J., McCloskey, K., Nakamura, N., Comella, K. Melnick, K., Chosy, J., Zborowski, M. Quantification of magnetophoretic mobility with Cell Tracking Velocimetry: Current and potential applications. **3rd Scientific and Clinical Applications of Magnetic Carriers,** May, 2000, Rostock Germany.
139. Chalmers, J.J., Nakamura, M., Melnick, K., Zborowski, M., Evaluation of the performance of a commerical immunomagnetic cell separation system and the "Fractionation" of CD34+ cells based on magnetophoretic mobility. **3rd Scientific and Clinical Applications of Magnetic Carriers,** May, 2000, Rostock, Germany.
140. Chalmers, J.J., Nakamura, M., Decker, K., Chosy, J., Comella, K., Melnik, K., Moore, L., Zbrowski, M., An Integrated Approach to Optimizing Breast Cancer Cell Separation by Quadrupole Magnetic Flow Sorter. **3rd Scientific and Clinical Applications of Magnetic Carriers,** May, 2000, Rostock, Germany.
141. Ma, Ningning, Brodkey, R.S., Taticek, R., Chalmers, J. Quantification of the Magnitude and Distribution of the local energy dissipation in bioreactors. **Cell Culture Engineering VII**, Santa Fe, NM, Feb. 5-10, 2000.
142. Chalmers, J.J., Ma, N., Brodkey, R.S., Taticek, R. A proposed methodology for Scale-Up and Scale-down of animal cell culture Bioreactors. **Cell Culture Engineering VII**, Santa Fe, NM, Feb. 5-10, 2000.
143. Yang, C., Bokroth, L., O'Neil, M., Rathman, J., Chalmers, J. Mechanistic Studies of Interfacial Phenomena in CHO Cell Cultures. **Cell Culture Engineering VII**, Santa Fe, NM, Feb. 5-10, 2000.
144. Ma, N., Gregoriades, N., Clay, J., Koelling, K., Brodkey, R., Chalmers, J., Can "Local Energy Dissipation" be used to Quantify the Effect of Hydrodynamic Forces on Cells in Bioreactors and for Scale-up? **AIChE Annual Meeting**, Oct. 31 -Nov. 5, 1999.
145. Nakamura, M, McKloskey, K., Zborowski, M., Lasky, L., Melnik, K., Chalmers, J. Does Cell Surface Marker Density (number) Indicate Cell Function? **AIChE Annual Meeting**, Oct. 31 -Nov. 5, 1999.
146. McCloskey, K., Zborowski, M., Chalmers, J. Quantification of the Number of Cell Surface Markers (Receptors). **AIChE Annual Meeting**, Oct. 31 -Nov. 5, 1999.
147. Zborowski, M., Sun, L., Moore, L.R., Williams, P.S., Chalmers, J.J. Rapid flow cell sorting in an axisymmetric magnetic field and an annular SPLITT channel. **8th International Symposium on Field-Flow Fractionation FFF '99**, September 6 - 8, 1999, Paris, France.
148. Moore, L.R., Zborowski, M., Williams, P.S., Sun, L., Chalmers, J.J. Performance of a quadrupole-field flow cell sorter predicted on the basis of SPLITT formalism. L.R. Moore, M. Zborowski, P.S. Williams, L. Sun, J.J. **8th International Symposium on Field-Flow Fractionation FFF '99**, September 6 - 8, 1999, Paris, France.
149. Hoyos, M., Moore, L.R, McCloskey, K., Nakamura, M., Chalmers, J.J., Margel, S., Zborowski, M., Study of magnetic particles pulse-injected into an annular SPLITT channel in a quadrupole magnetic field. **8th International Symposium on Field-Flow Fractionation FFF '99**, September 6 - 8, 1999, Paris, France.
150. Chalmers, J.J. Zborowski, M., Lasky, L. Exploitation of Immunomagnetic Labeling, Rapid Cell Sorting and Fractionation, **Biochemical Engineering XI**, Salt Lake City, UT, July 25-30, 1999.
151. Chalmers, J.J., Gregoriades, E., Clay, J., Koelling, K.Taticek, R. Scale-up of animal cell culture bioreactors based on local energy dissipation. **217th ACS National Meeting**, Anaheim, CA, March 21-25, 1999.

