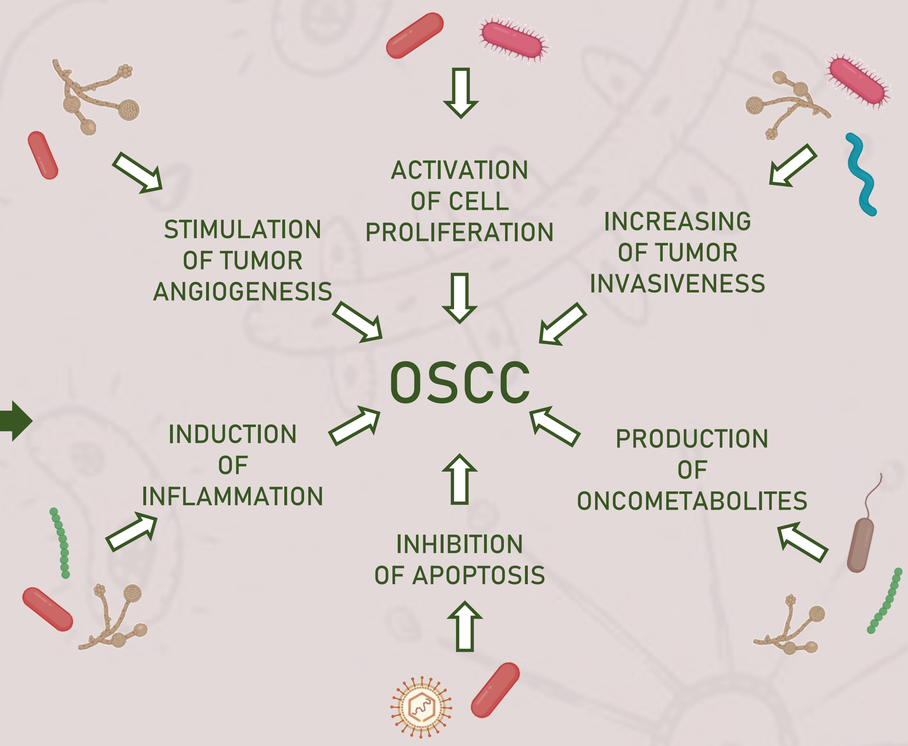
ORAL MICROBIOTA IN PATIENTS WITH ORAL SQUAMOUS CELL CARCINOMA

Daniela Gachová
Zdeněk Daněk
Ctirad Macháček
Petra Bořilová Linhartová

BACKGROUND

- Oral squamous cell carcinoma (OSCC) is the most common malignancy in the head and neck region and, despite advances in treatment, is often diagnosed only at a late stage and has a poor prognosis.
- Oral carcinogenesis is a multifactorial process involving the effect of the exposome and subsequent cytogenetic and epigenetic changes in keratinocytes.
- External risk factors include tobacco, alcohol abuse, and malhygiene, which can affect the composition of the oral microbiota.[1]
- Oral microbiota (bacteriome, mycobiome, and virome) has been associated with oral cancer through a wide range of mechanisms[2], but the relationship has not been thoroughly characterized.



