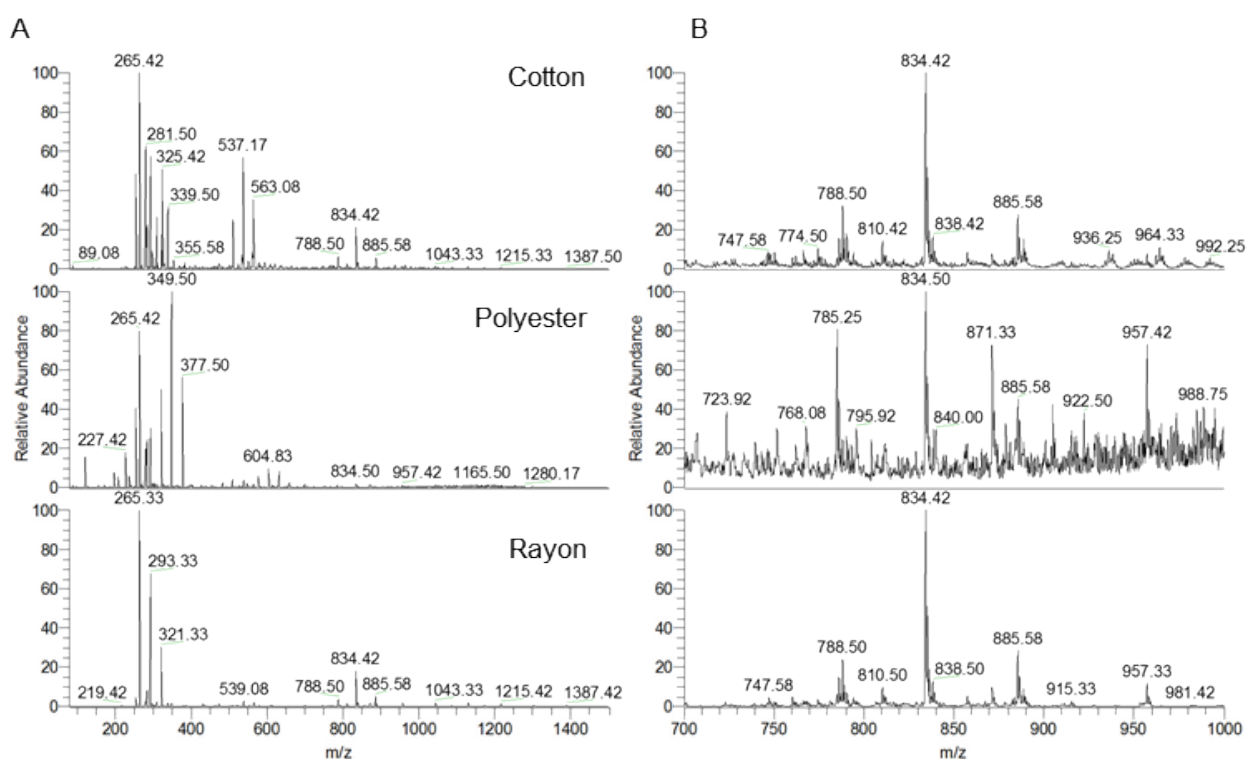


## Supplemental Information

### Detection of strep throat causing bacterium directly from medical swabs by touch spray - mass spectrometry

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Strep throat causing *Streptococcus pyogenes* was detected in vitro and in simulated clinical samples by performing touch spray ionization - mass spectrometry. MS analysis took only seconds to reveal characteristic bacterial and human lipids. Medical swabs were used as the substrate for ambient ionization. This work constitutes the initial step in developing a non-invasive MS-based test for clinical diagnosis of strep throat. It is limited to the single species, *S. pyogenes*, which is responsible for the vast majority of cases. The method is complementary to and, with further testing, a potential alternative to current methods of point-of-care detection of *S. pyogenes*.

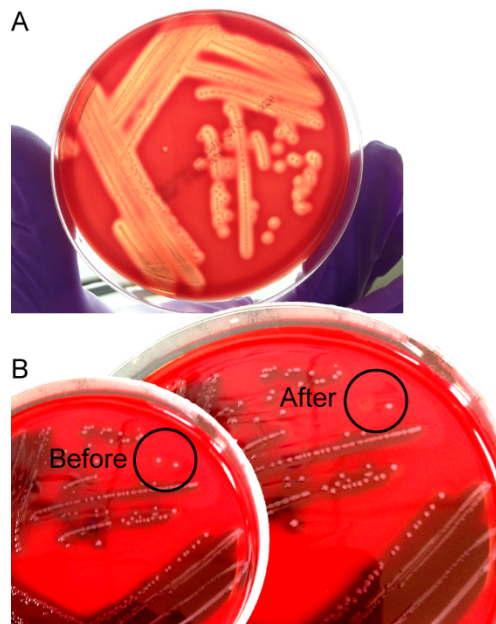


Supplemental Fig 1. (A) Negative mode TS-MS spectra of mouse brain sampled with various swab materials: cotton (top), polyester (middle), and rayon (bottom). (B) Corresponding mass spectra of GPL region ( $m/z$  700-1000) for swab materials.



