




## Ellen Kuhl

Walter B Reinhold Professor in the School of Engineering, Robert Bosch Chair of Mechanical Engineering, Professor of Mechanical Engineering and, by courtesy, of Bioengineering

 NIH Biosketch available Online

 Curriculum Vitae available Online

### CONTACT INFORMATION

#### • Administrative Contact

Hong Clark - Executive Assistant

**Email** hongma@stanford.edu

**Tel** 650-723-4023 (office)

### Bio

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#### BIO

Ellen Kuhl is the Walter B. Reinhold Professor in the School of Engineering and Robert Bosch Chair of Mechanical Engineering at Stanford University. She is a Professor of Mechanical Engineering and, by courtesy, Bioengineering. She received her PhD from the University of Stuttgart in 2000 and her Habilitation from the University of Kaiserslautern in 2004. Her area of expertise is Living Matter Physics, the design of theoretical and computational models to simulate and predict the behavior of living systems. Ellen has published more than 200 peer-reviewed journal articles and edited two books; she is an active reviewer for more than 50 journals at the interface of engineering and medicine and an editorial board member of seven international journals in her field. She is a founding member of the Living Heart Project, a translational research initiative to revolutionize cardiovascular science through realistic simulation with 400 participants from research, industry, and medicine from 24 countries. Ellen is the current Chair of the US National Committee on Biomechanics and a Member-Elect of the World Council of Biomechanics. She is a Fellow of the American Society of Mechanical Engineers and of the American Institute for Mechanical and Biological Engineering. She received the National Science Foundation Career Award in 2010, was selected as Midwest Mechanics Seminar Speaker in 2014, and received the Humboldt Research Award in 2016 and the ASME Ted Belytschko Applied Mechanics Award in 2021. Ellen is an All American triathlete on the Wattie Ink. Elite Team, a multiple Boston, Chicago, and New York marathon runner, and a Kona Ironman World Championship finisher.

#### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Institute for Computational and Mathematical Engineering (ICME)
- Member, Wu Tsai Neurosciences Institute

#### ADMINISTRATIVE APPOINTMENTS

- Chair, Stanford Mechanical Engineering, (2019- present)
- Chair, US National Committee on Biomechanics, (2018- present)
- Member-Elect, World Council of Biomechanics, (2018- present)

- Chair, Stanford Mechanical Engineering Graduate Admission Committee, (2018-2019)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2018-2019)
- Chair, Stanford Mechanical Engineering Graduate Curriculum Committee, (2017-2018)
- Member, Stanford Long-Range Planning Steering Group Research, (2017-2018)
- Member, Stanford Neurosciences Institute Faculty Search Committee, (2017-2018)
- Member-at-Large, US Association for Computational Mechanics, (2016-2020)
- Vice Chair, US National Committee on Biomechanics, (2016-2018)
- Member, NIH IMAG Interagency Modeling Analysis Group Steering Committee, (2016-2018)
- Member, Stanford Mechanical Engineering Appointment & Promotion Committee, (2016-2018)
- Member, Stanford Leading the Biomedical Revolution, (2016-2017)
- Chair, US Association for Computational Mechanics Biological Systems, (2015- present)
- Fellow, Stanford University, (2015-2017)
- Chair, Stanford Mechanical Engineering Faculty Search Committee, (2015-2016)
- Member, Stanford Mechanical Engineering, Advisory Committee AdCom, (2014- present)
- Member, NIH Modeling and Analysis of Biological Systems MABS Study Section, (2014-2018)
- Secretary, US National Committee on Biomechanics, (2014-2016)
- Member, Stanford Faculty Voice & Influence Program, (2013-2014)
- Chair, Stanford Mechanical Engineering Graduate Admission Committee, (2012-2014)
- Member, Stanford Bioengineering Faculty Search Committee, (2010-2011)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2009-2010)
- Member, Stanford Mechanical Engineering Graduate Admission Committee, (2008-2012)
- Member, Stanford Mechanical Engineering Faculty Search Committee, (2008-2009)
- Member, Stanford Mechanical Engineering ABET Committee, (2008-2009)