152. Chalmers, J.J., Moore, L., Zborowski, M., McCloskey, K., Zhao, Y., Theoretical and Experimental Measurements of the Distribution of Cell Surface Markers Densities Using Immunomagnetic Colloids (Nanometer Scale), **Annual AIChE Meeting**, Miami Beach, Fl. November 15-20, 1998.
153. Frink, P., Cox, K.R., Chalmers, J.J. Impact of Media Phase Microstructuring on Intercellular Interactions, **Annual AIChE Meeting**, Miami Beach, Fl. November 15-20, 1998.
154. Sun, L., Moore, L., Zborowski, M., Chalmers, J.J., Rapid Cell Isolation by Magnetic Flow Sorting Using Immunomagnetic Labels in the Nanometer Scale. **Annual AIChE Meeting**, Miami Beach, Fl. November 15-20, 1998.
155. Chalmers, J.J., Haam, S., Zhou, Y., McCloskey, K. Moore, L., Zborowski, M. Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Cellular Hydrodynamic Diameter and Magnetic Susceptibility **214th ACS National Meeting,** Boston, August 22- 27, 1998.
156. Zborowski, M, Moore, L.R., Sun, L, Chalmers, J.J. Rapid Cell Isolation by Magnetic Flow Sorting for Tissue Engineering, **Annual Meeting of ASAIO**, New York, New York, April 23-24, 1998.
157. Zborowski, M, Moore, L.R., Sun, L, Chalmers, J.J., "Fast Cell separation with immunomagnetic colloid and flow-through magnetic sorter", **Cell Culture Engineering VI, Engineering Foundation Conference**, San Diego, CA, Feb. 7-12, 1998.
158. Chalmers, J.J., Haam, S., Zhou, Y., McCloskey, K. "Quantification of Cellular Properties from External Fields and Resulting Induced Velocity: Cellular Hydrodynamic Diameter and Magnetic Susceptibility" **Cell Culture Engineering VI, Engineering Foundation Conference**, San Diego, CA, Feb. 7-12, 1998.
159. Sun, L., Zborowski, M, Moore, L.R., Chalmers, J.J. " Flow Through, Immunomagnetic Cell Separation", **Cell Culture Engineering VI, Engineering Foundation Conference**, Feb. 7-12, 1998.
160. Clay, J., Gregoriades, E., Koelling, K., Chalmers, J.J., "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors", **Annual AIChE Meeting**, San Francisco, CA, November 16-21, 1997.
161. Zborowski, M, Moore, L.R., Sun, L, Chalmers, J.J., "Fast cell sorting in a novel, flow-through quadrupole magnetic field separator", **10th Symposium Molecular Biology of Hematopoiesis and Treatment of Leukemia and Lymphomas**, Hamburg, Germany, July 2-6, 1997.
162. Moore, L., Sun, L., Zborowski, M., Chalmers, J.J. "High Throughput Separation based on Cell Surface Marker Density or Surface Marker Affinity", **213th ACS National Meeting**, San Francisco, CA, April 13-17, 1997.
163. Gregoriades, E., Clay, J., Koelling, K., Chalmers, J.J., "Local Energy Dissipation and Shear Sensitive Cells in Bioreactors", **213th ACS National Meeting**, San Francisco, CA, April 13-17, 1997.
164. Chalmers, J.J., Vir, R., "Characterization of Biodegradation of Organic Compounds on a Micron-Scale. **Annual AIChE Meeting**, Chicago, IL, November 10-15, 1996.
165. Bauer, T, Rathman, J., Chalmers, J.J., "Foaming and Interfacial Phenomena in Microcarrier Suspensions. **Annual AIChE Meeting**, Chicago, IL, November 10-15, 1996.
166. Zborowski, M., Kan, M., Chen, G-H, Moore, L.R., Green, R., Chalmers, J.J. "Lymphocyte Subpopulation Analysis by Immunomagnetic Deposition", **25th Meeting of the International Society for Experimental Hematology**, August 23-27, 1996.
167. Zborowski, M., Chalmers, J.J. "Physics of Magnetic Cell Sorting", **Scientific and Clinical Applications of Magnetic Carriers**, Rostock, Germany Sept. 5-7, 1996.
168. Zborowski, M., P. Williams, Sun, L, Moore, L.R., Chalmers, J. "Free-Flow Magnetic Cell Sorting in Axially-Symmetric Split Column" **Flow Field Fractionation 96**, Ferraro, Italy.
169. Zborowski, M., Moore, L.R., Sun, L., Chalmers, J. "Continuous Flow Magnetic Cell Sorting", **ESAO '96**, 1996, Warsaw, Poland.
170. Chalmers, J.J., Zborowski, M. "Continuous Magnetic Cell Separation", **Whitaker Foundation Conference**, Snowbird UT, 1996.
171. Zborowski, M., Moore, L.R., Reddy, S., Chen, G.H., Sun, L., Chalmers, J. "Magnetic Flow Sorting Using a Model System of Human Lymphocytes" **ASAIO**, Washington, D.C., May 3, 1996.
172. Reddy, S., L. Sun, L. Moore, B. Fuh, J. J. Chalmers, "Design Considerations in Continuous Magnetic Cell Separation", **Annual AIChE Meeting**, Miami Beach, FL, November 12-17, 1995.
173. Chalmers, J.J., D. Tseng, M. Agarwal, R. Vir, Quantification of Biodegradation using FTIR", **Annual AIChE Meeting**, Miami Beach, FL, November 12-17, 1995.
174. Hancock, L., J. Chalmers, "Effect of Gas Sparging on Microcarrier Animal Cell Cultures" **American Chemical Society National Meeting**, Anaheim, CA, April 2-6, 1995.
175. Venkat, R., R. Stock, L. Hancock, J. Chalmers, "Comparison of the Hydrodynamics in a 500 ml Spinner Flask, a 2L Bioreactor, and a 20 L Bioreactor with Respect to Microcarrier Culture", **Annual AIChE Meeting**, San Francisco, CA, Nov. 13-28, 1994.

