



## **Collin McKinney**

Director, Electronics Design Facility

Director, Nano-Device Characterization Lab (NDCL)

Faculty, Center for Biomodular Multi-Scale Systems for Precision Medicine

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### **Research and Development Interests**

Electronics for nano-scale measurements, low noise, high bandwidth amplifiers, device characterization, RF systems for mass spectrometry and plasma generation, electrochemical instrumentation, iontophoresis instrumentation, analog and digital feedback control systems, nuclear detectors and instrumentation, and signal processing. Product design and commercialization. Electronics education for non-engineers through traditional coursework (Chem 742 and 742L), workshops on general electronics, noise theory and remediation, electrochemical circuit modelling, high frequency device characterization (BeAM MakerSpace), and one-on-one interaction with students.

### **Professional Background**

President M2 Innovations, Inc. (2006—present); Founding Member, Digital NanoGenetics, LLC (2017—present); Electrical Engineer/Associate in Research, Positron Emission Tomography Facility, Duke University Medical Center (1992-2000); President, VoChor, Inc. (1993 – 2017); Vice-President and Director of Engineering, Tracera, Inc. (2000 – 2012); Vice-President and Director of Engineering, Biosystems Technologies, Inc. (1985-1992); Electrical Engineer, Texas Instruments, Inc. (1982-1985).

### **Research and Development Synopsis**

The Electronics Design Facility provides research support for a myriad of technologies across campus as well as for organizations world-wide. Technologies include electrochemistry, mass spectrometry, nuclear magnetic resonance, We are currently involved in the design of RF systems for miniature mass spectrometers, HV RF systems for research mass spectrometers, low noise electronics for nano-scale DNA and molecule detection, hardware and algorithms for image acquisition and analysis, algorithms for denoising spectrometry data, hardware and algorithms for audio signal acquisition and processing, magnetics and magnetic materials for high-efficiency and low noise systems, among others.

In addition to UNC, our customers for this design support include IBM, Merck, Mayo Clinic, Biofluidica, Targacept, 908 Devices, Lawrence Livermore National Labs, NIH-NIDA, Howard Hughes Medical Institute, University of Leicester, Polish Academy of Science, Korea Institute of Science and Technology, MIT, Yale, Emory, UT Health Science, Univ. of Virginia, Northwestern University, NCSU, ETSU, Kansas State Univ., Univ. of Kansas, Vanderbilt Univ., Albany Medical Center, Duke Univ., Medical college of Wisconsin, SUNY Buffalo, Univ. of Pittsburgh, Univ. of Minnesota, Univ. of Washington, Univ. of Maryland, George Mason Univ., Roanoke College, Univ. of Maryland, UCLA, Univ. of CO, among others.