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Guest Editor for this issue of *MRS Bulletin*

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Bellamkonda is the Carol Ann and David D. Flanagan Chair in Biomedical Engineering and a GCC Distinguished Scholar at the Georgia Institute of Technology and Emory University School of Medicine. He also serves as the associate vice president for research. He is the director of the Neurological Biomaterials and Cancer Therapeutics Lab at the Coulter

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Pai is a senior research scientist in the Department of Biomedical Engineering at the Georgia Institute of Technology and Emory University School of Medicine. After receiving his PhD degree from the Indian Institute of Science, he

was a NIH Fogarty Visiting Fellow. He continued his research at the University of Calgary, Canada, and the Yale University School of Medicine. His current research interests include understanding cell and molecular mechanisms and developing biomaterial-based solutions to nervous system deficiencies/diseases, including cancer.



#### Philippe Renaud

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Renaud is a professor at the Microsystem Laboratory (LMIS4) at EPFL. He is also the scientific director of the EPFL Center of Micro-NanoTechnology (CMI). His main research is related to micronano technologies in biomedical applications (BioMEMS), with an emphasis on cell chips, nanofluidics, and bioelectronics.

Renaud received his diploma in physics from the University of Neuchâtel (1983) and his PhD degree from the University of Lausanne (1988). He was a postdoctoral fellow at the University of California, Berkeley (1988–1989), and then at the IBM Zürich Research Laboratory in Switzerland (1990–1991). In 1992, he joined the Sensors and Actuators group of the Swiss Center for Electronics and Microtechnology (CSEM) at Neuchâtel, Switzerland. He was appointed assistant professor at EPFL in 1994 and full professor in 1997. In 1996, he was a visiting professor at Tohoku University, Japan. Renaud is active in several scientific committees; he is a co-founder of the Nanotech-Montreux conference; and he is a founding member of the MSN conference.



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Allen received a BA degree in chemistry, a BSE degree in chemical engineering, and a BSE degree in electrical engineering from the University of Pennsylvania, and SM and PhD degrees (1989) from the Massachusetts Institute of Technology. In 1989, he joined the faculty of the School of Electrical and Computer Engineering of the Georgia Institute of Technology, where he currently holds the rank of Regents' Professor

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Boehler is a staff member with the Faculty of Engineering (IMTEK) at the University of Freiburg, Germany. He received his MS degree in microsystems engineering in 2011 from the University of Freiburg. Afterward, he joined Freiburg's Biomedical Microtechnology group in his current position. His research focuses on

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assemblage of the same.

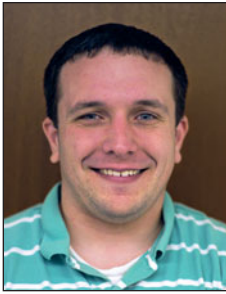


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Capadona has been an assistant professor of biomedical engineering at Case Western Reserve University since the fall of 2010. He also has been a research health scientist with the L. Stokes Cleveland Department of Veterans Affairs Medical Center since 2005. He received

his PhD degree in chemistry and biochemistry from the Georgia Institute of Technology and holds a BS degree in chemistry from Saint Joseph's College in Rensselaer, Indiana. Capadona pursues a research track that develops materials that will seamlessly assimilate within neural tissue to facilitate molecular level connections with individual neurons by mediating the inflammatory response and interacting with the normal cellular machinery. His research incorporates both fundamental and translational aspects of materials science, biomedical engineering, and neuroscience.


**Jonathan M. Cayce**

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Cayce is currently working toward his PhD degree in biomedical engineering in the Department of Biomedical Engineering at Vanderbilt University. He received his BS degree from the University of Alabama at Birmingham, in 2006, and his MS degree from Vanderbilt in 2008—both in biomedical engineering. Cayce's research interests include infrared neural stimulation for use in the central nervous system and imaging brain activity with optical methods.


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Chen is a postdoctoral fellow at the Georgia Institute of Technology (Georgia Tech) Institute for Electronics and Nanotechnology. She earned her BS degree in electrical engineering from Georgia Tech. She then completed her master's and PhD degrees at the Massachusetts Institute of Technology in electrical engineering as a National Science Foundation graduate research fellow. Chen completed her graduate work on

the impact of injury on the knee cartilage surface as it leads to osteoarthritis. Her research interests include design and fabrication of natural material bioelectronics and structural actuators design and fabrication using MEMS technology.


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ence, as well as mathematical modeling of neurophysiological processes.


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Crowder is a PhD degree student at Vanderbilt University. He earned his BS degree in biomedical engineering from the University of Texas at Austin in 2008. He joined the Sung Laboratory in the fall of 2009 and earned his MS from Vanderbilt University in 2011. He is working to develop his PhD degree dissertation project, which elucidates how synthetic substrate parameters can influence the early transformation and cancerous progression of primary

adult human mesenchymal stem cells.


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Duke is pursuing his PhD degree in biomedical engineering at Vanderbilt University. He received his BS degree from North Carolina State University in 2007, where he majored in biomedical engineering with a concentration in biomedical instrumentation. In 2009, he received his MS degree in biomedical engineering from Vanderbilt. Duke's research focuses on developing combined optical and electrical techniques for

controlling neural tissue.


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Jansen is a professor of biomedical engineering and neurosurgery at Vanderbilt University and the director of graduate studies of the Biomedical Engineering Department at Vanderbilt. He received his MS (Drs) degree in medical biology from the University of Utrecht, The Netherlands, in 1990, and MS and PhD degrees in biomedical engineering from the University of Texas at Austin in 1992 and 1994, respectively. His

research interests include novel approaches to optically probe and manipulate the neural system, mechanisms of pulsed laser ablation of biological tissue, cellular and biochemical responses of biological tissue to laser radiation, and medical applications of lasers. He has published nearly 100 scholarly articles and book chapters in addition to approximately 250 conference abstracts and proceedings. Jansen is a fellow of the International Society for Optics and Photonics, the American Institute for Medical and Biological Engineering, and the American Society for Laser Surgery and Medicine (ASLMS). He also served as ASLMS president in 2010–2011.