176. Chattopadhyay, D., J.J., Chalmers, "Study of the Influence of Protective Additives on the Interfacial Tensions between the Cell and the Surroundings" **Annual AIChE Meeting**, San Francisco, CA, Nov. 13-28, 1994.
177. Reddy, S., L. Moore, M. Zborowski, J. Chalmers, "Determination of the Magnetic Susceptibility of Labeled Cells by Video Imaging for Applications to Magnetic Cell Sorting" **Annual AIChE Meeting**, San Francisco, CA, Nov. 13-28, 1994.
178. Tseng, D., M. Agarwal, J. Chalmers, "Development of a Bench-Scale Bioreactor for Composting Study", **Annual AIChE Meeting**, San Francisco, CA, Nov. 13-28, 1994.
179. Fuh, B., L. Moore, J. J. Chalmers, M. Zborowski, "Magnetically Facilitated Cell Separation" **Cell Culture Engineering IV, Engineering Foundation Conference**, March 7-12, 1994.
180. Chattopadhyay, D., J. Rathman, J. J. Chalmers, "Relationship Between Cell Damage, Cell Additives, and Cell Adhesion to Gas-Liquid Interfaces", **American Chemical Society Spring Meeting**, San Diego, CA, March 13-18, 1994.
181. Venkat, R., R.L. Stock, R. S. Brodkey, Y. G. Guezennec, J. J. Chalmers, "Experimental determination of local energy dissipation and scale-up criterion in microcarrier bioreactors", **American Chemical Society Spring Meeting**, San Diego, CA, March 13-18, 1994.
182. Chalmers, J.J., R. Venkat, R. S. Brodkey, Y. Guezennec, "The Use of Three-Dimensional Particle Image Velocimetry (3D-PIV) to Characterize the Hydrodynamics Forces on Anchorage Dependent Mammalian Cells", **Annual AIChE Meeting**, St. Louis, MO, Nov. 7-12, 1993.
183. Tseng, Y., J.J. Chalmers, "Biodegradation of Organic Materials in Solid Wastes", **Annual AIChE Meeting**, St. Louis, MO, Nov. 7-12, 1993.
184. Garcia-Briones, M.A., J.J. Chalmers, "Analysis of Hydrodynamic Information Obtained from Computer Simulations of the Rupture of a Gas Bubble in Relation to Animal Cell Damage in Sparged Bioreactors", **Annual AIChE Meeting**, St. Louis, MO, Nov. 7-12, 1993.
185. Garcia-Briones, M.A., J.J. Chalmers, "Analysis of Hydrodynamic Information Obtained from Computer Simulations of the Rupture of a Gas Bubble in Relation to Animal Cell Damage in Sparged Bioreactors", **3rd International Conference on Bioreactor & Bioprocess Fluid Dynamics**, Robinson College, Cambridge UK, Sept. 14-16, 1993.