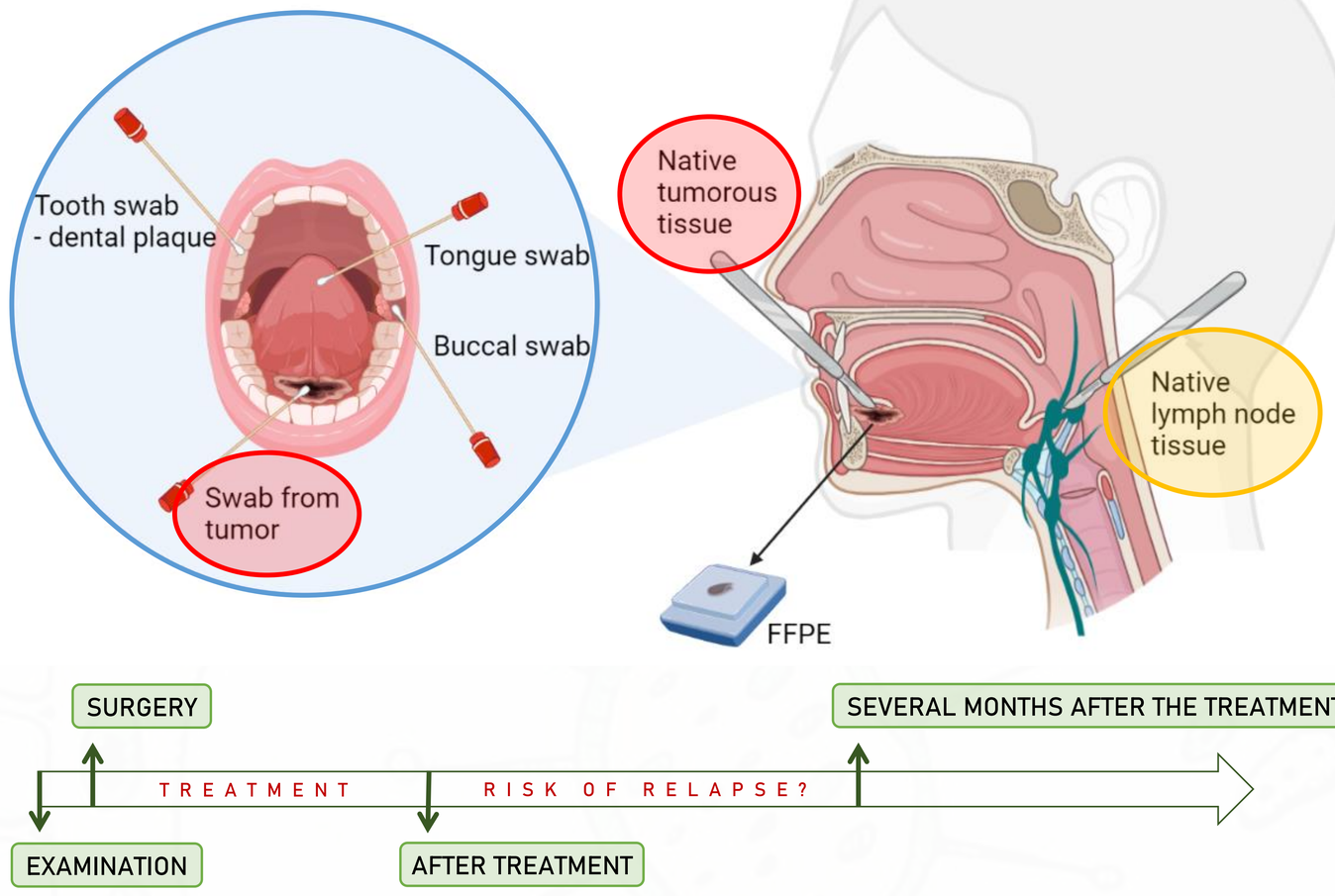
HYPOTHESIS

- Oral microbiota is linked to OSCC and varies in localization, in the depth of a tumor, and also between patients with different dentition. The dynamic changes in microbiota composition might be detected, which may be used as predictive tools. There is a correlation between microbiota in the oral tumoral tissue and metastatic affected lymph nodes.

