

CURRICULUM VITÆ

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Biographical Information:

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Educational Background:

1996 Ph.D. (Physiology & Biophysics), Case Western Reserve University, Cleveland, OH, U.S.A.
1990 M.Sc. (Experimental Surgery), Dean's Honors List McGill University, Montréal, Québec, Canada
1984 Permanent ECFMG certificate, Foreign Medical Graduate Examination in the Medical Sciences (F.M.G.E.M.S.)
1984 M.D. (Doktor der gesamten Heilkunde, Dr. med. univ.), School of Medicine, Leopold Franzens Universität, Innsbruck, Austria

Professional Experience:

2016 – present Associate Director, Case Center for Multimodal Evaluation of Engineered Cartilage, Case Western Reserve University, Cleveland, OH
2007 – present Research Associate Professor, Department of Biology, College of Arts and Sciences, Case Western Reserve University, Cleveland, OH
2012 – present Research Associate Professor, Center for Regenerative Medicine, School of Medicine, Division of General Medical Sciences, Case Western Reserve University, Cleveland, OH (*Secondary Appointment*)
2004 – 2007 Senior Research Associate, Skeletal Research Center Case Western Reserve University, Cleveland, OH
1998 – 2004 Assistant Professor, Department of Orthopædics, Case Western Reserve University, Cleveland, OH
1996 – 1998 Instructor, Department of Orthopædics, Case Western Reserve University, Cleveland, OH
1990 – 1996 Ph.D. Candidate, Department of Physiology & Biophysics, Case Western Reserve University, Cleveland, OH. Advisor: Dr. Richard L. Eckert.
1989 – 1990 Post-Doctoral Fellow, Department of Orthopædics,

	Case Western Reserve University, Cleveland, OH. Advisors: Drs. John Shaffer and Victor M. Goldberg
1988 – 1989	PGY-1 Surgery Resident, Surgery Residency Program, Case Western Reserve University, Cleveland, OH
1985 – 1988	Research Fellow, Montreal Children's Hospital Research Institute (Orthopaedic Research Laboratory), Montréal, PQ, Canada. Advisor: Dr. Kenneth L.B. Brown

Professional Affiliations:

2010 – present	Tissue Engineering & Regenerative Medicine International Society
2008 – present	Osteoarthritis Research Society International
2007 – present	Biomedical Engineering Society
2003 – present	International Cartilage Repair Society
2001 – present	American Society for Bone and Mineral Research
1998 – present	American Society for Biochemistry & Molecular Biology
1997 – 2014	Orthopaedic Research Society
1989 – present	American Association for the Advancement of Science

Honors and Awards:

2006	ICRS poster award “ <i>Cum Laude</i> ”
2003, 2005	Arthritis Foundation travel award
1991 – 1993	Research Fellowship, Cell Physiology Training Program. Department of Physiology & Biophysics, Case Western Reserve University, Cleveland, OH
1990	McGill University, Dean's Honors List
1989 – 1990	Research Fellowship, NIH Training Program in Musculoskeletal Research. Department of Orthopaedics, Case Western Reserve University, Cleveland, OH
1985 – 1988	Fellow of the McGill University – Montreal Children's Hospital Research Institute

Teaching and Advising Experience:

High school

2019	Cheyenne Jones, Hathaway Brown, student advisor
2013	Jake Althans, Gilmour Academy, student co-advisor
2012	Sarah Abdalian, Gilmour Academy, student co-advisor

Undergraduate

2018 – 2019	Kareem Akabashoroun, work study student/web assistant
2017	Hanna Chan, undergraduate project co-advisor (MAE)
2014 – 2016	Joe Heebner, undergraduate project co-advisor (MAE)
2013 – 2016	Joe Heebner, ENGAGE fellowship sponsor (MAE)

2011	Di-Win (Marine) Gu, undergraduate senior project co-advisor (MAE)
2011	Eduardo Arellano, summer laboratory project co-advisor (MAE)
2010 – 2011	Marcin Citak, undergraduate senior project co-advisor (MAE)
2010	Jason Walker, undergraduate senior project co-advisor (MAE)
2009	Jason Walker, summer laboratory project co-advisor (MAE)
2009	Michal Pelyak, ENGAGE fellowship sponsor (Biol)
2009	Michael Pelyak, Biol. 388 co-advisor (Biol)
2009	Ashley McKee (Myers), undergraduate senior project co-advisor (BME)
2008	Michael Pelyak, ENGAGE fellowship sponsor (Biol)
2006 – 2011	EBME 325, Introduction to Tissue Engineering, guest lecturer. (BME)
2005 – 2006	Ross Anderson, undergraduate senior project co-advisor (Phys)
2002	Rabia Ahmed, summer undergraduate student.