## **HONORS AND AWARDS**

- ASME Ted Belytschko Applied Mechanics Award, American Society of Mechanical Engineers (2021)
- ASME Fellow, American Society of Mechanical Engineers (2017)
- Humboldt Research Award, Alexander von Humboldt Stiftung (2016)
- AIMBE Fellow, American Institute for Medical and Biological Engineering (2014)
- NSF CAREER Award, National Science Foundation (2010-2014)
- Hellman Faculty Scholar, Hellman Faculty Scholar (2009)
- Habilitation Research Fellowship, German National Science Foundation (DFG) (2001-2004)
- Graduate Research Fellowship, German National Science Foundation (DFG) (1996-1999)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Associate Editor, Journal of the Mechanics and Physics of Solids (2015 - present)
- Associate Editor, Annals of Biomedical Engineering (2015 - present)
- Editorial Board Member, Biomechanics and Modeling in Mechanobiology (2015 - present)
- Editorial Adviser, Journal of the Mechanics and Physics of Solids (2013 - 2015)
- Editorial Board Member, Journal of Computational Surgery (2012 - present)

- Associate Editor, ASME Applied Mechanics Reviews (2012 - 2016)
- Editorial Board Member, Acta Mechanica Sinica (2011 - present)
- Editorial Board Member, Comp Methods Biomechanics and Biomed Engineering (2011 - present)
- Editorial Board Member, Int J Numerical Methods in Biomedical Engineering (2011 - present)

## PROFESSIONAL EDUCATION

- habil., TU Kaiserslautern (2004)
- Ph.D., University of Stuttgart (2000)
- M.S., Leibniz University of Hanover (1995)
- B.S., Leibniz University of Hanover (1993)

## LINKS

- Lab Website: <http://biomechanics.stanford.edu>
- Google Scholar: <https://scholar.google.com/citations?user=jjQDKYYAAAAJ&hl=en>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am a Professor of Mechanical Engineering, Bioengineering (courtesy), and Cardiothoracic Surgery (courtesy). My area of professional expertise is living matter physics, the creation of theoretical and computational models to predict the acute and chronic response of living structures to environmental changes during development and disease progression. My specific interest is the multiscale modeling of growth and remodeling, the study of how living matter adapts its form and function to changes in mechanical loading, and how this adaptation could be traced back to structural alterations on the cellular or molecular levels. Growth and remodeling might be induced naturally, e.g., through elevated pressure, stress, or strain, or interventionally, e.g., through prostheses, stents, tissue grafts, or stem cell injection. Combining theories of electrophysiology, photoelectrochemistry, biophysics, and continuum mechanics, my lab has specialized in predicting the chronic loss of form and function in growing and remodeling cardiac tissue using patient-specific custom-designed finite element models.

## Teaching

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### COURSES

#### 2021-22

- Data-driven modeling of COVID-19: ME 233 (Aut)

#### 2020-21

- Data-driven modeling of COVID-19: ME 233 (Aut)

#### 2019-20

- Introduction to Neuromechanics: ME 234 (Win)

#### 2018-19

- Introduction to Neuromechanics: ME 234 (Aut)
- Mechanics of Growth: ME 337 (Win)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Tina White

#### Postdoctoral Faculty Sponsor

Mathias Peirlinck

**Doctoral Dissertation Advisor (AC)**

Bartek Kaczmarski, Amelie Schaefer, Sarah St. Pierre, Oguz Ziya Tikenogullari, Camille Townshend, Lucy Wang