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Kim has been an assistant professor of bioengineering at the University of Texas at Arlington since 2007. He received his doctorate degree in bioengineering from the University of Utah in 2004. During his postdoctoral work at the Georgia Institute of Technology, Kim worked in two areas of nervous system clinical treatment after injury: neuronal protection after spinal

cord injury, and peripheral nerve regeneration after peripheral nerve injury using an aligned nanofiber-based construct. His current research focuses on peripheral nerve injury, regeneration, and interface; microfluidic enabled nerve injury and regeneration; and engineering enabled neuro-oncology for brain cancer treatment.


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Nam is an associate professor in the Department of Bio and Brain Engineering at the Korea Advanced Institute of Science and Technology in South Korea. He received his PhD degree in electrical engineering from the University of Illinois at Urbana-Champaign in 2005. His research interests include neuron-on-a-chip technology, *in vitro*

neuronal network design using surface micropatterning techniques, neuron-based biosensor platforms for high-throughput drug screenings, and multichannel signal processing in cultured neural networks. Nam also is a recipient of the 10th Young Investigator's Award from the Korean Society of Medical and Biological Engineering.



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(IMTEK, Freiburg). He held two research internships at the Australian Vision Prosthesis Group (Newcastle 2006 and Sydney 2008–2009), which directed him into the field of visual prostheses. His interests include processes for miniaturization and fabrication of complex, but reliable neural prostheses (hermetic packaging, high-density feedthroughs, electrode arrays manufacturing, and adhesion improvement). His PhD degree studies focus on functional high-density microelectrodes for a visual prosthesis.



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Romero-Ortega has been an associate professor of bioengineering at the University of Texas at Arlington since 2008. He received his doctorate degree in neuroscience from Tulane University in 1997, and subsequently performed postdoctoral training in gene transfer and developmental biology at the University of Texas Southwestern Medical Center (UTSW).

In 2002, Romero-Ortega became director of the Regenerative Neurobiology Research Division at Texas Scottish Rite Hospital for Children and an associate professor of neurology and plastic surgery at UTSW. His research focuses in the general area of spinal cord injury monitoring and neuroprotection, peripheral nerve gap injury repair, and regenerative peripheral neurointerfaces.



#### Stuart J. Rowan

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Rowan is the Kent H. Smith Professor of Engineering, a professor of macromolecular science and engineering, and director of the Institute for Advanced Materials at Case Western Reserve University (CWRU). He received his BSc and PhD degrees in chemistry from the University of Glasgow and carried out postdoctoral research with Professor Jeremy Sanders, fellow of the

Royal Society (FRS) at the University of Cambridge and with Sir Fraser Stoddart (FRS) at the University of California, Los Angeles. In 1999, Rowan moved to CWRU, becoming a full professor in 2008. He also holds secondary appointments in the Departments of Chemistry and Biomedical Engineering at CWRU and is deputy editor at *ACS Macro Letters*. His current research interests include different aspects of supramolecular polymers and materials, specifically exploring their uses in the fields of stimuli-responsive materials, re-healable materials, and biomaterials.



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the Fraunhofer-Institute for Biomedical Engineering in St. Ingbert, Germany, where he worked on micromachined neural interfaces. Schuettler subsequently received his PhD degree from the University of Saarland, Germany, in 2002. He headed the neural electrode section until joining the Implanted Devices Group at University College London as a visiting research fellow in 2003, where he developed a technology for fiber-selective peripheral nerve recording. In 2008, he was appointed visiting associate professor by the University of New South Wales, Australia, joining the Australian Vision Prosthesis Group for three months. In 2010, Schuettler co-founded the spin-off company CorTec, which develops and distributes brain machine interfaces.



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Stieglitz has been a full professor of biomedical microtechnology with the faculty of engineering at the University of Freiburg since 2004. He received his Dipl.-Ing degree in electrical engineering from the Universität Karlsruhe in 1993. He also received his Dr.-Ing degree (1998) and qualified as a university lecturer (Habilitation) in

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Sung joined Vanderbilt University as an assistant professor of biomedical engineering in 2009. He conducted his postdoctoral and graduate studies at the Georgia Institute of Technology (joint program with Emory University School of Medicine) from 2001 to 2006. He had previous master's degree training in medical engineering and undergraduate training in biochemistry at Yonsei University in South Korea. He also was

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#### Dustin J. Tyler

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#### Christoph Weder

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Weder has been a professor of polymer chemistry and materials at the Adolphe Merkle Institute of the University of Fribourg (Switzerland) since 2009. He also serves as director of the new center for fundamental and applied research on soft nanomaterials. He was educated at ETH Zürich, Switzerland, and the Massachusetts

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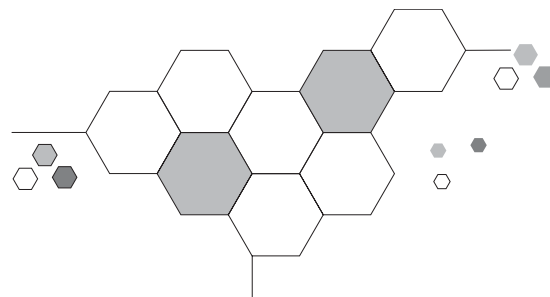


#### Christian A. Zorman

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