186. Venkat, R.V., R. S. Brodkey, Y.G. Guezennec, J.J. Chalmers, Experimental determination of local hydrodynamic information in microcarrier culture spinner flasks, **3rd International Conference on Bioreactor & Bioprocess Fluid Dynamics**, Robinson College, Cambridge UK, Sept. 14-16, 1993.
187. Trinh, K., M. Garcia-Briones, J. Chalmers, "Quantification of Cell Damage as a Result of Bubble Rupture," **Annual AIChE Meeting**, Miami Beach, FL, Nov. 1-6, 1992.
188. Venkat, R., R. Brodkey, J. Chalmers, "Quantification of the Hydrodynamic Forces on Suspended, Anchorage Dependent Cells," **Annual AIChE Meeting**, Miami Beach, FL, Nov. 1-6, 1992.
189. Chattopadhyay. D., R. Rathman, F. Hink, J. Chalmers, "Determination of the Mechanism of Non-Specific Cell Adhesion to Gas-Liquid Interfaces," **Annual AIChE** Meeting, Miami Beach, FL, Nov. 1-6, 1992.
190. Chalmers, J.J., M. Garcia-Briones, D. Chattopadhyay, "Mechanisms of Cell Damage as a Result of Sparging and Rational Criteria for Designing Medium to Prevent Damage," **Engineering Foundation Conferences, Cell Culture Engineering III,** Palm Coast, FL, Feb. 2-7, 1992.
191. Garcia-Briones, M., J. Chalmers, "Cell Interactions with Rupturing Gas Bubbles," **Annual AIChE Meeting**, Los Angeles, CA Nov. 17-22, 1991.
192. Chalmers, J.J., Bavarian, F., L.S. Fan, "Microscopic Visualizations of Cell-Bubble Interactions," **Annual AIChE Meeting**, Chicago, CA, Nov. 12-15, 1990.
193. Chalmers, J.J., Y. Bae, S. Goldblum, W.F. Hink, "Protective Effect of Methylcellulose-Derived Compounds on Suspended Cultures of Insect Cells," **ACS Meeting,** Boston, MA April 22-27, 1990.
194. Chalmers, J.J., Goldblum, S. and Bae, Y., "The Effect of Well Defined Laminar Shear Stress on Suspended Insect Cells and The Protective Effects of Methylcellulose Derived Compounds," **Cell Culture Engineering II, Engineering Foundation**, Santa Barbara, CA, December 3-8, 1989.
195. Chalmers, J.J., Goldblum, S. and Bae, Y., "The Long Term Effect of Constant, Well-Defined Laminar Shear Stress on Suspended Cells," **Annual AIChE Meeting**, San Francisco, CA, Nov. 5-10, 1989.
196. Chalmers, J.J., Y. Bae, R. Brodkey and W.F. Hink, "Microscopic Observations of Cells Subjected to Various Levels of Shear Stress," **Annual AIChE Meeting,** Washington, DC, Nov. 27-Dec. 2, 1988.
197. Chalmers, J.J., M.L. Shuler and D.B. Wilson, "Studies on the Continuous Production and Excretion of a Plasmid Encoded Protein from *Escherichia coli,* **First Annual Ohio state Biotechnology Conference**, March 24-25, 1988, Columbus, OH.