Graduate

2020 – present	Bo Zhang, Ph.D. thesis committee member (BME)
2014 – 2020	Yi Zhong, MSc guidance committee member (BME)
2009 – present	Thesis committees for MS in Entrepreneurial Biotechnology Program. (All Biol): Shiv Shanmugan, Vinay Sethia, Pavan Sethia, Balambal Subramanian, Hong Wang, JT Tan, Rohit Davis, Shivam Barathi, Colin Naples, Mike Hallen, Ryan Allison, Randall Hoyle, Terrence Yen, Allison Trouten, Matteo Nee, Dhvani Jasmin Valia.
2016 – 2019	Haitao Liu, Ph.D. thesis committee member (Biol)
2013 – 2018	Kuo-Chen (May) Wang, Ph.D. thesis committee member (Biol)
2013 – 2017	Mousa Younesi, Ph.D. thesis committee member (MAE)
2014	Chen-Yuan Chung, Ph.D. thesis committee member (MAE)
2012 – 2014	Alexander (Lee) Rivera, Ph.D. thesis committee member (ChE)
2012 – 2013	Mostafa Motavalli, Ph.D. thesis committee member (MAE)
2012 – 2013	Di-Win (Marine) Gu, M.Sc. co-advisor and committee member (MAE)
2009 – 2013	Chi-Ling (Kate) Chou, Ph.D. thesis committee member (ChE)
2008 – 2011	Ph.D. thesis committee for Wan-Hsiang (Rachel) Liang (BME)
2006 – 2011	Wan-Hsiang (Rachel) Liang Ph.D. thesis committee member (ChE)
2003	ECHE 474 Biotransport Processes. Helped with the development of the course.
1991 – 1994	Introduction to Microcomputers. Department of Physiology & Biophysics, CWRU

Fellows

2016 – present	Mostafa Motavalli, Ph.D., Postdoctoral Fellow
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2014 – present	Johnathan Kenyon, Ph.D., Postdoctoral Fellow
2003 – 2004	Mukund Deglurkar, M.B.B.S., M.S., F.R.C.S., Research Fellow, MD candidate, University of Wales
2003 – 2004	Reid Wenger, D.D.S., Research Fellow
1997 – 1998	Shmuel Tsurel, M.D.; Research Fellow

Other

2005 – 2009	Bioreactors for Cartilage Tissue Engineering; Optimizing MSC differentiation; “Cell-Based Therapies and Tissue Engineering” (CTTE) short course
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Ongoing Collaborations:**At Case Western Reserve University:**

Russel Wang, D.D.S, M.S.D.:	PEEK for maxillofacial reconstruction
Andrew Rollins, Ph.D.:	Optical coherence tomography of cartilage
Thomas Hostetter, M.D.:	Compensatory renal growth.
Xiong (Bill) Yu, Ph.D.:	Smart tooth platform.
David Prologo, M.D.:	Intervertebral disc MSC injections.
Ozan Akkus, Ph.D.:	Osteochondral tissue engineering.
Joseph Mansour, Ph.D.:	Mechanical and ultrasound evaluation of hydrogels, native and engineered tissue.
Arnold Caplan, Ph.D.:	Mesenchymal stem-cell based cartilage tissue engineering.
Davood Varghai, M.D.:	Cranial explant organ culture.
Harihara Baskaran, Ph.D.:	Cartilage tissue engineering, contact guidance, mass transport studies in tissue-engineered cartilage and skin, metabolic engineering of anaerobic bacteria. Optode sensor development
Eben Alsberg, Ph.D.:	Scaffolds for cartilage tissue engineering.
Charles Malemud, Ph.D.:	Apoptosis in OA.
Zhenghong Lee, Ph.D.:	Real-time imaging of MSC differentiation by bioluminescence. miRNA probe validation for differentiation monitoring. Online MR/PET imaging of tissue-engineered cartilage.
C.C. Liu, Ph.D.:	Glucose consumption by differentiating mesenchymal stem cells. Electronic ELISA, CRISPR/Cas based biosensors

Off Campus:

Tariq Haqqi (Neomed):	Role of a neogene RTL3 in cartilage health and disease
Tom Bollenbach, Richard McFarland, MaryClare McCorry (ARMI BioFabUSA):	Establishment of <i>Center for Modular Manufacturing of Structural Tissues</i>
Maxim Budyanski (Avitus Orthopedics):	Evaluation of novel bone curetting tool
MaryBeth Wandel and John Ragsdell (Cook Medical):	Acoustic evaluation of hydrogels

Riccardo Gottardi (Pittsburgh):	Mechanically active bioreactors
Pete Alexander (Pittsburgh):	Osteochondral tissue engineering
Lisa Freed (MIT) and Farshid Guilak (Washington U.):	Osteochondral tissue engineering
Hülya Bükülmez, M.D.(MetroHealth):	Role of CNP in MSC differentiation.
Olcay Jones (Walter Reed):	MSCs in Lupus and Rheumatoid Arthritis
David Dean (Ohio State):	Tissue engineering of cranial implants
Tracey Richey and Mark Smith (Oakwood Labs):	Sustained-release intra-articular drug delivery
H. Michael Cheung (U. of Akron):	Dynamic light scattering in molecular crowding.
John Robecheck, (Sensirox, Inc), and Jay Johnson (UDRI):	Development of micro-pH sensors.
R. Tracy Ballock, (CCF):	Investigation of Heuter-Volkman effect <i>in vitro</i> using a hydrostatic bioreactor.
Dwayne Bisgrove, Ph.D., (System Biosciences):	Lentiviral reporter/selection vectors to report cell differentiation.

