

STR WARS: A COMPARISON OF POWERPLEX® 16 HOT START AND IDENTIFILER® PLUS

Darren Warnick Ph.D., [Craig Nolde](#)

Sorenson Forensics, 2495 South West Temple, Salt Lake City, UT 84115

Human identification through single tandem repeat (STR) DNA amplification and analysis is extensively used in forensics to link a suspect to evidence at a crime scene. Low level, inhibited, and extreme mixture samples are among the more difficult sample types routinely submitted to forensic labs for analysis. Emerging technologies and amplification chemistries continually seek to overcome the challenges presented by forensic casework samples. The latest generation STR amplification “tools” in the forensic scientists’ tool box are the PowerPlex® 16 Hot Start kit from Promega and the Identifiler® Plus kit from Applied Biosystems. These chemistries have been specifically engineered to obtain usable results from even the most difficult types of forensic samples. We evaluated the performance of these new kits in a head to head comparison using the most sensitive thermo-cycling parameters recommended by each manufacturer and the following criteria: sensitivity, resistance to inhibitors, mixture analysis, and peak height ratio balance. Although we found PowerPlex® 16 Hot Start to be slightly more sensitive, both kits exhibited full profile results from low level samples containing less than 200pg total DNA. Additionally, both kits were highly resistant to inhibitors commonly encountered in forensic samples at levels known to inhibit previous generation STR amplification chemistries. The increased sensitivity allowed for more minor allele detection in mixture samples but came at the price of lower average peak height ratios under the conditions of our study. Overall we found PowerPlex® 16 Hot Start and Identifiler® Plus to be robust STR amplification chemistries that should greatly assist the forensic scientist in analyzing challenging samples encountered in the laboratory.