**Doctoral Dissertation Co-Advisor (AC)**

Omar El Safty, Fikunwa Kolawole

**Master's Program Advisor**

Latifah Hani Hamzah, Fareeha Safir

**Doctoral (Program)**

Max Beeman, Delaney Miller, Jonathan Pham

**Publications**

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**PUBLICATIONS**

- **Bayesian Physics-Based Modeling of Tau Propagation in Alzheimer's Disease.** *Frontiers in physiology*  
Schafer, A., Peirlinck, M., Linka, K., Kuhl, E., Alzheimer's Disease Neuroimaging Initiative (ADNI)  
2021; 12: 702975
- **Outbreak dynamics of COVID-19 in Europe and the effect of travel restrictions** *Comp Meth Biomech Biomed Eng*  
Linka, K., Peirlinck, M., Sahli Costabal, F., Kuhl, E.  
2020; 23: 710-717
- **Network Diffusion Modeling Explains Longitudinal Tau PET Data.** *Frontiers in neuroscience*  
Schafer, A., Mormino, E. C., Kuhl, E.  
2020; 14: 566876
- **The reproduction number of COVID-19 and its correlation with public health interventions.** *Computational mechanics*  
Linka, K. n., Peirlinck, M. n., Kuhl, E. n.  
2020: 1–16
- **Integrating machine learning and multiscale modeling-perspectives, challenges, and opportunities in the biological, biomedical, and behavioral sciences.** *NPJ digital medicine*  
Alber, M. n., Buganza Tepole, A. n., Cannon, W. R., De, S. n., Dura-Bernal, S. n., Garikipati, K. n., Karniadakis, G. n., Lytton, W. W., Perdikaris, P. n., Petzold, L. n., Kuhl, E. n.  
2019; 2: 115
- **Connectomics of neurodegeneration.** *Nature neuroscience*  
Kuhl, E. n.  
2019; 22 (8): 1200–1202
- **Effects of B.1.1.7 and B.1.351 on COVID-19 Dynamics: A Campus Reopening Study** *ARCHIVES OF COMPUTATIONAL METHODS IN ENGINEERING*  
Linka, K., Peirlinck, M., Schaefer, A., Tikenogullari, O., Goriely, A., Kuhl, E.  
2021
- **COVID-19 dynamics across the US: A deep learning study of human mobility and social behavior** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Bhourri, M., Costabal, F., Wang, H., Linka, K., Peirlinck, M., Kuhl, E., Perdikaris, P.  
2021; 382
- **Are college campuses superspreaders? A data-driven modeling study.** *Computer methods in biomechanics and biomedical engineering*  
Lu, H., Weintz, C., Pace, J., Indana, D., Linka, K., Kuhl, E.  
2021: 1–11
- **Global and local mobility as a barometer for COVID-19 dynamics.** *Biomechanics and modeling in mechanobiology*  
Linka, K. n., Goriely, A. n., Kuhl, E. n.

