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Predictive Biomarkers for Monoclonal Antibody Therapy Response in Oral Squamous Cell Carcinoma: A Systematic Review

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INTRODUCTION & AIM

- Oral squamous cell carcinoma (OSCC) has poor survival despite new therapies.
- Monoclonal antibodies (mAbs) such as immune checkpoint inhibitors and anti-EGFR agents are increasingly used, but responses vary [1].
- Predictive biomarkers are needed to guide treatment [2,3].
- This review evaluates recent evidence on biomarkers linked to mAbs outcomes in OSCC, aiming to support personalized therapy.

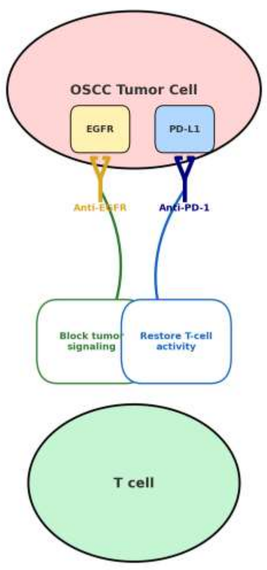

Figure 1. Mechanism of Monoclonal Antibody Therapy in OSCC.

METHOD

- **Search strategy:** PRISMA-guided search of PubMed, ScienceDirect, and Web of Science.
- **Time frame:** Studies published in the last 5 years.
- **Population:** Adults with oral squamous cell carcinoma (OSCC) treated with monoclonal antibodies (mAbs).
- **Inclusion criteria**: English-language studies reporting associations between biomarkers and clinical outcomes.
- **Screening:** 502 records identified → 5 studies included.

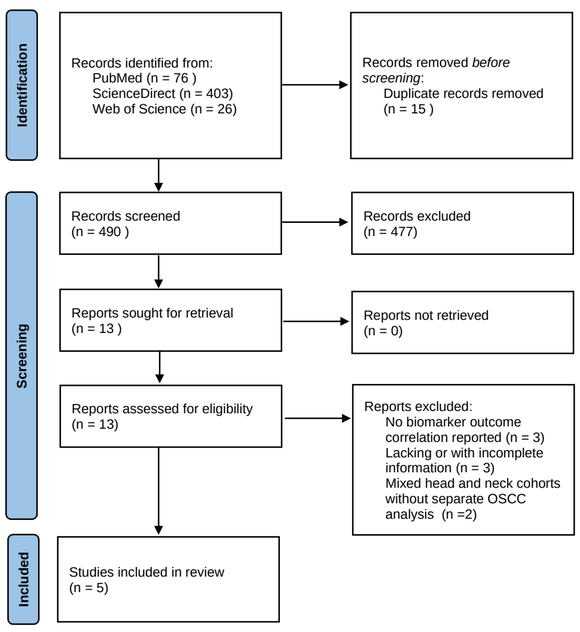

Figure 2. PRISMA flow diagram

RESULTS & DISCUSSION

- NLR (Neutrophil-to-Lymphocyte Ratio): A post-treatment NLR ≥5 was linked to poorer survival with nivolumab in recurrent OSCC [4].
- Genomic alterations: EGFR mutations and 11q13 amplification were associated with reduced progression-free survival and lack of clinical benefit from anti-PD-1 therapy [5].
- PD-L1 expression: Higher PD-L1 CPS (>10) predicted higher major pathological response (MPR) and pathological complete response (pCR) with camrelizumab-, toripalimab-, and apatinib-based regimens [6-8].
- Tertiary lymphoid structures (TLS): Presence correlated with improved response to toripalimab plus chemotherapy [7].

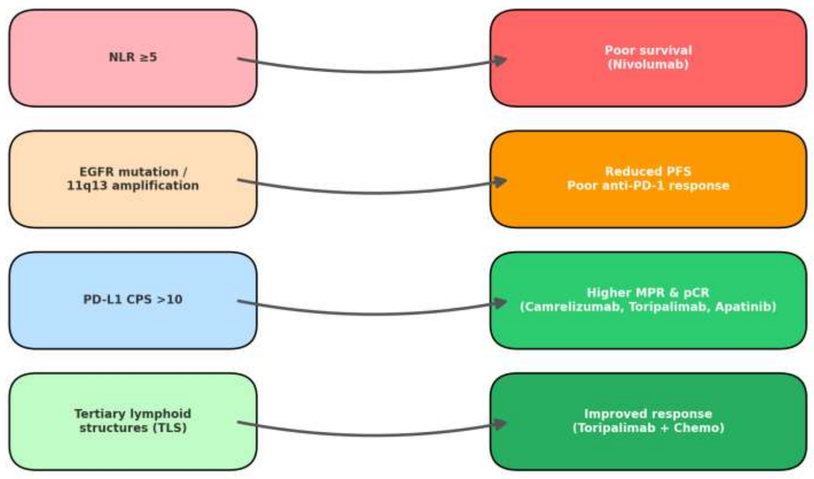

Figure 3. Predictive biomarkers in OSCC: High NLR and EGFR/11q13 alterations predict poor outcomes, while PD-L1 CPS >10 and TLS indicate better response to monoclonal antibody therapy.

CONCLUSION

- PD-L1 expression, tertiary lymphoid structures, NLR, and genomic alterations show potential as predictive biomarkers for monoclonal antibody therapy in OSCC.
- PD-L1 CPS is the most consistently reported marker of treatment benefit.
- Evidence is limited by small sample sizes and heterogeneous study designs.
- Larger, prospective trials are required to validate biomarker-driven patient selection and improve clinical outcomes

FUTURE WORK / REFERENCES

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