

Complementary data

Table S1 Best-tuned parameter values for each model of XGBoost.

| mtry | trees | min_n | tree_depth | learn_rate | sample_size |
|------|-------|-------|------------|------------|-------------|
| 7 | 1407 | 4 | 6 | 0.0095 | 0.7304 |

Table S2 Contingency table for categorised predictions (independently > 666 mg*g/L and < 939 mg*h/L AUCs from test and external dataset using XGBoost daptomycin AUC prediction model), applicable in the case of a *Staphylococcus aureus* infection for a MIC at breakpoint of 1.

| TEST SET (n = 1188) | | | |
|----------------------------|-------------------------------|-------------------------------|--|
| | Reference AUC < 666 mg*h/L | Reference AUC > 666 mg*h/L | Performances for AUC > 666 mg*h/L: Se 97.70 % Sp 95.82 % PPV 97.82 % PNV 95.59 % |
| Predicted AUC < 666 mg*h/L | 390 | 18 | |
| Predicted AUC > 666 mg*h/L | 17 | 763 | |
| | | | |
| | Reference AUC < 939 mg*h/L | Reference AUC > 939 mg*h/L | Performances for AUC < 939 mg*h/L: Se 95.27 % Sp 93.98 % PPV 95.13 % PNV 94.16 % |
| Predicted AUC < 939 mg*h/L | 625 | 32 | |
| Predicted AUC > 939 mg*h/L | 31 | 500 | |
| EXTERNAL DATASET (n = 194) | | | |
| | Reference AUC < 666 mg*h/L | Reference AUC > 666 mg*h/L | Performances for AUC > 666 mg*h/L: Se 100 % Sp 16.67 % PPV 97.41 % PNV 100 % |
| Predicted AUC < 666 mg*h/L | 1 | 0 | |
| Predicted AUC > 666 mg*h/L | 5 | 188 | |
| | | | |
| | Reference AUC < 939 mg*h/L | Reference AUC > 939 mg*h/L | Performances for AUC < 939 mg*h/L: Se 78.00 % Sp 100 % PPV 100 % PNV 92.90 % |
| Predicted AUC < 939 mg*h/L | 39 | 0 | |
| Predicted AUC > 939 mg*h/L | 11 | 144 | |

10 **Table S3** Performances of the machine learning models in the training and testing datasets to estimate
 11 daptomycin AUCs obtained from two samples.

| Daptomycin q.d. 2 samples | | | | | | |
|--|--------------|-------------|--------------|-------------|--------------|-------------|
| | Training_glm | Testing_glm | Training_rf | Testing_rf | Training_svm | Testing_svm |
| RMSE, mg*h/L ^a | 88.2 | 86.2 | 80.3 | 79.9 | 88.2 | 85.9 |
| R ² ^a | 0.981 | 0.981 | 0.984 | 0.984 | 0.981 | 0.982 |
| Relative MPE, % | 1.25 | 0.95 | 0.93 | 0.65 | 1.22 | 0.93 |
| Relative RMSE, % | 10.8 | 9.67 | 8.27 | 7.98 | 10.9 | 9.73 |
| Number of MPE of the $\pm 20\%$ interval n | 178 (5.01 %) | 47 (3.96 %) | 101 (2.84 %) | 28 (2.36 %) | 180 (5.08 %) | 50 (4.21 %) |

12 AUC, area under the curve; MPE, mean prediction error; RMSE, root mean square error; glm, generalized
 13 linear model; rf, random forest; svm, support vector machine.

14 ^aValues obtained after 10-fold cross-validation. ^b SDs obtained after 10-fold cross-validation