2021

- **Multiscale modeling meets machine learning: What can we learn?** *Archives of computational methods in engineering : state of the art reviews*  
Peng, G. C., Alber, M., Tepole, A. B., Cannon, W. R., De, S., Dura-Bernal, S., Garikipati, K., Karniadakis, G., Lytton, W. W., Perdikaris, P., Petzold, L., Kuhl, E.  
2021; 28 (3): 1017-1037
- **Effects of B.1.1.7 and B.1.351 on COVID-19 Dynamics: A Campus Reopening Study.** *Archives of computational methods in engineering : state of the art reviews*  
Linka, K., Peirlinck, M., Schäfer, A., Tikenogullari, O. Z., Goriely, A., Kuhl, E.  
2021: 1-12
- **Sex Differences in Drug-Induced Arrhythmogenesis.** *Frontiers in physiology*  
Peirlinck, M., Sahli Costabal, F., Kuhl, E.  
2021; 12: 708435
- **Folding drives cortical thickness variations** *EUROPEAN PHYSICAL JOURNAL-SPECIAL TOPICS*  
Holland, M. A., Budday, S., Li, G., Shen, D., Goriely, A., Kuhl, E.  
2020; 229 (17-18): 2757-78
- **Protein-protein interactions in neurodegenerative diseases: A conspiracy theory.** *PLoS computational biology*  
Thompson, T. B., Chaggar, P., Kuhl, E., Goriely, A., Alzheimers Disease Neuroimaging Initiative  
2020; 16 (10): e1008267
- **Fifty Shades of Brain: A Review on the Mechanical Testing and Modeling of Brain Tissue** *ARCHIVES OF COMPUTATIONAL METHODS IN ENGINEERING*  
Budday, S., Ovaert, T. C., Holzapfel, G. A., Steinmann, P., Kuhl, E.  
2020; 27 (4): 1187-1230
- **Editorial overview: Biomechanics and mechanobiology of tissue growth and remodeling: Current opinions** *CURRENT OPINION IN BIOMEDICAL ENGINEERING*  
Kuhl, E., Humphrey, J. D.  
2020; 15: A1-A2
- **Is it safe to lift COVID-19 travel bans? The Newfoundland story** *COMPUTATIONAL MECHANICS*  
Linka, K., Rahman, P., Goriely, A., Kuhl, E.  
2020
- **Special Issue on Uncertainty Quantification, Machine Learning, and Data-Driven Modeling of Biological Systems** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Tepole, A., Nordsletten, D., Garikipati, K., Kuhl, E.  
2020; 362
- **Towards microstructure-informed material models for human brain tissue** *ACTA BIOMATERIALIA*  
Budday, S., Sarem, M., Starck, L., Sommer, G., Pfefferle, J., Phunchago, N., Kuhl, E., Paulsen, F., Steinmann, P., Shastri, V. P., Holzapfel, G. A.  
2020; 104: 53-65
- **Physics-Informed Neural Networks for Cardiac Activation Mapping** *FRONTIERS IN PHYSICS*  
Costabal, F., Yang, Y., Perdikaris, P., Hurtado, D. E., Kuhl, E.  
2020; 8
- **Multiscale Modeling Meets Machine Learning: What Can We Learn?** *ARCHIVES OF COMPUTATIONAL METHODS IN ENGINEERING*  
Peng, G. Y., Alber, M., Tepole, A., Cannon, W., De, S., Dura-Bernal, S., Garikipati, K., Karniadakis, G., Lytton, W. W., Perdikaris, P., Petzold, L., Kuhl, E.  
2020
- **Classifying Drugs by their Arrhythmogenic Risk Using Machine Learning.** *Biophysical journal*  
Sahli-Costabal, F., Seo, K., Ashley, E., Kuhl, E.  
2020
- **Nervous Tissue Stiffens Postinjury.** *Biophysical journal*  
Kuhl, E.  
2020; 118 (2): 276-78

- **Data-driven modeling of COVID-19-Lessons learned.** *Extreme Mechanics Letters*  
Kuhl, E. n.  
2020; 100921
- **Modeling the life cycle of the human brain** *Current Opinion in Biomedical Engineering*  
Budday, S., Kuhl, E.  
2020; 15: 16-25
- **Visualizing the invisible: The effect of asymptomatic transmission on the outbreak dynamics of COVID-19.** *Computer methods in applied mechanics and engineering*  
Peirlinck, M. n., Linka, K. n., Sahli Costabal, F. n., Bhattacharya, J. n., Bendavid, E. n., Ioannidis, J. P., Kuhl, E. n.  
2020; 372: 113410
- **Outbreak dynamics of COVID-19 in China and the United States.** *Biomechanics and modeling in mechanobiology*  
Peirlinck, M. n., Linka, K. n., Sahli Costabal, F. n., Kuhl, E. n.  
2020
- **Neuronal Oscillations on Evolving Networks: Dynamics, Damage, Degradation, Decline, Dementia, and Death.** *Physical review letters*  
Goriely, A. n., Kuhl, E. n., Bick, C. n.  
2020; 125 (12): 128102
- **Modeling and simulation of infectious diseases.** *Computational mechanics*  
Zohdi, T. I., Kuhl, E. n.  
2020; 1
- **Multi-fidelity classification using Gaussian processes: Accelerating the prediction of large-scale computational models** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Costabal, F., Perdikaris, P., Kuhl, E., Hurtado, D. E.  
2019; 357
- **Viscoelasticity of the axon limits stretch-mediated growth** *COMPUTATIONAL MECHANICS*  
Wang, L. M., Kuhl, E.  
2019
- **Do annuloplasty rings designed to treat ischemic/functional mitral regurgitation alter left-ventricular dimensions in the acutely ischemic ovine heart?** *JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY*  
Bothe, W., Kvitting, J., Rausch, M. K., Timek, T. A., Swanson, J. C., Liang, D. H., Walther, M., Kuhl, E., Ingels, N. B., Miller, D.  
2019; 158 (4): 1058–68
- **On the implementation of finite deformation gradient-enhanced damage models** *COMPUTATIONAL MECHANICS*  
Ostwald, R., Kuhl, E., Menzel, A.  
2019; 64 (3): 847–77
- **The Shrinking Brain: Cerebral Atrophy Following Traumatic Brain Injury** *ANNALS OF BIOMEDICAL ENGINEERING*  
Harris, T. C., de Rooij, R., Kuhl, E.  
2019; 47 (9): 1941–59
- **Growth and remodelling of living tissues: perspectives, challenges and opportunities.** *Journal of the Royal Society, Interface*  
Ambrosi, D., Ben Amar, M., Cyron, C. J., DeSimone, A., Goriely, A., Humphrey, J. D., Kuhl, E.  
2019; 16 (157): 20190233
- **Predicting critical drug concentrations and torsadogenic risk using a multiscale exposure-response simulator** *PROGRESS IN BIOPHYSICS & MOLECULAR BIOLOGY*  
Costabal, F., Yao, J., Sher, A., Kuhl, E.  
2019; 144: 61–76
- **Revisiting the wrinkling of elastic bilayers I: linear analysis** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*  
Alawiye, H., Kuhl, E., Goriely, A.  
2019; 377 (2144)

