

CHARACTERISATION OF FOUR CLINICAL ISOLATES OF *STREPTOCOCCUS PYOGENES* RECOVERED FROM DIFFERENT SITES OF INFECTION UNDER HUMAN PLASMA SUPPLEMENTATION.

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BACKGROUND

Streptococcus pyogenes is a human-specific pathogen, highly prevalent worldwide and causing approximately 750 million infections per year. Throat and skin epithelia are the primary ecological niches of *S. pyogenes*. Invasive disease is a relatively rare outcome of *Streptococcus pyogenes* infection but results in high mortality rates¹. The aims of this study were i) to investigate the response of *Streptococcus pyogenes* isolated from different body sites to different human plasma concentrations and ii) to carry out comparative genomics.

METHODS

Four *Streptococcus pyogenes* isolates were recovered from four different sites of infection: blood, skin lesion, oropharynx and vaginal secretion. For phenotypic characterisation, the isolates were grown for 24 hours at 37°C in Todd-Hewitt broth supplemented with the following human plasma concentrations: 0%, 1%, 5%, 10% and 20%. Whole genome sequencing was performed for the four isolates. Annotation and multiple genome alignment were carried out using the RAST server² and the Progressive Mauve algorithm³, respectively. The phage search tool PHAST was used to determine the presence of phages in the four isolates genomes.

CONCLUSIONS

- All four isolates presented different *emm* types, as indicated by genomics, but three of the four had a similar *emm* gene cluster (Table 1);
- The isolates displayed phenotypic differences as a function of human plasma concentrations (Figure 1);
- Multiple genome alignment revealed a high number of rearrangements amongst the isolates (Figure 2);
- Three complete and 1 incomplete phages were found in the vaginal secretion isolate, 2 complete and 1 incomplete phages in the blood isolate, 2 complete and 3 incomplete phages in the oropharynx isolate and only 1 incomplete phage in the skin lesion isolate (Figure 3)

REFERENCES

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RESULTS

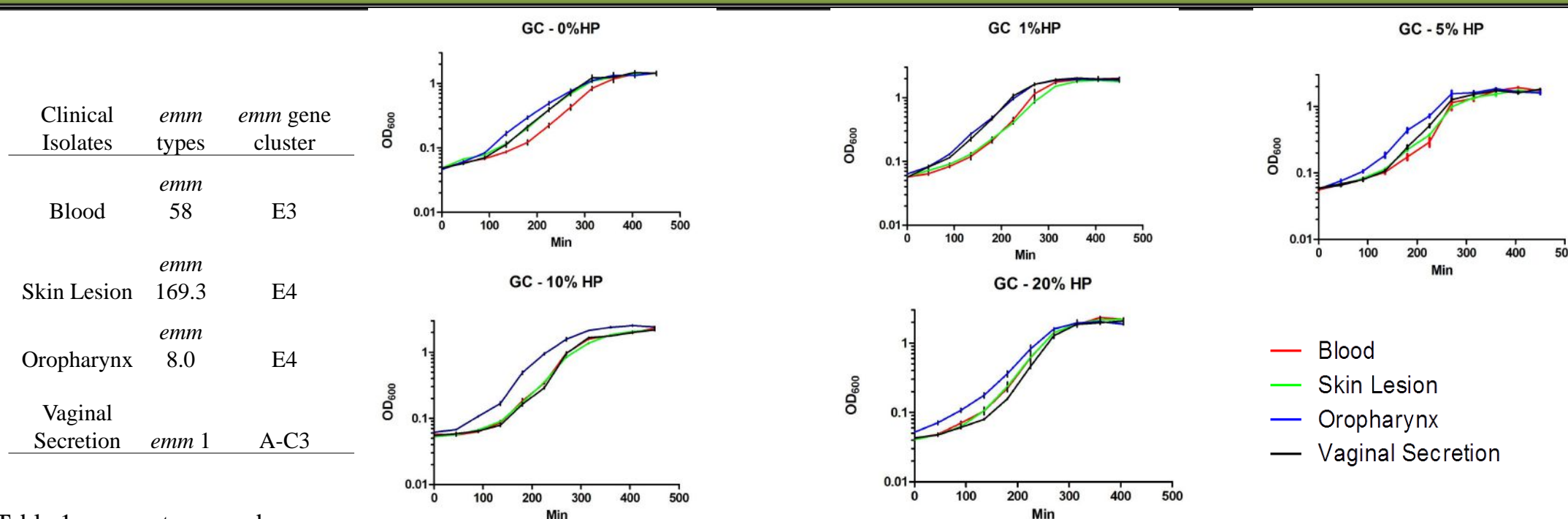


Figure 1. – Growth curves in TH broth in the presence and absence of human plasma.

