# Mapping Melanoma Tumors with Gene Expression Analysis

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## ABSTRACT

Researchers at the University of California, Davis have developed a technique to precisely determine the boundary of melanoma tumors, in order to improve surgical outcomes through more accurate surgical planning and tissue preservation.

## FULL DESCRIPTION

Melanoma is the most dangerous form of skin cancer, affecting millions of people annually. It can quickly spread to the lymph nodes and become fatal if not treated. Melanoma tumors are surgically removed with relative ease; however, it is difficult to accurately determine the tumor's boundaries prior to surgery due to small, microscopic growths branching off from the main tumor. In many cases, excess amounts of healthy tissue surrounding the tumor are also removed to ensure that the entire tumor is removed. This is not ideal, particularly in more sensitive areas such as the face, hands, or arms where the preservation of healthy tissue and recovery time is a priority. In order to improve surgical success and patient outcomes, a new technique to identify melanoma tumor boundaries is required.

Researchers at the University of California Davis have developed a non-invasive method of identifying melanoma tumor boundaries by measuring gene expression in surrounding tissue. S100A8 and S100A9 gene expression can be used to precisely map the tumor boundary and determine the exact amount of tissue that should be surgically removed. To accomplish this, an adhesive patch is placed on the skin and analyzed for RNA markers of these genes through a chemical analysis. After the results have been analyzed, a map of the tumor boundaries is used as a reference in surgery to remove the necessary tissue. This minimizes removal of healthy tissue, which is particularly important for sensitive areas of skin.

## APPLICATIONS

- Clinical mapping of melanoma tumors prior to surgery.
- Monitoring melanoma tumor growth or recurrence.

## FEATURES/BENEFITS

- Non-invasive procedure.
- Minimizes the amount of healthy tissue removed in surgical procedures.
- Significantly more accurate compared to existing diagnostic techniques.

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Published Application | 20250075275 | 03/06/2025 | 2021-916 |

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**OTHER INFORMATION**

**KEYWORDS**

melanoma, tumor detection, gene expression, RNA analysis, dermatology, oncology

**CATEGORIZED AS**

- **Biotechnology**
  - Bioinformatics
  - Genomics
  - Proteomics
- **Imaging**
  - Medical
- **Materials & Chemicals**
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  - Diagnostics
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