

Helixco Cavity

Jaewoong Lee

2020-08-24

Contents

| | | |
|----------|-------------------------------|----------|
| 1 | Introduction | 3 |
| 1.1 | Dental Cavity | 3 |
| 1.2 | Microbiome | 3 |
| 2 | Materials | 3 |
| 2.1 | Microbiome analysis | 3 |
| 3 | Methods | 3 |
| 3.1 | Docker | 3 |
| 3.2 | QIIME 2 | 3 |
| 3.3 | Scikit-learn | 3 |
| 4 | Results | 3 |
| 5 | Discussion | 3 |
| | References | 3 |

List of Tables

List of Figures

| | | |
|---|---|---|
| 1 | Sagittal and cross-sectional sections through a permanent molar (Loesche, 1986) | 3 |
|---|---|---|

1 Introduction

1.1 Dental Cavity

Dental cavity is one of the most common bacterial infections in humans. *Streptococcus mutans* in the acquired enamel pellicle have a main role in human dental cavity (Loesche, 1986; Alaluusua & Renkonen, 1983).

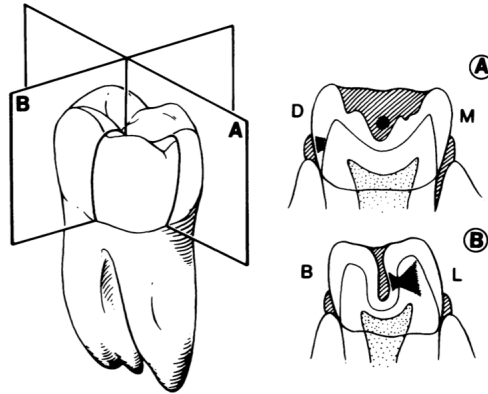


Figure 1: Saggital and cross-sectional sections through a permanent molar (Loesche, 1986)

1.2 Microbiome

Microbiome refers the genome of microbial symbionts which live inside and on human (Turnbaugh et al., 2007). Microbiome is highly personalized, and gives effects to human health.

2 Materials

2.1 16S rRNA Analysis

3 Methods

3.1 Docker

Docker is light-weight linux containers for consistent development and deployment (Merkel, 2014).

3.2 QIIME 2

QIIME 2 is a powerful, extensible, and decentralized microbiome analysis package with a focus on data and analysis transparency.

3.3 Scikit-learn

Scikit-learn is a simple and efficient tools for predictive data analysis (Pedregosa et al., 2011; Buitinck et al., 2013).

4 Results

5 Discussion

References

Alaluusua, S., & Renkonen, O.-V. (1983). *Streptococcus mutans* establishment and dental caries experience in children from 2 to 4 years old. *European Journal of Oral Sciences*, 91(6), 453–457.

- Buitinck, L., Louppe, G., Blondel, M., Pedregosa, F., Mueller, A., Grisel, O., ... Varoquaux, G. (2013). API design for machine learning software: experiences from the scikit-learn project. In *Ecml pkdd workshop: Languages for data mining and machine learning* (pp. 108–122).
- Loesche, W. J. (1986). Role of streptococcus mutans in human dental decay. *Microbiological reviews*, 50(4), 353.
- Merkel, D. (2014). Docker: lightweight linux containers for consistent development and deployment. *Linux journal*, 2014(239), 2.
- Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., ... Duchesnay, E. (2011). Scikit-learn: Machine learning in Python. *Journal of Machine Learning Research*, 12, 2825–2830.
- Turnbaugh, P. J., Ley, R. E., Hamady, M., Fraser-Liggett, C. M., Knight, R., & Gordon, J. I. (2007). The human microbiome project. *Nature*, 449(7164), 804–810.