

## UC SAN DIEGO NANOENGINEERING SEMINAR

Wednesday, September 12, 2018

Seminar Presentation: 11:00am – 12:00pm

**SME 448**

### “Applications of Nanomedicine in the Field of Chronic Pain: Current Field and Future Prospects”

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**Abstract:** The translation of basic scientific research to applied smart nanosystems has tremendous diagnostic and clinical potential to address acute and chronic pain. Nanotechnology incorporates materials of different compositions that exhibit unique attributes at the nanometric scale. From sophisticated nanosystems that function as diminutive vehicles for targeted gene and drug delivery, to enhanced imaging and diagnostics, nanomedicine is poised to make a significant impact toward the control of pain in both inpatient and outpatient settings. Medical practitioners have the responsibility to become more aware of the potential of advanced nanomedical technologies, and their limitations, as a rapidly increasing number of new nanodrugs and compounds permeate clinical practice worldwide. Chronic pain affects ~1.5 billion people worldwide, with 23% to 26% of the population experiencing lower back pain alone. Every aspect of an individual’s daily life is altered when confronted with debilitating pain, which can produce chronic emotional and psychological distress. However, evidence-based clinical data are less than adequate to support the long-term use of chronic opioid therapy, particularly in light of the current opioid abuse epidemic. Therefore, it is becoming increasingly urgent to discover and implement novel methods for the treatment of pain. As medical practitioners deal with this growing problem, emerging technologies, particularly nanomedicine, are poised to facilitate improved therapies and diagnostic modalities. This talk will highlight current novel developments in the field of nanomedicine and chronic pain and future prospects for further research with a focus on cross discipline collaborations.

**Biosketch:** Dr. Krishnan Chakravarthy: University at Buffalo School of Medicine and Biomedical Sciences (MD, PhD 2012, Anesthesiology residency at Johns Hopkins Hospital (2016), Chronic Pain Fellowship at Massachusetts General Hospital/Harvard Medical School (2017). He is Assistant Clinical Professor in Anesthesiology at UC San Diego and VA San Diego Health System (2017-present). He is affiliate faculty at the UCSD Department of NanoEngineering. He is also co-director of the UCSD Institute of Engineering in Medicine Center for Mobile-health Systems and Applications (CMSA). He has published many papers in highly reputed journals in anesthesiology and pain medicine and sits on the editorial board of several national and international journals and societies. He is a recipient of several national research awards and has had his research featured in Futurity, NewsMedical, Times of India, and other international venues. He is a co-founder of three biotechnology companies. He is a consultant and key opinion leader for Abbott and Bioness neuromodulation therapy.