

2. Abstract

This proposal requests an integrated Raman spectroscopy-Atomic Force Microscope instrument (AFM/Raman) Omegascope (AIST-NT, Novato, CA) for the UNMC Nanoimaging Core Facility. Omegascope supports all AFM capabilities including imaging in air, aqueous solutions and imaging of live cells. The Raman spectroscopy module of the instrument provides structural characterization at the single molecule level. The integration into an inverted microscope also allows for confocal Raman imaging.

The requested unique instrumentation will be installed in the multi-user Nanoimaging Core Facility (College of Pharmacy, UNMC) already equipped with three AFM instruments of different types including the integrated AFM/optical microscopy instrument purchased with the NIH funds (SIG program of NIH), the AFM force robot purchased with NRI funds and the Multi-Mode AFM acquired with the POE/UNMC support. Already identified projects for the Omegascope span over a wide range of disciplines including studies pertinent to targeted research areas at UNMC and UNL. The instrument will also be useful to all Nebraska research groups including UN campuses (UNMC, UNL, UNO), Creighton University and the Facility users outside the university.

The NRI grants and the office of the UNMC vice-chancellor for research currently support the Nanoimaging core facility. The plan for the long-term sustainability includes converting the facility into the NIH supported national Nanoimaging Center as part of the NIH network of Biomedical Technology Research Centers. These Centers conduct research and development on new technologies and instruments driven by the needs of basic, translational, and clinical researchers. The preproposal to NIH submitted by Yuri Lyubchenko has been reviewed favorably.