

Utility of PneumoStrip, a Reverse-Hybridization Nylon Strip Assay prototype, for *Streptococcus pneumoniae* serotyping

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Background

The World Health Organization has encouraged countries to conduct appropriate vigilance programs based on *Streptococcus pneumoniae* serotyping to assess antipneumococcal vaccination strategies. Traditional serotyping methods were cumbersome, as a result a new prototype (PneumoStrip) has been developed in a collaborative project by the Microbiology Service of Donostia University Hospital along with the biotechnology company Operon SL (Zaragoza, Spain).

PneumoStrip is a new methodology multiplex PCR-based reverse line blot hybridization able to identified 42 of the nearly 100 pneumococcal serotypes described up to date (Table 1).

The aim of f this study was to evaluate the PCR/hybridization assay prototype (PneumoStrip) .

Material and Methods

Prospective double-blind study comparing the PneumoStrip prototype with the Quellung reaction (gold-standard technique) for *S. pneumoniae* serotype identification.

The first 119 pneumococci (9 invasive and 110 non-invasive) isolated from clinical samples at Donostia University Hospital during the first months of 2015 were investigated. Moreover 4 viridians group streptococci were included to assess technique specificity.

The PneumoStrip kit contains: Strips, PCR reagents (Taq polymerase, primers, PCR reagents), denaturant, hibridation buffer, washing buffer 1, conjugated, washing buffer 2, templates for serotypes identification and instructions for use.

The work flow for PneumoStrip development is shown in Figure 1.

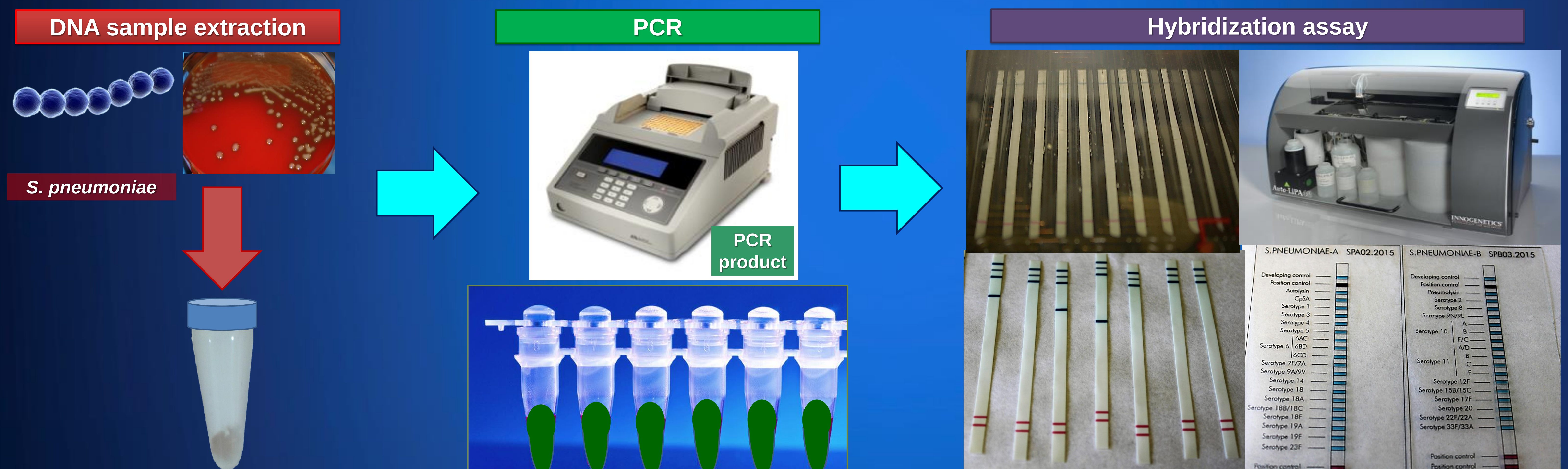


Table 1. The 42 different serotypes detected and differentiated by PneumoStrip

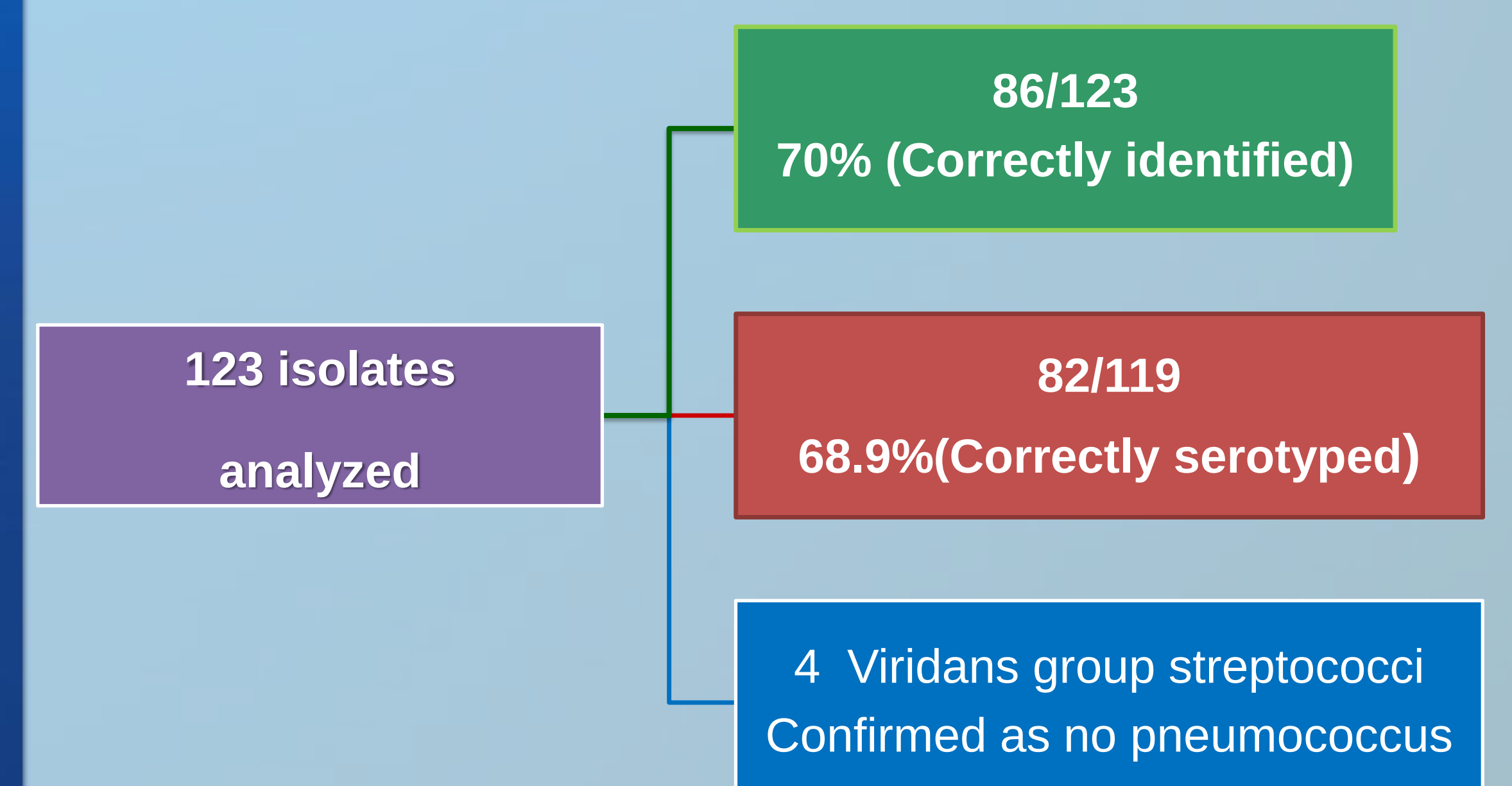
VACCINE	SEROTYPES
PCV7	4, 6B, 9V, 14, 18C, 19F, 23F
PCV10	1, 4, 5, 6B, 7F, 9V, 14, 18C, 19F, 23F
PCV13	1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F
PCV23	1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, 33F.

Conclusions

- The PneumoStrip reverse-hybridization strip assay is a good tool for pneumococcal serotyping.
- The main advantages of this technique: simplicity, no experienced staff needed and working in batches of samples.
- Addition of more serotypes is possible and are being incorporated in a second prototype.

Figure 1. PneumoStrip workflow

Results



- 37 isolates (including 2 non-encapsulated pneumococci) were confirmed as pneumococci but could not be serotyped because were serotypes, identified by Quellung reaction, not included in this first prototype.