**Supplement**

**Table 1. Prediction performance of ML model during 2020/08-2020/10.** Prediction performance was inferior between probability 0.4-0.48.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Probability<0.40  | 0.4-0.48 | >0.48 |
| accuracy | 0.9857 | 0.88  | 0.94 |

**Figure 1. Illustration of grey zone definition in this study.** Probability range between 0.40 to 0.48 was defined as grey zone.



**Table 2. Detailed peak numbers of the MALDI-TOF mass spectra in different groups.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Minimum | First Quartile | Median | Third Quartile | Maximum |
| MRSA, correct | 96 | 116 | 124.00 | 134.00 | 190 |
| Grey zone | 101 | 118.5 | 126 | 133.75 | 166 |
| MSSA, correct | 87 | 113 | 120 | 130 | 166 |
| MRSA, incorrect | 106 | 115 | 124 | 130 | 152 |
| MSSA, incorrect | 95 | 120 | 127.5 | 137.75 | 192 |

**Table 3. Literature review of molecular typing of *S. aureus* in Taiwan.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time | Research | Strain | Population | Sample size | Top 5 MLST | Other MLST |
| 2012 | Chen et al1 | MSSA | * Community-onset infection
* 2 medical centers (Tri-Service General Hospital and Kaohsiung Medical University Hospital).
* a four-month collection period in 2006.
 | 34 | ST188ST7ST97ST12ST15 | 7 (20.6%)6 (17.6%)4 (11.8%)4 (11.8%)3 (8.8%) | 10 (29.4%) |
| 2019 | Chen et al2 | MSSA | * Infected children (< 18y/o), excluding neonate
* Chang Gung Memorial Hospital, Linkou
* January 1, 2015 to December 31, 2015
 | 59 | ST15ST188ST7ST508ST5 | 6 (10.2%)5 (8.5%)4 (6.8%)3 (5.1%)2 (3.4%) | 39(66.1%) |
| 2014 | Ho et al3 | MSSA | * Blood culture of different patients
* China Medical University Hospital, Taiwan
* July 2008 to December 2009 for MSSA
* July to December 2008 for MRSA
 | 14 | ST15ST59ST188ST12ST6 | 4(28.6%)3(21.4%)3(21.4%)2(14.3%)2(14.3%) | - |
| MRSA | 22 | ST5ST239ST59 | 10(45.4%)7(31.8%)5(22.7%) | - |
| 2019 | Wu et al4 | MRSA | * Nasal swabs from patients >18y/o visiting the emergency department and health care workers in the ED and intensive care unit (ICU)
* 2 regional hospitals in Changhua
* February to June 2015
 | 36 | ST59 ST45 ST239 ST508 ST5  | 16(44.4%)11(30.5%)3(8.3%)3(8.3%)1(2.7%) | 2 (5.5%) |
| 2019 | Peng et al5 | MRSA | * MRSA isolates from cellulitis and from osteomyelitis patients.
* Chang Gung Memorial Hospital, Chiayi
* 2016 to 2018
 | 221 | ST59ST8ST239ST45ST30 | 91(41.2%)46(20.8%)35(15.8%)13(5.9%)11(5.0%) | 25(11.3%) |
| 2012 | Wang et al6 | MRSA | * blood culture of different patients
* 9 medical centers, including in northern (hospitals N1, N2, N3), central (hospitals C1, C2, C3), and southern (hospitals S1, S3) and one in eastern (hospital E1) part of Taiwan.
* March to August, 2003
 | 157 | ST239ST59ST241ST5ST573 | 99(63.0%)27(17.2%)12(7.6%)9(5.7%)4(2.5%) | 6 (3.8%) |

**Reference**

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