

# National Institute of Justice

**Award Title:** DNA Forensics Using Single Molecule Technology: From DNA Recovery and Extraction to Genotyping Degraded and Trace Evidence without PCR

**Award Description:**

DNA samples containing only trace amounts of DNA or DNA degraded by age, radiation, or chemical erosion will be studied. By adapting the sensitivity and specificity of single molecule techniques to forensic analysis, low copy number and degraded samples can be imaged with a minimum of manipulation and little or no amplification. Such technology will make a large impact by providing means of interrogating samples which are currently beyond the reach of existing technology. To apply technologies originally developed for relatively pristine laboratory samples to forensics, specialized protocols will be developed. Issues of sample purity will be addressed by characterizing the effectiveness of current purification protocols and developing specialized protocols for the additional purification that may be necessary for single molecule investigations. Suitable methods of quantifying DNA markers will be determined. Possibilities include using fluorescence correlation spectroscopy, step-wise photodestruction of fluorophores, Atomic Force Microscopy imaging of lengths, and fluorescence localization experiments. In addition, single molecule techniques may be used to complement existing protocols. The ability to detect and measure small quantities can provide specific information about sample composition that investigators need to properly interpret the data. Finally, the basic science associated with this project can clarify how different contaminants inhibit PCR and will therefore suggest new protocols for sample treatment to make current molecular biology approaches more effective.

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**Awardee Name:** The University of Kansas Center for Research, Inc.

**Award Number:** 2011-DN-BX-K542

**Solicitation Title:** NIJ FY 11 Basic Scientific Research to Support Forensic Science for Criminal Justice Purposes

**Fiscal Year:** 2011

**Amount:** \$587,597.00

**Earmark:** No

**Recovery Act:** No

**State/Territory:** KS

**County:** Douglas

**Congressional District:** 02

**Award Status:** Open