Title of research need: see title above
Date posted: Jan.29.16

Keywords: hair, mitochondrial, DNA, microscopic, trace evidence, association

Submitting subcommittee(s): Trace/ Materials subcommittee
(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:
1. Description of research need:

The current research on the correlation of microscopical characteristics of hairs and mitochondrial DNA only evaluates the results of casework samples where the sample source is not known [a]. Research needs to be conducted on evaluating the discriminatory ability of performing microscopical hair comparisons coupled with mitochondrial DNA where the true sample source is known. In order to be reliable, this research needs to be conducted by experienced and qualified forensic examiners (e.g. in accordance with the SWGMAT hair training guidelines).

2. Key bibliographic references relating to this research need:

See attached file.

3a. In what ways would the research results improve current laboratory capabilities?

As many laboratories are eliminating microscopical hair comparisons, this research will show the value of conducting microscopical hair comparisons prior to DNA analysis and the necessity of using these as complimentary techniques.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

The basis of both scientific methodologies is understood however no current research exists using the methods in conjunction with each other on known samples. The proposed research would determine the discrimination power that can be achieved using the two methods together.
3c. In what ways would the research results improve services to the criminal justice system?

Hair examinations are currently performed in many areas of the country and at this time questions are arising to the significance of finding an association. This research would offer scientific foundation about the ability to discriminate between individuals based on the microscopic characteristics of the hair and the mitochondrial DNA in the hair. This research might improve the uncertainty of hair associations and provide a better understanding of the limitations and capabilities of the findings.

4. Priority assessment (I, II, III, or IV):

<table>
<thead>
<tr>
<th>Major gap in current knowledge</th>
<th>Minor gap in current knowledge</th>
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</thead>
<tbody>
<tr>
<td>No current research is being conducted</td>
<td>I III</td>
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<tr>
<td>Existing current research is being conducted</td>
<td>II IV</td>
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</tbody>
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Subcommittee Approval date: 01/29/16 (16 yes; 4 absent)

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SAC

1. Does the SAC agree with the research need? Yes ☐ No ☐

2. Does the SAC agree with the priority assessment? Yes ☐ No ☐

If no, what is the priority assessment of the SAC: ☐

Approval date: __________________________

(Approval is by majority vote of SAC. Once approved, forward to QIC for posting to KAVI.)

QIC

Date posted to KAVI: __________________________

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.
OSAC Research Need Assessment Appendix

**Title of research need:** Evaluation of Combined Information Value of Microscopic Comparisons and Mitochondrial DNA Analysis for Hair Examinations

2. Key bibliographic references relating to this research need: