# Utility of 31-gene expression profile test in identifying patients with T1 cutaneous melanoma at high risk of SLN positivity and recurrence

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## Background

- In T1a melanoma, there is documented concern about the accuracy of microstaging in predicting a patient's likelihood of SLNB positivity.[1-3]
- The majority of patients with T1 tumors and a positive SLN are stage IIIA, and although the benefits of adjuvant therapy in this cohort are less clear, the risk of recurrence is higher.[4,5] Therefore, additional prognostic tools could help select patients at highest risk of recurrence who may benefit from more aggressive monitoring (e.g., surveillance imaging).[6]
- The 31-gene expression profile (31-GEP) test has already been validated to identify patients with T1 tumors who can safely forego SLNB and who have low risk of recurrence.[1,7,8]

**Table 1. Logistic regression. The 31-GEP is the strongest predictor of SLN positivity in patients with T1 tumors**

| Variable | Odds Ratio | 95% CI |
|---|---|---|
| 31-GEP-Class 1A | Reference | -- |
| **31-GEP-Class 1B/2A** | **2.60** | **1.10 to 5.98*** |
| **31-GEP-Class 2B** | **9.02** | **3.26 to 25.80*** |
| Age | 0.99 | 0.97 to 1.02 |
| Location-extremity | Reference | -- |
| Location-head/neck | 1.30 | 0.51 to 3.16 |
| Location-trunk | 0.99 | 0.40 to 2.34 |
| Breslow thickness | 0.91 | 0.15 to 5.67 |
| Ulceration-absent | Reference | -- |
| Ulceration-present | 1.85 | 0.71 to 4.55 |
| Ulceration-unknown | 1.20 | 0.17 to 5.28 |
| Mitotic rate | 0.92 | 0.72 to 1.15 |
| Transected base-absent | Reference | -- |
| Transected base-present | 1.65 | 0.41 to 6.89 |
| Transected base-unknown | 5.75 | 0.34 to 278.2 |
| Regression-absent | Reference | -- |
| Regression status unknown | 0.41 | 0.15 to 1.05 |
| **Regression-present** | **0.18** | **0.04 to 0.59*** |
| Lymphovascular invasion-absent | Reference | -- |
| Lymphovascular invasion-unknown | 0.55 | 0.01 to 10.12 |
| Tumor-infiltrating lymphocytes-absent | Reference | -- |
| Tumor-infiltrating lymphocytes-unknown | 0.67 | 0.22 to 2.21 |
| Tumor-infiltrating lymphocytes-present | 0.86 | 0.31 to 2.58 |

## Objective

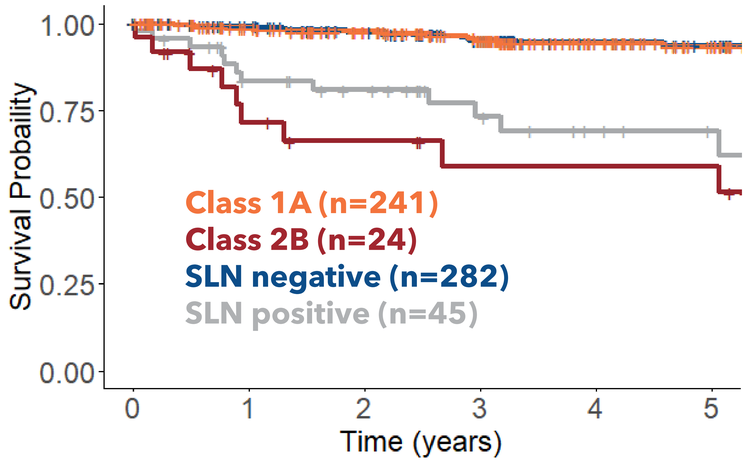
**Demonstrate that the 31-GEP offers significant prognostic value in addition to SLN status to help identify patients at the highest risk of tumor recurrence.**

## Methods

- A pooled cohort of 979 patients (1998-2019)[7,9-12] with T1 tumors was analyzed for SLN biopsy performance and SLN positivity rates. Clinical data such as patient age, tumor location as well as pathology findings including the Breslow thickness, tumor ulceration, mitotic rate, transected base, regression, lymphovascular invasion, and tumor-infiltrating lymphocytes were collected and analyzed through multiple logistic regression analysis. Additional Kaplan-Meier analysis was performed to estimate 5-year recurrence free survival (RFS).

## Results

**Figure 1. In T1 tumors, 31-GEP class result provides robust prognostic information**




- 327 (33.4%) patients underwent SLNB, and 45 (13.8%) were positive.
- Patients with a Class 2B result had numerically lower 5-year RFS rates than patients with a positive SLN biopsy (58.7% vs. 69.0%), while those with a Class 1A result had similar 5-year RFS rates as those of SLN negative patients (93.2% vs. 93.6%). Class 1B/2A 5-year RFS was 89.7%

**Table 2. A 31-GEP Class 2B presents a similar recurrence risk as a positive SLNB**

| Variable | Hazard ratio | 95% CI |
|---|---|---|
| Class 1A | Reference | -- |
| Class 1B/2A | 0.757 | 0.208-2.20 |
| Class 2B | 4.40 | 1.65-11.4 |
| SLN negative | Reference | -- |
| SLN positive | 4.76 | 1.98-11.3 |

## Clinical Impact

- The 31-GEP is an important factor that predicts SLN positivity in thin (T1) tumors and thereby the risk of recurrence in patients with thin (T1) tumors.
- 31-GEP by identifying patients who have higher risk of SLNB positivity and recurrence, helps identify patients who should be considered for more intensive management, such as SLNB, increased follow-up frequency, and imaging surveillance, to improve patient outcomes.
- The 31-GEP provides similar prognostic information as SLNB in T1 tumors, but without the complications of surgery.

## Conclusions

- The 31-GEP was the strongest predictor of a positive SLN in patients with T1 tumors and confirms the uncertainty in the accuracy of clinicopathologic microstaging alone for predicting SLN positivity.
- In patients with T1 cutaneous melanoma undergoing SLN biopsy, the 31-GEP strongly predicted SLN positivity and provides prognostic information similar to SLN biopsy.

## References

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