Service to Professional Community:

2020	Member, 2020-05 NIH-NIBIB P41 review panel
2017 – present	Reviewer, Science Foundation Ireland
2013 – present	Reviewer, NMRC (Singapore) Clinician Scientist Awards
2012 – present	International Expert Panel member, National Medical Research Council (Singapore).
2013	<i>Ad hoc</i> member, NIH Cell Culture Bioreactor Study Section ZRG1 IDM-M (30)
2012	Member, NIH COBRE renewal review panel
2011	Study section member for Arthritis Research UK
2010, 2011	Reviewer, NCRM pilot grant proposals
2009	Moderator, Progenitors and Stem Cells session, Orthopaedic Research Society meeting, Las Vegas, NV
2009	Member, NIH Challenge Grant Review Panel #10, ZRG1 BDA-A (58) R
2008	Member, Arthritis Research Campaign (U.K.) study section
2008	Member, Special Emphasis Panel/Scientific Review Group 2009/01 MTE
2008	<i>Ad hoc</i> member, NIH Special Emphasis Panel/Scientific Review Group ZAR1 EHB-H (M1) 1
2006, 2007	<i>Ad hoc</i> member, NIH Special Emphasis Panel/Scientific Review Group ZAR1 EHB-J (M1) (1)
2005	<i>Ad hoc</i> member, NIH Special Emphasis Panel/Scientific Review

	Group ZAR1 EHB-G (O1) (1)
2005	Judge, MTEC-2005 presentation awards
2004, 2006 – 2012	<i>Ad hoc</i> reviewer for the National Medical Research Council (Singapore) study section
2004, 2006, 2007	Judge, graduate student poster competition at Research ShowCASE
2003	Organizing committee for the 5 th Bone Fluid Flow Workshop, Cleveland, OH. September 17 – 18.
2002 – 2003	<i>Ad hoc</i> member, NIH biomedical engineering study section ZRG1 SSS-M 58
2001 – 2004	Member, Department of Orthopaedics Research Committee, CWRU

- Editorial board member *Stem Cell-Fundamentals and Practice*
- *Ad hoc* reviewer for *Acta Biomaterialia*
- *Ad hoc* reviewer for *Annals of Biomedical Engineering*
- *Ad hoc* reviewer for *Archives of Biochemistry and Biophysics*
- *Ad hoc* reviewer for *Arthritis Research and Therapy*
- *Ad hoc* reviewer for *Biomaterials*
- *Ad hoc* reviewer for *BioTechniques*
- *Ad hoc* reviewer for *Biotechnology & Bioengineering*
- *Ad hoc* reviewer for *BMC Cell Biology*
- *Ad hoc* reviewer for *Bone*
- *Ad hoc* reviewer for *British Journal of Cancer*
- *Ad hoc* reviewer for *Cells, Tissues, Organs*
- *Ad hoc* reviewer for *Current Eye Research*
- *Ad hoc* reviewer for *Future Medicine*
- *Ad hoc* reviewer for *Genomics*
- *Ad hoc* reviewer for *International Journal of Materials Sciences*
- *Ad hoc* reviewer for the *Journal of Biological Chemistry*
- *Ad hoc* reviewer for the *Journal of Biomedical Materials Research*
- *Ad hoc* reviewer for *Journal of Biotechnology*
- *Ad hoc* reviewer for the *Journal of Investigative Dermatology*
- *Ad hoc* reviewer for the *Journal of Orthopaedic Research*
- *Ad hoc* reviewer for *Journal of Functional Morphology and Kinesiology*
- *Ad hoc* reviewer for the *Orthopaedic Research Society*
- *Ad hoc* reviewer for the *Osteoarthritis and Cartilage*
- *Ad hoc* reviewer for *Processes*
- *Ad hoc* reviewer for *Regenerative Medicine*
- *Ad hoc* reviewer for *TERMIS-NA meeting*
- *Ad hoc* reviewer for *Tissue Engineering*
- *Ad hoc* reviewer for *Yonsei Medical Journal*

Departmental Service:

2019 – present		Webmaster for Case Western Reserve University <i>Center for Modular Manufacturing of Structural Tissues</i> web site. (http://case.edu/cm2ost)
2012 – present		Webmaster for Case Western Reserve University Center for Multimodal Evaluation of Engineered Cartilage web site. (http://ccmeec.cwru.edu)
2010 – present		Webmaster for Case Western Reserve University annual <i>Business Education Course</i> . (http://www.case.edu/entrepreneurship/regen_med)
2010 – present		Judge, Michaelson-Morley Research Competition, Department of Biology
2010 – present		Webmaster for Case Western Reserve University annual <i>CTTE short course</i> web site: (http://case.edu/cttecourse)
2008 – present		Webmaster for Case Western Reserve University <i>Skeletal Research Center</i> web site: (http://www.case.edu/artsci/biol/skeletal)
2004 – present		IT maintenance and support for the Skeletal Research Center

Community Service:

2014	Web site design for <i>DLS Tournament</i> bowling league (http://www.dlstournament.com)
2013	Revised web site for <i>InFocus of Cleveland Inc.</i> ,
2010	Prototyped web site for <i>InFocus of Cleveland Inc.</i> , an operator of group homes for at-risk youths (http://www.infocusofcleveland.com)

Publications:

(Students' and advisees' names are underlined)

Patents:

1. Mansour, J.M.; Motavalli, M.; and **Welter, J.F.**: Method to rapidly detect shear-induced damage in tissue engineering cartilage, Provisional patent application number 62/539,793 filed August 2017.
2. Holt, V.; **Welter, J.F.**; Berilla, J.A.; Harris, M.; and Caplan, A.I.: Cell capture apparatus and staining device. Provisional patent application number 61/875918 filed September 10, 2013.
3. **Welter, J.F.**; Solchaga, L.A.; Berilla, J.A.; and Penick, K.: Apparatus and method for tissue engineering. US Patent # 8,507,266 issued August 13, 2013.

Manuscripts Submitted or in Preparation:

1. Zhong, Y.; Somoza, R.A.; Caplan, A.I.; **Welter, J.F.**; and Baskaran, H.: Amino acid metabolism and requirements during human mesenchymal stem cell chondrogenesis. *Stem Cells Translational Medicine*. 2020 (*submitted*).
2. Motavalli, M.; **Welter, J.F.**; Berilla, J.A.; Margevicius, S.; and Mansour, J.M.: Towards the feasibility of using stress wave propagation to characterize the relative tensile and compressive mechanical properties of articular cartilage. *Physics in Medicine and Biology*. 2020 (*in revision*)

3. Prologo, J.D.; Duesler, L.; Berilla, J.A.; Baskaran, H.; and **Welter, J.F.**: Effects of high-pressure injection on MSC viability and differentiation. *Journal of Vascular and Interventional Radiology* 2015 (*resubmitted*)
4. Holt, V.; Berilla, J.A.; Harris, M.; Caplan, A.I.; and **Welter, J.F.**: A cell capture apparatus and staining device for buoyant cells. (*in preparation*)
5. Berilla, J. and **Welter, J.F.**: Image analysis algorithm for measuring shell thickness in engineered cartilage. (*in revision*)
6. Penick, K.J.; Solchaga, L.A.; Caplan A.I.; Goldberg, V.M.; and **Welter, J.F.**: Epitope retrieval for type X collagen detection. (*in revision*)
7. Berilla, J.; Solchaga, L.A.; Baskaran, H.; and **Welter, J.F.**: Design of a cartilage tissue engineering bioreactor. (*submitted*)
8. **Welter, J.F.**; Solchaga, L.A.; Leahy, P.; Penick, J.; Caplan, A.I.; and Goldberg, V.M.: Gene expression patterns during chondrogenic differentiation of human MSCs. (*in preparation*)
9. Solchaga, L.A.; Penick, J.; Goldberg, V.M.; Caplan, A.I.; and **Welter, J.F.**: TGF- β 1 and dexamethasone regulate hypertrophy during chondrogenic differentiation of bone marrow-derived mesenchymal stem cells. (*in preparation*)
10. Liang, W.H.; Janakiraman, V.; **Welter, J.F.**; and Baskaran, H.: Composite tissue engineered skin constructs made of collagen dermal analogs and cultured keratinocyte epidermal analogs (*in preparation*)
11. **Welter, J.F.**; Baskaran, H.; Berilla, J.A.; Caplan, A.I.; Goldberg, V.M.; Penick, K.; and Solchaga, L.A.: Transient aggregate culture enables human mesenchymal stem cell-based cartilage tissue engineering (*in preparation*)
12. **Welter, J.F.**: Simplified color thresholding of histological images using color-space rotation. (*in preparation*)

Peer-Reviewed Manuscripts:

1. Jung, H.; McClellan, P.; **Welter, J.F.**; and Akkus, O.: Chondrogenesis mesenchymal stem cells via local release of TGF β -3 from heparinized collagen biofabric. *Tissue Engineering part A* 2021, 27(21-22):1434-1445. PMID: 33827271 DOI: <https://doi.org/10.1089/ten.TEA.2020.0383>
2. Zhong, Y.; Caplan, A.I.; **Welter, J.F.**; and Baskaran, H.: Glucose availability affects extracellular matrix synthesis during chondrogenesis in vitro. *Tissue Engineering Part A*, 2021, 27(19-20):1321-1332, PMID: 33499734 DOI: <https://doi.org/10.1089/ten.TEA.2020.0144>
3. Dai, Y.; Xu, W.; Somoza, R.; **Welter, J.F.**; Caplan, A.; and Liu, C.-C.: An integrated multi-function heterogeneous biochemical circuit for high-resolution electrochemistry-based genetic analysis. *Angewandte Chemie*, 2020, 59(46): 20545 – 20551 <https://doi.org/10.1002/anie.202010648>, PMID: 32957217
4. Mansour, J.M.; Motavalli, M.; Bensusan, J.; Li, M.; Margevicius, S.; and **Welter, J.F.**: The nonlinear relationship between speed of sound and compression in articular cartilage: Measurements and modeling. *Journal of the Mechanical Behavior of Biological Materials*, 2020, 110:103923 <https://doi.org/10.1016/j.jmbbm.2020.103923>, PMID: 32952604, PMCID: PMC493830
5. Motavalli, M.; Jones, C.; Berilla, J.A.; Li, M.; Schluchter, M.D.; Mansour, J.M.; and **Welter, J.F.**: Apparatus and method for rapid detection of acoustic anisotropy in cartilage. *Journal of Medical and Biological Engineering*, 2020, 40:419 – 427. <https://doi.org/10.1007/s40846-020-00518-7>, PMID: 32494235 PMCID: PMC7268905

6. Dai, Y.; Somoza, R.A.; Wang, L.; **Welter, J.F.**; Li, Y.; Caplan, A.I.; and Liu, C.C.: Exploring the transcleavage activity of CRISPR Cas12a for the development of a universal electrochemical biosensor. *Angewandte Chemie*, 2019, 131(48):17560 – 17566. <https://doi.org/10.1002/ange.201910772>, PMID: 31568601, PMCID: PMC6938695.
7. Larson, B.L.; Yu, S.N.; Park, H.; Estes, B.T.; Moutos, F.T.; Bloomquist, C.J.; Wu, P.B.; **Welter, J.F.**; Langer, R.; Guilak, F.; and Freed, L.E.: Chondrogenic, hypertrophic, and osteochondral differentiation of human mesenchymal stem cells on three - dimensionally woven scaffolds. *Journal of Tissue Engineering and Regenerative Medicine*, 2019, 13(8):1453 – 1465. <https://doi.org/10.1002/term.2899>, PMID: 31115161, PMCID: PMC6715532.
8. Mansour, J.M.; Motavalli, M.; Dennis, J.E.; Kean, T.J.; Caplan, A.I.; Berilla, J.A.; and **Welter, J.F.**: Rapid detection of shear-induced damage in tissue engineered cartilage using ultrasound. *Tissue Engineering, Part C*, 2018, 24(8):443 – 456. <https://doi.org/10.1089/ten.tec.2017.0513>, PMID: 29999475, PMCID: PMC6088252.
9. Zhong, Y.; Motavalli, M.; Caplan, A.I.; **Welter, J.F.**; and Baskaran, H.: Dynamics of intrinsic glucose uptake kinetics in human mesenchymal stem cells during chondrogenesis. *Annals of Biomedical Engineering*, 2018, 46:1896 – 1910. <https://doi.org/10.1007/s10439-018-2067-x> PMID: 29948374, PMCID: PMC6204100.
10. Wang, K.-C.; Egelhoff, T.T.; Caplan, A.I.; **Welter, J.F.**; Baskaran, H.: ROCK Inhibition promotes development of chondrogenic tissue by improved mass transport, *Tissue Engineering Part A*, 2018, 24:1218 – 1227. <https://doi.org/10.1089/ten.tea.2017.0438> PMID: 29397789, PMCID: PMC6080111.
11. Chou, C.-L.; Rivera, A.L.; Williams, V.; **Welter, J.F.**; Mansour, J.M.; Drazba, J.A.; Sakai, T.; and Baskaran, H.: Micrometer scale guidance of mesenchymal stem cells to form structurally oriented largescale tissue engineered cartilage *Acta Biomaterialia* 2017, 60:210 – 219. PMID: 28709984, PMCID: PMC5581212.
12. Verbus, E.A.; Sergeeva, O.; Kenyon, J.D.; Awadallah, A.; Yuan, L.; **Welter, J.F.**; Caplan, A.I.; Schluchter, M.D.; Khalil, A.M.; and Lee, Z.: Expression of miR-145-5p during chondrogenesis of mesenchymal stem cells. *Journal of Stem Cell Research (Overland Park)* 2017, 1(3):1 – 10. PMID: 29721552, PMCID: PMC5926818.
13. Mishra, R.; Sefcik, R.S.; Bishop, T.J.; Montelone, S.M.; Crouser, N.; **Welter, J.F.**; Caplan, A.I.; and Dean, D.: Growth factor dose tuning for bone progenitor cell proliferation and differentiation on resorbable poly(propylene fumarate) scaffolds. *Tissue Engineering Part C, Methods* 2016, 22(9):904 – 913. PMID: 27558310, PMCID: PMC5035914.
14. Mansour, J.; Lee, Z.; and **Welter, J.F.**: Nondestructive techniques to evaluate the characteristics and development of engineered cartilage. (*Invited review*). *Annals of Biomedical Engineering* 2016, 44(3):733 – 749 PMID: 26817458, PMCID: PMC4792725.
15. Chung, C.-Y.; Heebner, J.; Baskaran, H.; **Welter, J.F.**; and Mansour, J.M.: Ultrasound elastography for estimation of regional strain of multilayered hydrogels and tissue-engineered cartilage. *Annals of Biomedical Engineering* 2015, 43(12):2991 – 2300. PMID: 26077987, PMCID: PMC4626304
16. Correa, D.; Somoza, R.; Lin, P.; Greenberg, S.; Rom, E.; Duesler, L.; **Welter, J.F.**; Yayon, A.; and Caplan, A.I.: Sequential exposure to fibroblast growth factors (FGF) 2, 9 and 18 enhances hMSCs