- **Revisiting the wrinkling of elastic bilayersI: linear analysis.** *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences*  
Alawiye, H., Kuhl, E., Goriely, A.  
2019; 377 (2144): 20180076
- **Machine learning in drug development: Characterizing the effect of 30 drugs on the QT interval using Gaussian process regression, sensitivity analysis, and uncertainty quantification** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Costabal, F., Matsuno, K., Yao, J., Perdikaris, P., Kuhl, E.  
2019; 348: 313–33
- **A physics-based model explains the prion-like features of neurodegeneration in Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Weickenmeier, J., Jucker, M., Goriely, A., Kuhl, E.  
2019; 124: 264–81
- **Understanding the mechanical link between oriented cell division and cerebellar morphogenesis.** *Soft matter*  
Lejeune, E., Dortdivanlioglu, B., Kuhl, E., Linder, C.  
2019
- **Do annuloplasty rings designed to treat ischemic/functional mitral regurgitation alter left-ventricular dimensions in the acutely ischemic ovine heart?** *The Journal of thoracic and cardiovascular surgery*  
Bothe, W., Escobar Kvitting, J., Rausch, M. K., Timek, T. A., Swanson, J. C., Liang, D. H., Walther, M., Kuhl, E., Ingels, N. B., Miller, D. C.  
2019
- **Prion-like spreading of Alzheimer's disease within the brain's connectome.** *Journal of the Royal Society, Interface*  
Fornari, S. n., Schäfer, A. n., Jucker, M. n., Goriely, A. n., Kuhl, E. n.  
2019; 16 (159): 20190356
- **Spatially-extended nucleation-aggregation-fragmentation models for the dynamics of prion-like neurodegenerative protein-spreading in the brain and its connectome.** *Journal of theoretical biology*  
Fornari, S. n., Schäfer, A. n., Kuhl, E. n., Goriely, A. n.  
2019: 110102
- **Machine learning in drug development: Characterizing the effect of 30 drugs on the QT interval using Gaussian process regression, sensitivity analysis, and uncertainty quantification.** *Computer methods in applied mechanics and engineering*  
Costabal, F. S., Matsuno, K. n., Yao, J. n., Perdikaris, P. n., Kuhl, E. n.  
2019; 348: 313–33
- **Symmetry Breaking in Wrinkling Patterns: Gyri Are Universally Thicker than Sulci** *PHYSICAL REVIEW LETTERS*  
Holland, M., Budday, S., Goriely, A., Kuhl, E.  
2018; 121 (22)
- **Modeling the Axon as an Active Partner with the Growth Cone in Axonal Elongation** *BIOPHYSICAL JOURNAL*  
de Rooij, R., Kuhl, E., Miller, K. E.  
2018; 115 (9): 1783–95
- **Predicting critical drug concentrations and torsadogenic risk using a multiscale exposure-response simulator.** *Progress in biophysics and molecular biology*  
Sahli Costabal, F., Yao, J., Sher, A., Kuhl, E.  
2018
- **The Shrinking Brain: Cerebral Atrophy Following Traumatic Brain Injury.** *Annals of biomedical engineering*  
Harris, T. C., de Rooij, R., Kuhl, E.  
2018
- **Multiphysics of Prionlike Diseases: Progression and Atrophy.** *Physical review letters*  
Weickenmeier, J., Kuhl, E., Goriely, A.  
2018; 121 (15): 158101
- **Modeling the Axon as an Active Partner with the Growth Cone in Axonal Elongation.** *Biophysical journal*  
de Rooij, R., Kuhl, E., Miller, K. E.  
2018