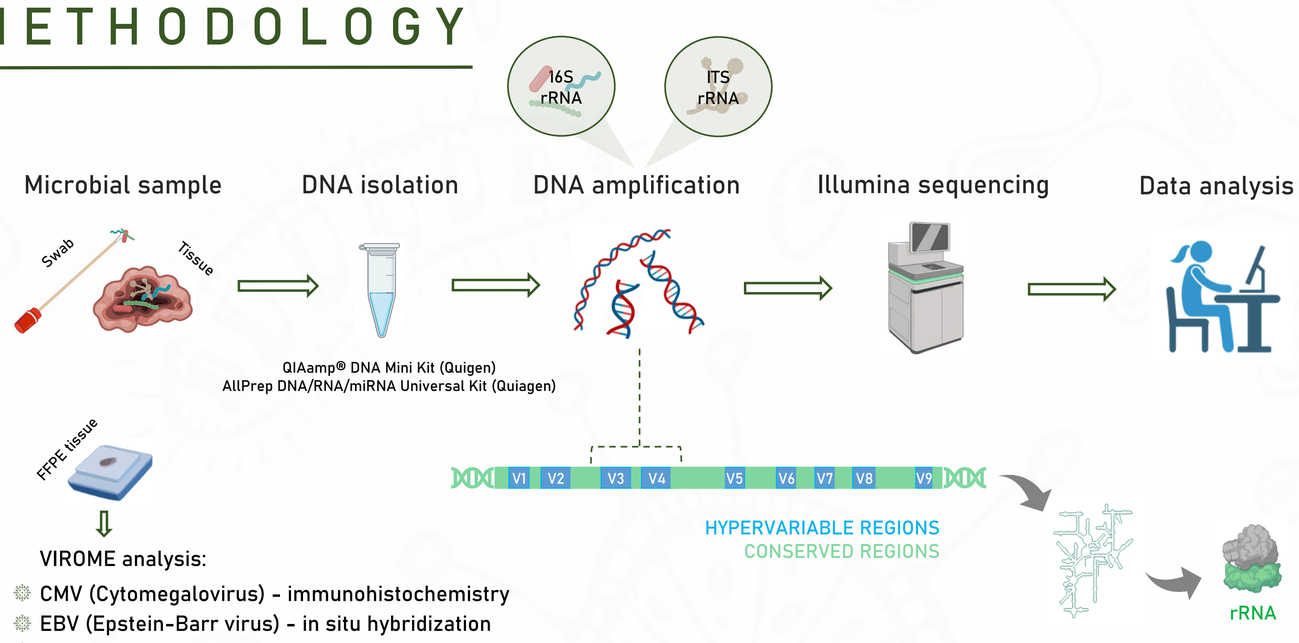
AIMS

- To investigate the composition of oral microbiota in different localizations of the oral cavity.
- To compare the intra- and extratumoral microbiota.
- To prove/disprove the presence of microbial DNA in cervical lymph nodes affected by metastasis.
- To compare the oral microbiota in OSCC patients in a view of the condition of their dentition (teeth-containing vs. toothless).
- To investigate the changes in the oral microbiome during treatment.

SAMPLE COLLECTION



METHODOLOGY



VIROME analysis:

- CMV (Cytomegalovirus) - immunohistochemistry
- EBV (Epstein-Barr virus) - in situ hybridization
- HPV (Human papillomavirus) - in situ hybridization

EXPECTED OUTCOMES

- This research will lead to a deeper knowledge of the etiopathogenesis of OSCC and factors affecting the progression of tumor growth.
- The investigation of changes in oral microbiota could be potentially useful as a diagnostic and prognostic/predictive tool, especially when the risk of relapse and/or metastasis is considered.

OSCC PROJECT

- The project is to perform a complex investigation of OSCC etiopathogenesis to find suitable predictive tools that could contribute towards improving personalized therapeutic approaches.

MICROBIOME | METATRANSCRIPTOME AND METABOLOME | EXPRESSION OF SPECIFIC GENES | EPIGENETIC MODIFICATIONS | SOMATIC MUTATIONS

ACKNOWLEDGEMENT

This work/Part of the work was carried out with the support of RECETOX Research Infrastructure (ID LM2018121, MEYS CR, 2020-2022). Supported by Ministry of Health of the Czech Republic, grant nr. NU-20-08-00205 and by project provided by University Hospital Brno, Ministry of Health Czech Republic – RVO (FNBr, 65269705).

REFERENCES

1) Kakabadze MZ, Paresishvili T, Karalashvili L, Chakhunashvili D, Kakabadze Z. Oral microbiota and oral cancer: Review. Oncol Rev. 2020 Jul 6;14(2):476. doi: 10.4081/oncol.2020.476

2) Vyhnalova T, Danek Z, Gachova D, Linhartova PB. The Role of the Oral Microbiota in the Etiopathogenesis of Oral Squamous Cell Carcinoma. Microorganisms. 2021 Jul 21;9(8):1549. doi: 10.3390/microorganisms9081549

Created in BioRender.com

daniela.gachova@recetox.muni.cz