- chondrogenic differentiation. *Osteoarthritis & Cartilage* 2015, 23(3):443 – 53. PMID: 25464167, PMCID: PMC4692467.
17. Mansour, J.M.; Gu, D.-W.; Chung, C.-Y.; Heebner, J.; Althans, J.; Abdalian, S.; Schluchter, M.D.; Liu, Y.; and **Welter, J.F.**: Towards the feasibility of using ultrasound to determine mechanical properties of tissues in a bioreactor. *Annals of Biomedical Engineering* 2014, 42(10):2190 – 2202. PMID: 25092421, PMCID: PMC5088715.
 18. Somoza, R.; **Welter, J.F.**; Correa, D.; and Caplan, A.I.: Chondrogenic differentiation of Mesenchymal Stem Cells: unfulfilled expectations and new challenges. *Tissue Engineering, Part B* 2014, 20(6):596 – 608 PMID: 24749845, PMCID: PMC4241862.
 19. Wallace, J.; Wang, M.O.; Thompson, P.; Busso, M.; Belle, V.; Mammoser, N.; Kim, K.; Fisher, J.P.; Siblani, A.; Xu, Y.; **Welter, J.F.**; Lennon, D.P.; Sun, J.; Mikos, A.G.; Caplan, A.I.; Dean, D.: Validating continuous digital light processing (cDLP) additive manufacturing accuracy and tissue engineering utility of a dye-initiator package. *Biofabrication* 2014, 6(1):015003.
<https://doi.org/10.1088/17585082/6/1/015003> PMID: 24429508.
 20. Mansour, J.M. and **Welter, J.F.**: Multimodal evaluation of tissue-engineered cartilage. *Journal of Medical and Biological Engineering* 2013, 33(1):1 – 16. PMID: 23606823, PMCID: PMC3628734.
 21. **Welter, J.F.**; Penick, J.; Solchaga, L.A.: Assessing adipogenic potential of mesenchymal stem cells: a rapid three-dimensional culture screening technique. *Stem Cells International* 2013, Article ID 806525 PMID: 23431315, PMCID: PMC3574742.

Reprinted in *Stem Cells — Advances in Research and Application: 2013 edition*
 22. Chou, C.-L.; Rivera, A.L.; Sakai, T.; Caplan, A.I.; Goldberg, V.M.; **Welter, J.F.**; and Baskaran, H.: Micrometer scale guidance of mesenchymal stem cells to form structurally oriented cartilage extracellular matrix. *Tissue Engineering, Part A* 2013, 19(9-10):1081 – 1090. PMID: 23157410, PMCID: PMC3609643.
 23. Bükülmez, H.; Bartels, C.F.; Nanda, K.; Haqqi, T.M.; and **Welter, J.F.**: Cartilage-protective effects of C-type natriuretic peptide over expression in K/BxN TCR arthritis model. *Pediatric Rheumatology* 2012, 10(Suppl 1):A109.
 24. Shao, Y.; Wang, L.; **Welter, J.F.**; and Ballock, R.T.: Primary cilia modulate ihh signal transduction in response to hydrostatic loading of growth plate chondrocytes. *Bone* 2012, 50(1):79 – 84.
<https://doi.org/10.1016/j.bone.2011.08.033> PMID: 21930256, PMCID: PMC3246537.
 25. Walker, J.M.; Myers, A.M.; Schluchter, M.D.; Goldberg, V.M.; Caplan, A.I.; Berilla, J.A.; Mansour, J.M.; and **Welter, J.F.**: Nondestructive evaluation of hydrogel mechanical properties using ultrasound. *Annals of Biomedical Engineering* 2011, 39(10):2521 – 2530. PMID: 21773854, PMCID: PMC3418603.
 26. Sarkar, S.; Bustard, B.L.; **Welter, J.F.**; and Baskaran, H.: Combined experimental and mathematical approach for development of microfabrication-based cancer migration assay. *Annals of Biomedical Engineering* 2011, 39(9):2346 – 2359. PMID: 21701934, PMCID: PMC3165198,
<https://doi.org/10.1007/s10439-011-0337-y>
 27. Auletta, J.J.; Zale, E.A.; **Welter, J.**; and Solchaga, L.: Fibroblast growth factor-2 enhances expansion of human bone marrow-derived mesenchymal stromal cells without diminishing their immunosuppressive

