Invention
This invention is a new enzyme-assisted detection system for analyzing nucleic acids with real-time fluorescent signal generation.


Background
Detection of nucleic acid sequences is critical for disease diagnosis, drug development, biomedical research, and forensic testing. A nucleic acid reporter is commonly used for the detection of specific sequences. This reporter probe is labeled with a fluorescent molecule and directly binds to the target sequence. The major drawback of this approach is high cost because a unique reporter probe must be synthesized for each new sequence analyzed.

UCF researchers have developed a new approach for designing reporter probes that overcomes many of the limitations of standard techniques such as high cost and low selectivity and sensitivity. This invention uses short unmodified adaptor strands to mediate the interaction between the target sequence and the reporter probe. The same reporter probe can be used to analyze multiple sequences, allowing for lower cost, without loss of selectivity and sensitivity when used in fluorescent detection systems. Additionally, UCF’s detection system exhibits high sensitivity and is able to analyze even low concentrations of nucleic acids due to an enzymatic reaction that generates the fluorescent signal.

Applications
The invention can be used to develop a PCR-free assay for the detection of specific nucleic acid sequences such as single nucleotide polymorphisms.

Advantages
• High specificity and selectivity at ambient temperatures
• Detects low concentrations of nucleic acid
• Adaptable for the microarray format
• Cost-efficient

Lead Inventor
Dmitry Kolpashchikov, Ph.D.

Selected References