

**8th Annual  
LLNL/LPC Science and Engineering Seminar Series  
Theory to Practice: How Science is Done**

**Bioprinting: Bringing Life to 3D Printing**

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Thursday, March 8, 2018  
6:00-7:15 pm  
Building 2400, Room 2420

Free and open to the public

**Abstract:** A key challenge in engineering tissue constructs is integrating adequate vascular networks to prevent necrosis. A microcirculation supply is not only necessary for the exchange of nutrients and waste, but it is often coupled with many functions of the organs. To address this challenge, we use a direct ink write system to print complex geometries of high cell density of 3D tissues with a vasculature. Our bioinks, mostly derived from natural extracellular matrices, are optimized to be amenable to creating a diversity of tissue mimetics with specific physiologically relevant stiffness. Current efforts include integrating tissue of interest (i.e. blood brain barrier) with our vascularized printed tissue platform to create organ-specific microvascular networks.



Dr. Monica Moya is a biomedical engineer researcher in the Materials Engineering Division at Lawrence Livermore National Laboratory. Currently, she works as the principal investigator and as a technical lead on two bioengineering projects. Her research interests include 3D bioprinting, organ-on-a-chip and integrating engineering and biology. She received her Bachelor's of Science from Northwestern University and her Ph.D. in biomedical engineering from Illinois Institute of Technology. A native of the LA area, she returned to the west coast to do her postdoctoral research at UC Irvine as a National Institutes of Health (NIH) Ruth Kirschstein-NRSA Fellow. Her research has resulted in 22 peer review publications, 2 book chapters and numerous national and international conference presentations.



Javier Alvarado graduated from UC Santa Cruz with a Bachelors of Science in Neuroscience & Behavior and later developed his Molecular Biology skills by earning a Biotechnology certificate at Ohlone College. Interested in learning engineering principles and their application to biological systems he attended classes at Las Positas College. Javier Alvarado currently works as an Engineering Technician at LLNL contributing to several bioengineering projects. His research interests include 3D Cell Culture, biomaterials, and applying 3D Bioprinting techniques to model in vitro the Neurovascular environment.