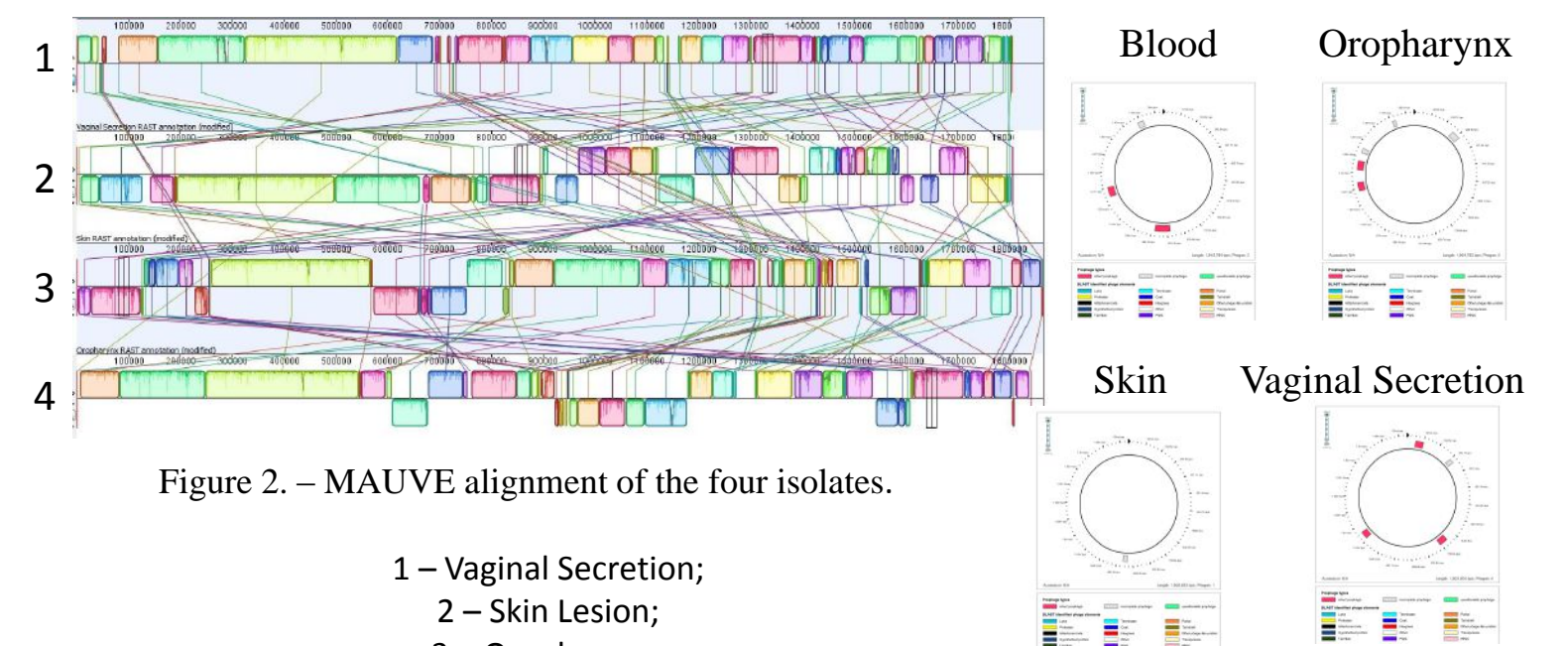


Figure 2. – MAUVE alignment of the four isolates.

- 1 – Vaginal Secretion;
- 2 – Skin Lesion;
- 3 – Oropharynx;
- 4 – Blood.

Figure 3. – PHAST analysis

Table 1. – *emm* types and *emm* gene