

**Technology**

Method using high pressure to hydrolyze methylene bonds in archived tissue samples

**Inventor**

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**Key Features**

- Low temperature, high pressure method of hydrolyzing methylene bonds in tissue samples
- Facilitates sample recovery and has the potential to reduce processing time
- Enables the use of FFPE tissue samples for proteomics biomarker studies
- Enables the use of FFPE tissue samples for immunohistochemical or enzyme histochemical studies

**Stage of Development**

Reduced to practice with successful demonstration of methodology

**Keywords**

Research and Diagnostic Tool

- Lab tool
- Tissue biopsy
- Pathology

**Patent Status**

Patent application has been filed

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## Pressure Assisted Molecular Recovery (PAMR) and Pressure Assisted Antigen Retrieval (PAAR)

(VA Reference No. 08-003)

*Highly efficient method using high pressure to hydrolyze methylene bonds in archived tissue samples*

**Technology**

The Department of Veterans Affairs' novel technology seeks to provide a new method in the use of high pressure to induce the hydration of cross-linked molecular aggregates that result from tissue fixation with formaldehyde, greatly reducing tissue biopsy processing time in a pathology lab.

**Description**

It has previously been shown that treatment of FFPE tissue samples with high temperature and altered pH increases the accessibility or recovery of proteins. In contrast, the unique methodology developed by the VA demonstrates that by using lower temperatures, but higher pressures, the methylene bonds can be hydrolyzed without thermally induced denaturation. An apparatus has been assembled using a high-pressure generator, a specimen holder, and a temperature modulator that can perform the hydrolysis on a test sample, and results have demonstrated that FFPE treated lysozyme can be recovered with the technique.

**Competitive Advantage**

Analysis of FFPE tissues from biopsies has been a challenge for proteomics biomarker studies and for identification of antigens and enzymes. In addition, FFPE tissues are limited candidates for MALDI mass spectrometry tissue profiling because these treatments hamper efficient ionization of the proteins and peptides.

**This invention:**

- Facilitates sample recovery from archived tissue samples in the clinical pathology setting for proteomic analysis.
- Has the potential to significantly reduce the processing time for tissue biopsies in the pathology lab.
- Enables the ability to correlate protein identification and molecular imaging when adjacent tissue sections are used.
- Doesn't denature the proteins making them unable to be recognized by antibodies and enzymes which can occur with current methods using high temperature.

**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).