

SARAH A. BENTIL, PH.D.

JULY 2024

ADDRESS: Iowa State University of Science and Technology
Department of Mechanical Engineering
2106 H.M. Black Engineering Building
2529 Union Drive
Ames, IA 50011-2030
TEL: +1 515 294-8528
FAX: +1 515 294-3261
EMAIL: sbentil@iastate.edu
WEBSITE: <http://www.me.iastate.edu/sbentil/>

PUBLICATIONS

KEY: Postdoctoral scholars Graduate students Undergraduate students

REFEREED RESEARCH PAPERS

1. M. Co, C. Pack, Z. Osborn-King, B. Raterman, A. Kolipaka, **SA. Bentil**, and BA. Walter (2024). Modeling the Effects of Hydration on Viscoelastic Properties of Nucleus Pulposus Tissue in Shear Using the Fractional Zener Model. *Journal of Biomechanics* **164**, 111965. doi: [10.1016/j.jbiomech.2024.111965](https://doi.org/10.1016/j.jbiomech.2024.111965).
2. R. Ghosh, **SA. Bentil**, and JJ. Juárez (2024). Particle-Wall Hydrodynamic Effects on Optical Trapping Viscometry. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **682**, 132942. doi: [10.1016/j.colsurfa.2023.132942](https://doi.org/10.1016/j.colsurfa.2023.132942). (Visited on 07/09/2024).
3. **JL. Marsh**, **L. Zinnel**, and **SA. Bentil** (2024). Predicting Shock-Induced Cavitation Using Machine Learning: Implications for Blast-Injury Models. *Frontiers in Bioengineering and Biotechnology* **12**. doi: [10.3389/fbioe.2024.1268314](https://doi.org/10.3389/fbioe.2024.1268314).
4. V. Kosmerl, **SA. Bentil**, and AL. Yarin (2024). Rheological Behavior of Brain Tissue: Experiments vs Theory and Forensic Applications. *Physics of Fluids* **36**(5), 051904. doi: [10.1063/5.0208745](https://doi.org/10.1063/5.0208745).
5. H. Liu, S. Laflamme, C. Morgan, M. Nelson, and **SA. Bentil** (2023). Real-Time Nondestructive Evaluation of Additive Manufacturing Using a Laser Vibrometer and Shock Tube. *Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems* **6**(1) ("Best Paper" Award in 2023 for the Journal), 011005. doi: [10.1115/1.4055383](https://doi.org/10.1115/1.4055383).
6. H. Liu, S. Laflamme, **SA. Bentil**, R. James, D. Bruder, and M. McGovern (2023). Real-time Nondestructive Evaluation of Electrode Weld Stacks using a Laser Vibrometer and Shock Tube. *Manufacturing Letters* **37**, 17–20. doi: [10.1016/j.mfglet.2023.06.001](https://doi.org/10.1016/j.mfglet.2023.06.001).
7. **L. Zinnel** and **SA. Bentil** (2023). Convolutional Neural Networks for Traumatic Brain Injury Classification and Outcome Prediction. *Health Sciences Review* **9**, 100126. doi: [10.1016/j.hsr.2023.100126](https://doi.org/10.1016/j.hsr.2023.100126).
8. **SA. Bentil**, **WJ. Jackson**, C. Williams, and TC. Miller (2022). Viscoelastic Properties of Inert Solid Rocket Propellants Exposed to a Shock Wave. *Propellants, Explosives, Pyrotechnics* **47**(1) (Special Issue: Rocket Propellants), e202100055. doi: [10.1002/prep.202100055](https://doi.org/10.1002/prep.202100055).
9. **L. Zhang**, **WJ. Jackson**, and **SA. Bentil** (2022). Numerical and Experimental Investigation of an Ultrasoft Elastomer Under Shock Wave Loading. *Journal of Dynamic Behavior of Materials* **8**(1), 137–154. doi: [10.1007/s40870-021-00324-5](https://doi.org/10.1007/s40870-021-00324-5).
10. H. Liu, S. Laflamme, EM. Zellner, A. Aertsens, **SA. Bentil**, IV. Rivero, and TW. Secord (2021). Soft Elastomeric Capacitor for Strain and Stress Monitoring on Sutured Skin Tissues. *ACS Sensors* **6**(10), 3706–3714. doi: [10.1021/acssensors.1c01477](https://doi.org/10.1021/acssensors.1c01477).
11. **JL. Marsh** and **SA. Bentil** (2021). Cerebrospinal Fluid Cavitation as a Mechanism of Blast-Induced Traumatic Brain Injury: A Review of Current Debates, Methods, and Findings. English. *Frontiers in Neurology* **12**. doi: [10.3389/fneur.2021.626393](https://doi.org/10.3389/fneur.2021.626393).
12. **L. Zhang**, **WJ. Jackson**, and **SA. Bentil** (2021). Deformation of an Airfoil-Shaped Brain Surrogate under Shock Wave Loading. en. *Journal of the Mechanical Behavior of Biomedical Materials* **120**, 104513. doi: [10.1016/j.jmbbm.2021.104513](https://doi.org/10.1016/j.jmbbm.2021.104513).

13. **OF. Afuwape**, J. Boldrey, P. Rastogi, **SA. Bentil**, and D. Jiles (2021). Influence of Brain-Scalp Distance on Focality of the Quadruple Butterfly Coil for Transcranial Magnetic Stimulation. *IEEE Transactions on Magnetics*, 1–1. doi: [10.1109/TMAG.2020.3017565](https://doi.org/10.1109/TMAG.2020.3017565).
14. Z. Xu, **L. Zhang**, **SA. Bentil**, and KM. Bratlie (2021). Gellan Gum-Gelatin Viscoelastic Hydrogels as Scaffolds to Promote Fibroblast Differentiation. *Materials Science and Engineering: C* **129**, 112370. doi: [10.1016/j.msec.2021.112370](https://doi.org/10.1016/j.msec.2021.112370).
15. H. Liu, J. Yan, M. Kollosche, **SA. Bentil**, and S. Laflamme (2020). Surface Textures for Stretchable Capacitive Strain Sensors. *Smart Materials and Structures* **29**(10), 105037. doi: [10.1088/1361-665X/aba63c](https://doi.org/10.1088/1361-665X/aba63c).
16. H. Liu, M. Kollosche, J. Yan, EM. Zellner, **SA. Bentil**, IV. Rivero, C. Wiersema, and S. Laflamme (2020). Numerical Investigation of Auxetic Textured Soft Strain Gauge for Monitoring Animal Skin. *Sensors* **20**(15) (Special Issue: Flexible Sensors for Structural Health Monitoring), 4185. doi: [10.3390/s20154185](https://doi.org/10.3390/s20154185).
17. JS. Grewal et al. (2020). Brain Gyration in Wild and Domestic Canids: Has Domestication Changed the Gyration Index in Domestic Dogs? *The Journal of Comparative Neurology* **528**(18), 3209–3228. doi: [10.1002/cne.24972](https://doi.org/10.1002/cne.24972).
18. M. Na, **TJ. Beavers**, A. Chandra, and **SA. Bentil** (2019). Simulation of Brain Response to Non-Contact Impacts Using Coupled Eulerian-Lagrangian Method. *ASME Journal of Biomechanical Engineering*, BIO-19-1281. doi: [10.1115/1.4045047](https://doi.org/10.1115/1.4045047).
19. MA. Calhoun, **SA. Bentil**, E. Elliott, JJ. Otero, JO. Winter, and RB. Dupaix (2019). Beyond Linear Elastic Modulus: Viscoelastic Models for Brain and Brain Mimetic Hydrogels. *ACS Biomaterials Science & Engineering* **5**(8) (Special Issue: Biomaterials for Mechanobiology), 3964–3973. doi: [10.1021/acsbiomaterials.8b01390](https://doi.org/10.1021/acsbiomaterials.8b01390).
20. **AK. McCarty**, **L. Zhang**, **S. Hansen**, **WJ. Jackson**, and **SA. Bentil** (2019). Influence of saline solution absorption and compressive rate on the material properties of brain tissue. *Journal of the Mechanical Behavior of Biomedical Materials* **97**, 355–364. doi: [10.1016/j.jmbbm.2019.05.028](https://doi.org/10.1016/j.jmbbm.2019.05.028).
21. **AK. McCarty**, **L. Zhang**, **S. Hansen**, **WJ. Jackson**, and **SA. Bentil** (2019). Viscoelastic Response of Shock Wave Impacted Brain Tissue. *Journal of the Mechanical Behavior of Biomedical Materials* **100**, 103380. doi: [10.1016/j.jmbbm.2019.103380](https://doi.org/10.1016/j.jmbbm.2019.103380).
22. **L. Zhang**, **WJ. Jackson**, and **SA. Bentil** (2019). The mechanical behavior of brain surrogates manufactured from silicone elastomers. *Journal of the Mechanical Behavior of Biomedical Materials* **95**, 180–190. doi: [10.1016/j.jmbbm.2019.04.005](https://doi.org/10.1016/j.jmbbm.2019.04.005).
23. **SA. Bentil** and RB. Dupaix (2018). Simulations of hydrogel-coated neural microelectrodes to assess biocompatibility improvement using strain as a metric for micromotion. en. *Biomedical Physics & Engineering Express* **4**(3), 035036. doi: [10.1088/2057-1976/aab990](https://doi.org/10.1088/2057-1976/aab990).
24. **SA. Bentil**, KT. Ramesh, and TD. Nguyen (2016). A dynamic inflation test for soft materials. *Experimental Mechanics* **56**(5), 759–769. doi: [10.1007/s11340-015-0122-1](https://doi.org/10.1007/s11340-015-0122-1).
25. **SA. Bentil** and RB. Dupaix (2014). Exploring the mechanical behavior of degrading swine neural tissue at low strain rates via the fractional Zener constitutive model. *Journal of the Mechanical Behavior of Biomedical Materials* **30**, 83–90. doi: [10.1016/j.jmbbm.2013.10.020](https://doi.org/10.1016/j.jmbbm.2013.10.020).
26. SS. Rao, **SA. Bentil**, J. DeJesus, J. Larison, A. Hissong, R. Dupaix, A. Sarkar, and JO. Winter (2012). Inherent interfacial mechanical gradients in 3D hydrogels influence tumor cell behaviors. *PLoS ONE* **7**(4), e35852. doi: [10.1371/journal.pone.0035852](https://doi.org/10.1371/journal.pone.0035852).
27. E. Koprinsky, DE. Mager, **SA. Bentil**, SI. Murata, DR. Abernethy, and NM. Soldatov (2005). Identification of plasma membrane macro- and microdomains from wavelet analysis of FRET microscopy. *Biophysical Journal* **88**(5), 3625–3634. doi: [10.1529/biophysj.104.054056](https://doi.org/10.1529/biophysj.104.054056).
28. S. Ander, M. MacLennan, **SA. Bentil**, B. Leavitt, and N. Chesler (2005). Pressure-induced vector transport in human saphenous vein. *Annals of Biomedical Engineering* **33**(2), 202–208. doi: [10.1007/s10439-005-8978-3](https://doi.org/10.1007/s10439-005-8978-3).