198. Chalmers, J.J., G. Georgiou, M.L. Shuler and D.B. Wilson, "Effect of Environment on Genetic Stability and Protein Excretion in *E. coli,"* **Annual AIChE Meeting**, Miami Beach, FL, Nov. 2-7, 1986.
199. Chalmers, J.J., M.L. Shuler and D.B. Wilson, "Bioreactors for Continuous Production and Excretion of Plasmid-Encoded Protein from *E. coli*," **Cornell Biotechnology Symposium**, Oct. 21-22, 1986.

M.S. Advisor

Student	Date	Thesis Title
Bogoevski, Daniel	1989	The Effect of Glucose Concentration on the Production of Plasmid-Encoded Proteins in *Escherichia-coli*
Bae, Yong Kook	1989	Studies about Shear Stress Effects on *Trichoplusia ni* Insect Cells
Goldblum, Seth	1990	Characterization of the Protective Effects of Methylcellulose and other Polymers on Insect Cells Subjected to Laminar Shear Stress
Venkat, Raghavan	1991	Protein Phosphorylation Studies of Human Vascular Endothelium as a Response to Shear and Simulations of Complex Arterial Flows in a Simple Parallel Flow Viscometer System
Tzeng, Yi	1991	The Influence of Acetate on The High Cell Density Fermentation of *Escherichia coli*
Garcia-Briones, Miguel	1992	Computer Simulations of the Bubble Breakup at a Gas-Liquid Interface and its Implications in Animal Cell Damage in Large Scale Cultures
Trinh, Kim	1992	Quantification of Cell Damage as a Result of Bubble Rupture
Moore, Lee	1994	Continuous, Magnetic Cell Separation
Von Fahnestock, Mike	1994	Characterization of a Large Scale, In-Vessel Composting System
Hancock, Lorinda	1995	Effect of Environmental Conditions on Animal Cell Microcarrier cultures
Wheeler, Glen	1995	Supercritical extraction and biodegradation of phenolic compounds
Agarwal, Mukul	1995	Studies on the degradation of a biodegradable plastic
Rahul Vir	1996	Characterization of Non-submerged biofilms
Chen, Gho-Ha	1996	Quantification of an immunomagnetic cell deposition system
Bauer, Patricia	1996	The Effect of Surfactant Type and Concentration on Animal Cell Culture
Niki Gregoriades	1997	Characterization of Suspended and Anchorage dependent cell damage in a extensional flow device
Cesar Mauras	1997	Quantification of Biofilms using Confocal Microscopy and Image Analysis
Angela Younger	1999	The Effect of Surfactants on Animal Cells
Camella, Kristin	2001	Immunomagnetic Separations: Effects of Antibody Concentration, Effects of Antibody Concentration, and Quantitation of Antibody Binding Capacity.
Richardson, Aaron	2002	Cell Tracking Velocimetry (CTV): System Comparison Studies and Electromagnetic Integration
Garcia-Villa, Alejandra	2012	Assesment of γ-H2AX levels in circulating tumor cells enriched by negative immunomagnetic selection

Ph.D. Advisor

Student	Date	
Garcia-Briones, Miguel	1994	Quantification of the Hydrodynamics Forces on Suspended Cells in Bioreactors
Chattopadhyay, D.	1995	Thermodynamic Studies of Cell Adhesion to Gas-Liquid Interfaces
Tzeng, Yi	1995	Kinetic Studies of the Composting Process
Venkat, Raghavan	1995	Quantification of the Hydrodynamics Forces on Anchorage Dependent Animal Cells in Turbulent Bioreactors
Sun, Liping	1998	Immunomagnetic cell separation
McCloskey, Kara	2001	Theoretical and Experimental Characterization of Magnetophoretic mobility
Ma, Ninging	2002	Quantitative study of Bubble-Cell Interaction and the Mechanism of Mammalian Cell Damage from Hydrodynamic Forces
Lara, Oscar	2003	Immunomagnetic Cell Separations: Further Application of the Quadrupole Magnetic Cell Sorter
Mollet, Mike	2004	Physiological Effects of Hydrodynamic Forces on Animal Cells