- **Mechanical Cues in Spinal Cord Injury.** *Biophysical journal*  
Kuhl, E.  
2018
- **Physical Biology of Axonal Damage** *FRONTIERS IN CELLULAR NEUROSCIENCE*  
de Rooij, R., Kuhl, E.  
2018; 12: 144
- **Improving tissue expansion protocols through computational modeling** *JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS*  
Lee, T., Vaca, E. E., Ledwon, J. K., Bae, H., Topczewska, J. M., Turin, S. Y., Kuhl, E., Gosain, A. K., Tepole, A.  
2018; 82: 224–34
- **Predicting drug-induced arrhythmias by multiscale modeling** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN BIOMEDICAL ENGINEERING*  
Costabal, F., Yao, J., Kuhl, E.  
2018; 34 (5): e2964
- **A physical multifield model predicts the development of volume and structure in the human brain** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
de Rooij, R., Kuhl, E.  
2018; 112: 563–76
- **Interpreting Activation Mapping of Atrial Fibrillation: A Hybrid Computational/Physiological Study** *ANNALS OF BIOMEDICAL ENGINEERING*  
Costabal, F., Zaman, J. B., Kuhl, E., Narayan, S. M.  
2018; 46 (2): 257–69
- **Growth and remodeling play opposing roles during postnatal human heart valve development** *SCIENTIFIC REPORTS*  
Oomen, P. A., Holland, M. A., Bouten, C. C., Kuhl, E., Loerakker, S.  
2018; 8: 1235
- **Microtubule Polymerization and Cross-Link Dynamics Explain Axonal Stiffness and Damage** *BIOPHYSICAL JOURNAL*  
de Rooij, R., Kuhl, E.  
2018; 114 (1): 201–12
- **Magnetic resonance elastography of the brain: A comparison between pigs and humans** *JOURNAL OF THE MECHANICAL BEHAVIOR OF BIOMEDICAL MATERIALS*  
Weickenmeier, J., Kurt, M., Ozkaya, E., Wintermark, M., Pauly, K., Kuhl, E.  
2018; 77: 702–10
- **Symmetry Breaking in Wrinkling Patterns: Gyri Are Universally Thicker than Sulci.** *Physical review letters*  
Holland, M. n., Budday, S. n., Goriely, A. n., Kuhl, E. n.  
2018; 121 (22): 228002
- **Predicting the cardiac toxicity of drugs using a novel multiscale exposure-response simulator** *COMPUTER METHODS IN BIOMECHANICS AND BIOMEDICAL ENGINEERING*  
Costabal, F., Yao, J., Kuhl, E.  
2018; 21 (3): 232–46
- **Determining the Differential Effects of Stretch and Growth in Tissue-Expanded Skin: Combining Isogeometric Analysis and Continuum Mechanics in a Porcine Model** *DERMATOLOGIC SURGERY*  
Purnell, C. A., Gart, M. S., Buganza-Tepole, A., Tomaszewski, J. P., Topczewska, J. M., Kuhl, E., Gosain, A. K.  
2018; 44 (1): 48–52
- **Pilot Findings of Brain Displacements and Deformations during Roller Coaster Rides** *JOURNAL OF NEUROTRAUMA*  
Kuo, C., Wu, L. C., Ye, P. P., Laksari, K., Camarillo, D. B., Kuhl, E.  
2017; 34 (22): 3198–3205
- **The importance of mechano-electrical feedback and inertia in cardiac electromechanics** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Costabal, F., Concha, F. A., Hurtado, D. E., Kuhl, E.  
2017; 320: 352–68



