Isolation of High Purity Intact Nuclei from Liver Tissue

(VA Reference No. 10-098)

Highly efficient method of isolating liver nuclei for research and/or diagnostic purposes

Technology
Method and commercial kit for liver nuclei isolation

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Key Features
- Results in higher nuclei isolation yield
- Product ready technology
- Affordable
- More efficient process
- Can be used with widely available laboratory equipment

Keywords
Research tool
Diagnostic

Status
The invention has been reduced to practice and a kit has been developed.

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Technology
The Department of Veterans Affairs' novel technology seeks to provide a new method that enables the isolation of intact nuclei in a short time from small amounts of liver tissue.

Description
The method combined with a standardized commercial kit could be used by research and diagnostic laboratories to obtain superior liver nuclei isolation using small samples from needle biopsy or dissection for practical use in a broad variety of applications and more accurate analysis.

In addition to research applications, economically isolated liver nuclei may lead to diagnostic applications through nuclear markers of viral diseases and cancer of the liver in human patients, as well as animals. Furthermore, the novel method could also be applicable to other tissues for diagnosis of cancer, infections, and immune-related diseases.

Competitive Advantage
Current methods of isolating nuclei from liver tissue require high centrifugal force utilizing specialized centrifuges that are expensive and bulky. In addition, the effectiveness and efficiency of the current method is limited due to damage to cell components from the high centrifugal force and extended spinning times (as long as 80 minutes) that are required for nuclei isolation.

This invention:
- Is superior to current methods by using much lower centrifugal force at shorter spinning times.
- Utilizes equipment that is smaller, affordable, and widely available in most laboratories.
- Results in nuclei isolation yields that are higher than current methods by enabling the use of small samples in conventional cone shaped centrifuge tubes.

Stage of development
This invention has been reduced to practice, and a standardized nuclei isolation kit for research and diagnostic laboratories has been developed.

Status
The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).