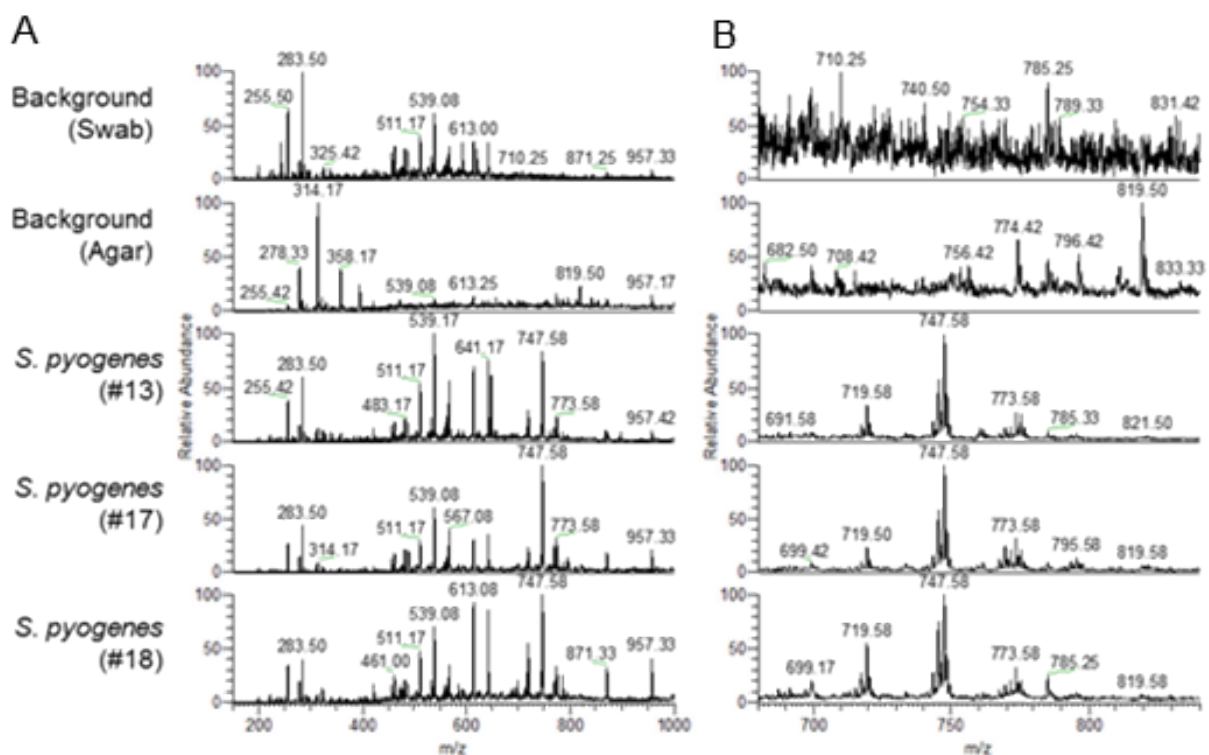
Supplemental Fig 2. Photograph of a rayon medical swab during data acquisition oriented vertically.

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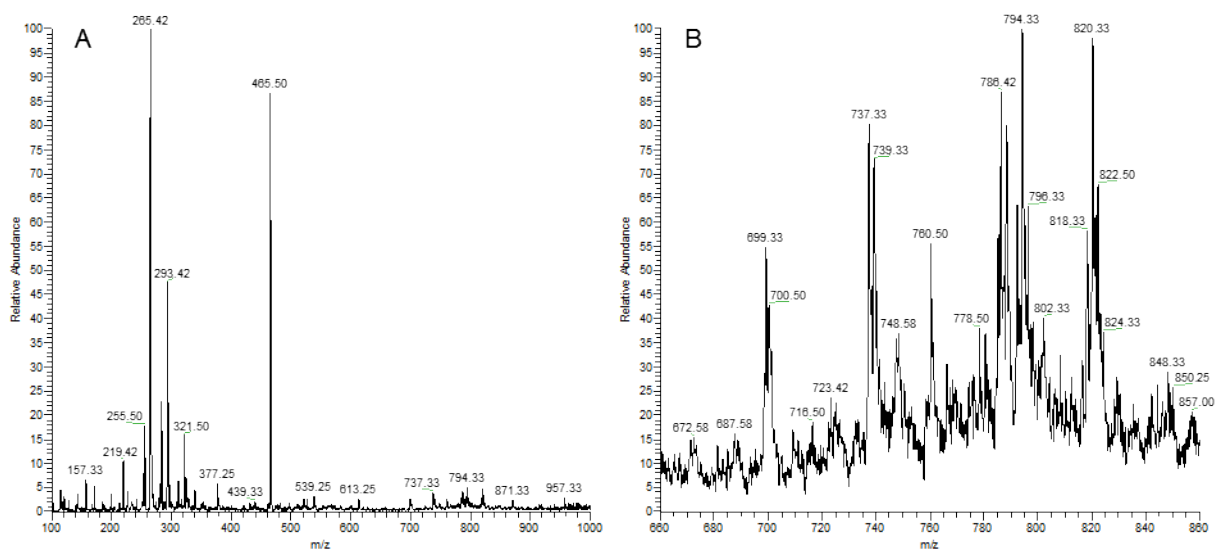


Supplemental Fig 3. (A) Beta-hemolysis of *S. pyogenes* cultured (48 h) on TSA with 5% sheep blood (B) Sampling of a single, isolated colony of *S. pyogenes* (circled) – areas of beta-hemolysis appear dark due to photography.

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Supplemental Fig 4. (A) Negative mode TS-MS spectra of swab background, agar background, and triplicate *S. pyogenes* measurements acquired using a rayon medical swab. (B) Zoom of GPL region corresponding to the background and *S. pyogenes* samples.



Supplemental Fig 5. (A) Negative mode TS-MS of human saliva containing cheek epithelial cells (B) Zoom of the phospholipid region (*m/z* 660-860).