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Abstracts/Presentations:

1. Zhang, B.; Zhong, Y.; Berilla, J.; **Welter, J.F.**; Clark, K.L.; Alexander, P.; and Baskaran, H.: Effect of flexion on amino acids uptake during human mesenchymal stem cell chondrogenesis. BMES 2021 Orlando, FL, October 6-9.
2. Wang, Y.; Berilla, J.; **Welter, J.F.**; and Baskaran, H.: Analysis of oxygen consumption by human mesenchymal stem cells (hMSCs) during chondrogenesis BMES 2021 Orlando, FL, October 6-9
3. Dai, Y.; Xu, W.; Somoza, R.A.; **Welter, J.F.**; Caplan, A.I.; and Liu, C.C.: Synthetic biology mediated electrochemical sensing strategy. AIChE 2021, Boston, MA, November 5-11, presentation 210c
4. Dai, Y.; Somoza, R.A.; Xu, W.; **Welter, J.F.**; Caplan, A.I.; and Liu, C.C.: CRISPR-Cas12a mediated universal electrochemical biosensing platform. AIChE 2020, virtual presentation 556f, Nov. 19, 2020.
5. Dai, Y.; Somoza, R.A.; Xu, W.; **Welter, J.F.**; Caplan, A.I.; and Liu, C.C.: CRISPR-Cas systems mediated electrochemical biosensing platforms. AIChE 2020, virtual poster 337l, Nov. 17, 2020.
6. Baskaran, H.; Motavalli, M.; and **Welter, J.F.**: CWRU Center for Multimodal Evaluation of Engineered Cartilage. BMES 2020, Virtual exhibitor booth. October 14 – 17.

7. Motavalli, M.; Mansour, J.; Bensusan, J.; Li, M.; Margevicius, S.; and **Welter, J.**: Ultrasound measurements and modeling of relationships between speed of sound and compression in articular cartilage. BMES 2020 Virtual poster. October 14 – 17.
8. Zhang, B.; Zhong, Y.; Berilla, J.; **Welter, J.**; Clark, K.; Alexander, P.; Baskaran, H.: Effect of flexion during human mesenchymal stem cell chondrogenesis. BMES 2020 Virtual poster. October 14 – 17.
9. Motavalli, M.; Blackburn, B.; **Welter, J.**; Mansour, J.; Rollins, A.: Optical coherence tomography analysis of articular cartilage under dynamic biaxial loads. TERMIS 2019, Poster 171. Orlando, FL, December 2 – 5, 2019.
10. Motavalli, M.; Jones, C.; **Welter, J.F.**; Berilla, J.; Li, M.; Schluchter, M.; Mansour, J.: Freeze-thaw cycling effects on articular cartilage anisotropy using ultrasound techniques TERMIS 2019, Presentation 118. Orlando, FL, December 2 – 5, 2019.
11. Baskaran, H.; Motavalli, M.; and **Welter, J.F.**: CWRU Center for Multimodal Evaluation of Engineered Cartilage. BMES 2019, Exhibitor booth # 121. Philadelphia, PA, October 16 – 19, 2019.
12. Zhang, B.; Zhong, Y.; Berilla, J.; Motavalli, M.; **Welter, J.F.**; Caplan, A.I.; Clark, K.L.; Piroso, A.; Alexander, P.; and Baskaran, H.: Bioreactor development for joint segmentation model to investigate toxicants/teratogens. BMES 2019, Poster P-TH-239. Philadelphia, PA, October 16 – 19, 2019
13. Motavalli, M.; Blackburn, B.; **Welter, J.F.**; Mansour, J.M.; and Rollins, A.M.: Articular cartilage mechanical behavior under dynamic biaxial loads: optical coherence tomography analysis. BMES 2019, poster P-FRI-211. Philadelphia, PA, October 16 – 19, 2019.
14. Motavalli, M.; Jones, C.; **Welter, J.F.**; Berilla, J.; Li, M.; Schluchter, M.; and Mansour, J.: Acoustic anisotropy of articular cartilage and effects of freeze-thaw cycling. BMES 2019, Poster P-FRI-216. Philadelphia, PA, October 16 – 19, 2019.
15. Zhong, Y.; Welsh, A.; Caplan, A.I.; **Welter, J.F.**; and Baskaran, H.: Essential amino acids metabolism during human mesenchymal stem cell chondrogenesis. BMES 2019, Poster P-FRI-746. Philadelphia, PA, October 16 – 19, 2019
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17. **Welter, J.F.**; Baskaran, H.; Mansour, J.M.; Somoza, R.A.; Lee, Z.; Khalil, A.; Li, M.; Huang, A.; Kenyon, J.; Motavalli, M.; and Caplan, A.I.: CWRU Center for Multimodal Evaluation of Engineered Cartilage. Proceedings of the 2019 Research ShowCASE, Poster 030. Case Western Reserve University, Cleveland, OH, April 19, 2019.
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Invited Presentations:

1. Combined sliding shear and ultrasound evaluation demonstration. CTTE – 2019 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 22, 2019.
2. Joint flexion bioreactor demonstration. CTTE – 2019 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 22, 2019.
3. Combined sliding shear and ultrasound evaluation demonstration. CTTE – 2018 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 23, 2018.
4. Ultrasound applications in cartilage. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, November 7, 2016
5. Sounds Hard. Ultrasound applications in cartilage. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, December 8, 2014.
6. Cartilage Tissue Engineering. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 5, 2012.
7. Poking around in the viscosupplementation morass. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, April 16, 2012.
8. Canine and human mesenchymal stem cells, growth factors, bioreactors, and animal model studies. External Advisory Board and Co-Investigators meeting of NIH Grant R01-DE013740, Strength and resorption of biodegradable skull implants. July 21, 2011.
9. Cartilage tissue engineering. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 17, 2011.
10. Intra-articular delivery of injectable sustained-release drug formulations. NCRM Retreat, November 14, 2011.
11. Cartilage tissue engineering. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 17, 2010.
12. X marks the spot. Spatial and temporal distribution of Type X collagen in engineered cartilage. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, November 15, 2010.
13. Canine mesenchymal stem cells, growth factors, bioreactors, and toxicity. External Advisory Board and Co-Investigators meeting of NIH Grant R01-DE013740, “Strength and resorption of biodegradable skull implants”. June 2, 2010.
14. Crowding MSCs. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, February 1, 2010.
15. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 30, 2009.
16. Optimizing MSC differentiation; CTTE – 2009 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 25, 2009.
17. How thick is that? Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, March 23, 2009.
18. Bioreactors for cartilage tissue engineering; CTTE – 2008 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 26, 2008.
19. Optimizing MSC differentiation. CTTE – 2008 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 26, 2008.

20. Case study: Cartilage tissue engineering. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 15, 2007.
21. Probing MSC differentiation. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, October 29, 2007.
22. Heavy breathers: oxygen consumption in cartilage tissue engineering. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH.
23. Case study: Cartilage tissue engineering. EBME 325 guest lecture, Case Western Reserve University, Cleveland, OH, November 9, 2006.
24. Bioreactors for mesenchymal stem cell differentiation. CTTE – 2006 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, May 26, 2006.
25. Cartilage tissue engineering. Department of Biology seminar series. Case Western Reserve University, Cleveland, OH. May 4, 2006.
26. Bioreactors for mesenchymal stem cell differentiation. CTTE – 2005 “Cell-Based Therapies and Tissue Engineering” short course, Case Western Reserve University, Cleveland, OH, June 1, 2005
27. Surface characteristics of trabecular metal bone implants. Orthopaedic and Related Research Seminar series, Case Western Reserve University, Cleveland, OH, May 26, 2005
28. Surface characteristics of bone implants. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, November 29, 2004
29. More cartilage tissue engineering – Design of a hydrostatic loading bioreactor. Skeletal Research Center seminar series, Case Western Reserve University, Cleveland, OH, March 15, 2004
30. Cartilage tissue engineering. Skeletal Research Center seminar series. Case Western Reserve University, Cleveland, OH. March 10, 2003.
31. Cartilage tissue engineering. Orthopaedic grand rounds, Case Western Reserve University and University Hospitals of Cleveland, Cleveland, OH. February 22, 2003.
32. Cartilage tissue engineering. Issues and approaches. CWRU/CCF musculoskeletal research seminar series. Case Western Reserve University, Cleveland, OH, December 12, 2002.
33. Cartilage tissue engineering. Presented to the Arthritis Foundation Board of Trustees, Cleveland, OH, October 29, 2002.