Zhang, Huading	2004	Immunomagnetic cell separation: continued development of mathematical model of magnetopheric mobility and further applications
Shao, Mei	2005	Creation and Depletion of Alloreactive T-cells for Bone Marrow transplants
Mehta, Bhavya	2006	Optimization of Methodologies to digest tumor tissue
Jing, Ying	2006	Enrichment of Pluripotent Stem Cells
Hu, WeiWei	2006	Prevention of Damage to Algae cells in Commercial Bioreactors
Liying,Yang	2007	Application of Immunomagnetic Cell Separation in Cancer Cell Detection: Development and Optimization
Shenkman, Rustin	2008	Magnetic Separation of Islets
Xiong, Ying	2008	Generation and separation of Alloreactive T-cells
Godoy, Ruben	2008	Lethal and Sub-Lethal Effects of Hydrodynamic Forces on Animal cell Culture
Xiaoxia, Jin	2009	Investigation of Intrinsic Cell Magnetophoresis for Label-less Cell Separation and Analysis and the Optimization of the CTV Instrumentation for such Studies
Berdugo, Claudia	2010	Cell Damage Mechanisms and Stress Response in Animal Cells Cultures
Jianxin Sun	2010	Intrinsic Magnetism of *Bacillus* Spores: Theoretical Studies and Potential Applications
Balasubraman, Priya	2010	Characterization and significance of circulating tumor cells in patients obtained using a negative selection technology
Xu, Jie	2012	Labeled and Label-less Magnetic Cell Separation and Analysis using Cell Tracking Velocimetry
Miller, Brandon	2013	Quantitative, Multiparameter Analysis of Fluorescently Stained, Negatively Enriched, Peripheral Blood from Cancer Patients
Wu, Youngy	2014	Multi-parameter Fluorescent Analysis of Magnetically Enriched Circulating Tumor Cells.
Deighan, Clayton	2015	Particle Balances in Therapeutic Extracellular Vesicle Development and in Depth Characterization of Fluorescence Nanoparticle Tracking Analysis
Xue, Wei	2016	Measurements of Cellular Intrinsic Magnetism with Cell Tracking Velocimetry and Separation with Magnetic Deposition Microscopy
Amaya, Peter	2017	A Multiparameter Approach to Separation and Clonal Analysis of Mammalian Cells
Kyoung-Joo, Jenny Park	2017	Multi-Parameter Fluorescent Analysis and Quantitative Magnetophoresis Study as Two Different Technologies to Detect and Characterize Cells and Its Various Applications as Biomarkers
Kim, James	2020	The study of animal cells through combination of numerical analysis and various magnetic microfluidic systems
Plencer, Eric	2022	Stress response of continued intensification of industrial production processes
Weigand, Mitch	2022	Characterization and Separation of Human Erythrocytes Through the use of Permanent Magnets and Chemical Treatments
Wu, Xian	current	
Strayer, Jacob	current	
Cho, Heyon	current	

Undergrad Honors Thesis

Casandra Foltz	1995	3-D particle tracking of a 250 spinner vessel in a moving frame of reference
Todd Gibson	2000	Performance Evaluation of the Separation of HER-2/neu Cells with the Magnetic Cell Sorting Batch System
Keith Decker	2001	Flow Splitter Distortions and Cell Crossover in the Quadrupole Magnetic Flow Sorter (QMS)
Serra Elliot	2009	Cell Damage due to Hydrodynamic Stress in Fluorescence Activated Cell Sorters

Post-Doctoral Advisor

Reddy, Shirdar	1994 -1996	development of Cell Tracking Velocimetry
Nakamura, M.	1999 -2002	magnetic cell separation technology
Tong, Xiaodong	2003 –2007	magnetic cell separation technology
Lara, Oscar	2003 – 2004	magnetic cell separation technology
Zhao, Yang	2002 – 2011	CTV programming
Claudia Berdugo	2010- 2010	Cell Damage Mechanisms and Stress Response in Animal Cells Cultures
Jenifer Gomez-Pastora	2018-2022	Magnetic Cell Separation

Research Associates

Melnik, Kristie	2000 - 2002; 2004 - 2006
Chosy, Julia	2000 - 2002

Courses Taught

Chemical Engineering Process Design (Chem E. 764; Experimental Cell Culture class (Chem E. 793); Mass and Energy balances (Chem. Eng. 200, 201); Heat transfer (Chem. E. 521), Kinetics (Chem. E. 610), Biochemical Engineering (Chem. E. 666, 766), Product Design (Chem. E. 762), Novel Separations: Bioseparations (Chem E 733), Graduate Heat Transfer (Chem. E. 815.05) Graduate Kinetics (Chem. E. 812)

University Committees

Search Committee member, Associate Vice President for Technology Transfer and Commercialization
Admission Committee, Ohio State Biochemistry Program
Ad Hoc Committee on Environmental Sciences and Engineering

College Committees

College of Engineering Core Curriculum Committee (2005-2006, 2006-2007, 2007-2008,)
College of Engineering Intellectual Property Advisory Committee, (2003 -)
Chair, College of Engineering Committee on Academic Affairs (2001-2002; 2002-2003, 2012-2013)
College of Engineering Committee on Academic Affairs (1992-)
College of Engineering Course Proposal Sub-Committee
College of Engineering Promotion and Tenure Committee, (02-03; 03-04)
Graduate Studies Committee, Biomedical Engineering Center
Chair, College of Engineering Chemistry Liaison Committee

Department Committees

Chair, Promotion and Tenure Committee (2003-)
Seminar Committee, 1988-1996
Special Events Committee, 1988-present
Curriculum and Accreditation, 1991-present
Computer, 1992-1995
Space and Facilities, 1991-present
Library, 1990-1995
Graduate Student Liaison, 1992-1996