- **Wrinkling instabilities in soft bilayered systems** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*  
Budday, S., Andres, S., Walter, B., Steinmann, P., Kuhl, E.  
2017; 375 (2093)
- **The mechanical importance of myelination in the central nervous system.** *Journal of the mechanical behavior of biomedical materials*  
Weickenmeier, J., de Rooij, R., Budday, S., Ovaert, T. C., Kuhl, E.  
2017
- **Quantification of Strain in a Porcine Model of Skin Expansion Using Multi-View Stereo and Isogeometric Kinematics** *JOVE-JOURNAL OF VISUALIZED EXPERIMENTS*  
Tepole, A. B., Vaca, E. E., Purnell, C. A., Gart, M., McGrath, J., Kuhl, E., Gosain, A. K.  
2017
- **Modeling molecular mechanisms in the axon** *COMPUTATIONAL MECHANICS*  
de Rooij, R., Miller, K. E., Kuhl, E.  
2017; 59 (3): 523-537
- **The mechanics of decompressive craniectomy: Personalized simulations** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Weickenmeier, J., Butler, C. A., Young, P. G., Goriely, A., Kuhl, E.  
2017; 314: 180-195
- **A virtual sizing tool for mitral valve annuloplasty.** *International journal for numerical methods in biomedical engineering*  
Rausch, M. K., Zöllner, A. M., Genet, M., Baillargeon, B., Bothe, W., Kuhl, E.  
2017; 33 (2)
- **Mechanical characterization of human brain tissue** *ACTA BIOMATERIALIA*  
Budday, S., Sommer, G., Birkl, C., Langkammer, C., Haybaeck, J., Kohnert, J., Bauer, M., Paulsen, F., Steinmann, P., Kuhl, E., Holzapfel, G. A.  
2017; 48: 319-340
- **Instabilities of soft films on compliant substrates** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Holland, M. A., Li, B., Feng, X. Q., Kuhl, E.  
2017; 98: 350-365
- **Dimensional, Geometrical, and Physical Constraints in Skull Growth.** *Physical review letters*  
Weickenmeier, J. n., Fischer, C. n., Carter, D. n., Kuhl, E. n., Goriely, A. n.  
2017; 118 (24): 248101
- **The Pursuit of Engineering the Ideal Heart Valve Replacement or Repair: A Special Issue of the Annals of Biomedical Engineering.** *Annals of biomedical engineering*  
Dasi, L. P., Grande-Allen, J. n., Kunzelman, K. n., Kuhl, E. n.  
2017; 45 (2): 307-9
- **Passive Stretch Induces Structural and Functional Maturation of Engineered Heart Muscle as Predicted by Computational Modeling.** *Stem cells (Dayton, Ohio)*  
Abilez, O. J., Tzatzalos, E. n., Yang, H. n., Zhao, M. T., Jung, G. n., Zöllner, A. M., Tiburcy, M. n., Riegler, J. n., Matsa, E. n., Shukla, P. n., Zhuge, Y. n., Chour, T. n., Chen, et al  
2017
- **The mechanics of decompressive craniectomy: Bulging in idealized geometries** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Weickenmeier, J., Kuhl, E., Goriely, A.  
2016; 96: 572-590
- **Stress Singularities in Swelling Soft Solids** *PHYSICAL REVIEW LETTERS*  
Goriely, A., Weickenmeier, J., Kuhl, E.  
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