**S8 Table:** Results from GUESSFM analysis of amino acids, for varying values of nexp parameter.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| nexp | Size of best models | Best models (in order of posterior probability) | Posterior probability of model | Best amino acids | Marginalposterior probability of inclusion of amino acid | Predictors tagged (r2≥0.9604) by best amino acids |
|  |  |  |  |  |  |  |
| 1 | 7 | B45T+***DPB11G***+DQA175E+DQB26G+DRB67I+DRB74R+DRB78Y | 0.9954 | DRB74R | 1.0000 | DRB74RDRB77TDRB77NDQA53Q |
| DRB78Y | 1.0000 | DRB78YDRB78V |
| DRB67I | 1.0000 | DRB67I |
| DQA175E | 1.0000 | DQA175E |
| DQB26G | 1.0000 | DQB26GDQB74S |
| ***DPB11G*** | 1.0000 | ***DPB11G***DPB11L |
| B45T | 0.9980 | B45T |
|  |  |  |  |  |  |  |
| 2 | 998999998999989 | B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.27A+DQB66D+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B45T+B9Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DQA34E+DQB.270+DQB74E+***DRB74L***B45T+B9Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQB.27A+DQB66D+DRB47Y+***DRB74L***A76A+B9Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DQA34E+DQB.27A+DQB66D+***DRB74L***B9Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQB.270+DQB38V+DRB47Y+***DRB74L*** | 0.24410.11800.05000.04590.03350.03340.02520.02390.01800.01690.01680.01570.01390.01240.0114 | ***DPB11G*** | 1.0000 | ***DPB11G***DPB11L |
| ***DRB74L*** | 0.9999 | ***DRB74L*** |
| B9Y | 0.9995 | B9Y |
| ***C156R*** | 0.9983 | ***C156R*** |
| DQA34E | 0.9915 | DQA34EDQA34Q |
| DQB.270 | 0.9743 | DQB.270DQB.210DQB.180DQB.100DQB.90DQB.60DQB.50DQB.40 |
| C113Y | 0.9544 | C113YC113H |
| DPB84V | 0.9384 | DPB84VDPB215T |
| DQB38V | 0.7690 | DQB38VDQB38ADQB77RDQB77T |
|  |  |  |  |  |  |  |
| 3 | 1010910910101010810109 | B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B45T+B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B45T+B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.27A+DQB66D+***DRB74L***A76A+B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.27A+DQB66D+***DRB74L***B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L*** | 0.20590.11570.06710.03870.03240.02420.01950.01910.01860.01550.01470.01270.0126 | ***DPB11G*** | 1.0000 | ***DPB11G***DPB11L |
| ***DRB74L*** | 0.9999 | ***DRB74L*** |
| ***C156R*** | 0.9999 | ***C156R*** |
| DQA34E | 0.9992 | DQA34EDQA34Q |
| B9Y | 0.9988 | B9Y |
| DQB.270 | 0.9986 | DQB.270DQB.210DQB.180DQB.100DQB.90DQB.60DQB.50DQB.40 |
| DPB84V | 0.9976 | DPB84VDPB215T |
| C113Y | 0.9819 | C113YC113H |
| DPB65I | 0.9019 | DPB65IDPB65L |
| DQB38V | 0.8437 | DQB38VDQB38ADQB77RDQB77T |
|  |  |  |  |  |  |  |
| 4 | 10111110119111111111110 | B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA175E+DQA50L+DQB.27A+DQB38VA76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA175E+DQB.27A+DQB38V+***DRB74L***B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA34E+DQB.270+DQB74E+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA175E+DQA50L+DQB.27A+DQB74EA76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQB13G+DQB38V+DRB13H+***DRB74L***A76A+B45T+B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA175E+DQA50L+DQB.27A+DQB38VA76A+B45T+B9Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQB13G+DQB38V+DRB13H+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB84V+DQA34E+DQB.270+DQB38V+***DRB74L*** | 0.05490.03740.03600.03080.02440.01940.01630.01370.01310.01130.01100.0103 | ***DPB11G*** | 1.0000 | ***DPB11G***DPB11L |
| DPB84V | 0.9974 | DPB84VDPB215T |
| B9Y | 0.9862 | B9Y |
| ***C156R*** | 0.9789 | ***C156R*** |
| DPB65I | 0.9240 | DPB65IDPB65L |
| C113Y | 0.8582 | C113YC113H |
| ***DRB74L*** | 0.7765 | ***DRB74L*** |
| DQB38V | 0.7172 | DQB38VDQB38ADQB77RDQB77T |
| DQA34E | 0.5891 | DQA34EDQA34Q |
| DQB.270 | 0.5763 | DQB.270DQB.210DQB.180DQB.100DQB.90DQB.60DQB.50DQB.40 |
| A76A | 0.5028 | A76A |
|  |  |  |  |  |  |  |
| 5 | 11101111111211 | A76A+B9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA175E+DQA50L+DQB.27A+DQB38VB9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA175E+DQB.27A+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA50L+DQB.27A+DQB38V+***DRB74L***A76A+B70K+B9Y+C113Y+***C156R***+DPB35Y+DPB76V+DPB8L+DQA34E+DQB.270+DQB38V+***DRB74L***A76A+B9Y+C113Y+***C156R***+***DPB11G***+DPB65I+DPB84V+DQA175E+DQA50L+DQB.27A+DQB38V | 0.02190.02020.01560.01540.01320.01140.0102 | B9Y | 0.9954 | B9Y |
| ***C156R*** | 0.9627 | ***C156R*** |
| C113Y | 0.9232 | C113YC113H |
| DQB38V | 0.8117 | DQB38VDQB38ADQB77RDQB77T |
| ***DRB74L*** | 0.7798 | ***DRB74L*** |
| DPB8L | 0.7664 | DPB8VDPB8LDPB9F |
| DPB35Y | 0.7001 | DPB35Y |
| DPB76V | 0.6999 | DPB76V |
| A76A | 0.5996 | A76A |
| DQA34E | 0.5882 | DQA34EDQA34Q |
| DQB.270 | 0.5556 | DQB.270DQB.210DQB.180DQB.100DQB.90DQB.60DQB.50DQB.40 |

“nexp”= expected number of causal variants assumed in Bayesian variable selection procedure. “size”= number of predictors included. “Best models” are defined as all those with posterior probability ≥0.01; “Best amino acids” are defined as all those with marginal posterior probability of inclusion ≥0.5. Amino acids also appearing in the top five from stepwise regression are shown in ***bold italic***.A period (“.”) in the name of the amino acid indicates a negative position.