

Binding affinities of 438 HLA Class I and II proteins to the complete proteomes of seven (potentially) pandemic viruses and distributions of strongest and weakest HLA peptide binders in human populations worldwide

Supplementary material 5

Extended results for the binding predictions for A/H3N2

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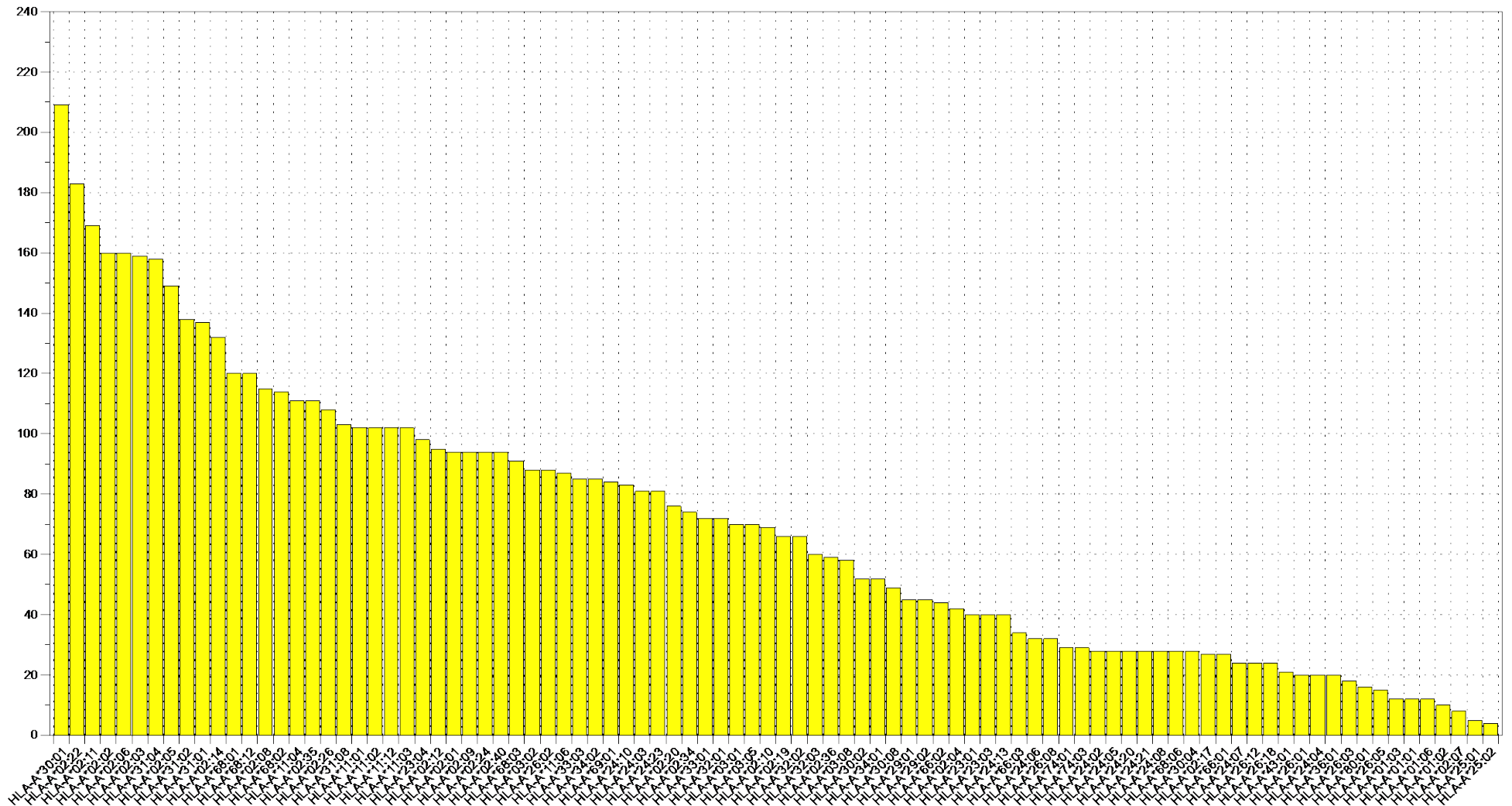
Total number of peptides with strong, regular and weak binding predictions for *HLA-A*

| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 500 nM Regular binders | 500 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|-------------|--|---|--|--|
| HLA-A*01:01 | 3 | 12 | 58 | 4399 |
| HLA-A*01:02 | 1 | 10 | 94 | 4367 |
| HLA-A*01:03 | 2 | 12 | 46 | 4412 |
| HLA-A*01:06 | 2 | 12 | 73 | 4385 |
| HLA-A*02:01 | 39 | 94 | 240 | 4099 |
| HLA-A*02:02 | 59 | 160 | 406 | 3847 |
| HLA-A*02:03 | 62 | 159 | 369 | 3882 |
| HLA-A*02:04 | 10 | 42 | 169 | 4251 |
| HLA-A*02:05 | 27 | 149 | 513 | 3783 |
| HLA-A*02:06 | 56 | 160 | 460 | 3796 |
| HLA-A*02:07 | 1 | 8 | 57 | 4406 |
| HLA-A*02:08 | 16 | 115 | 516 | 3825 |
| HLA-A*02:09 | 39 | 94 | 240 | 4099 |
| HLA-A*02:10 | 11 | 69 | 282 | 4110 |
| HLA-A*02:11 | 120 | 169 | 369 | 3814 |
| HLA-A*02:12 | 47 | 95 | 241 | 4089 |
| HLA-A*02:14 | 33 | 132 | 422 | 3885 |
| HLA-A*02:17 | 4 | 27 | 143 | 4298 |
| HLA-A*02:19 | 23 | 66 | 178 | 4205 |
| HLA-A*02:20 | 23 | 76 | 261 | 4112 |
| HLA-A*02:22 | 80 | 183 | 410 | 3799 |
| HLA-A*02:24 | 39 | 94 | 240 | 4099 |
| HLA-A*02:26 | 29 | 108 | 256 | 4079 |
| HLA-A*02:34 | 26 | 74 | 243 | 4129 |
| HLA-A*02:35 | 40 | 111 | 331 | 3990 |
| HLA-A*02:36 | 23 | 59 | 191 | 4199 |
| HLA-A*02:40 | 39 | 94 | 240 | 4099 |
| HLA-A*03:01 | 17 | 70 | 167 | 4218 |
| HLA-A*03:02 | 15 | 88 | 196 | 4173 |
| HLA-A*03:05 | 17 | 70 | 167 | 4218 |
| HLA-A*03:08 | 4 | 58 | 162 | 4248 |
| HLA-A*11:01 | 32 | 102 | 194 | 4144 |
| HLA-A*11:02 | 32 | 102 | 194 | 4144 |
| HLA-A*11:03 | 28 | 102 | 238 | 4104 |
| HLA-A*11:04 | 23 | 111 | 202 | 4136 |
| HLA-A*11:06 | 15 | 87 | 215 | 4155 |
| HLA-A*11:12 | 32 | 102 | 194 | 4144 |
| HLA-A*23:01 | 14 | 40 | 175 | 4243 |
| HLA-A*23:03 | 14 | 40 | 175 | 4243 |
| HLA-A*23:04 | 32 | 98 | 258 | 4084 |
| HLA-A*24:02 | 7 | 28 | 126 | 4311 |
| HLA-A*24:03 | 29 | 81 | 212 | 4150 |
| HLA-A*24:04 | 0 | 20 | 130 | 4322 |
| HLA-A*24:05 | 7 | 28 | 126 | 4311 |
| HLA-A*24:06 | 5 | 32 | 152 | 4283 |
| HLA-A*24:07 | 3 | 24 | 126 | 4319 |
| HLA-A*24:08 | 2 | 28 | 150 | 4292 |
| HLA-A*24:10 | 24 | 83 | 243 | 4122 |
| HLA-A*24:13 | 14 | 40 | 175 | 4243 |
| HLA-A*24:20 | 7 | 28 | 126 | 4311 |
| HLA-A*24:21 | 7 | 28 | 126 | 4311 |
| HLA-A*24:23 | 29 | 81 | 212 | 4150 |
| HLA-A*25:01 | 0 | 5 | 72 | 4395 |
| HLA-A*25:02 | 0 | 4 | 77 | 4391 |
| HLA-A*26:01 | 1 | 20 | 113 | 4338 |
| HLA-A*26:02 | 26 | 88 | 283 | 4075 |
| HLA-A*26:03 | 0 | 18 | 188 | 4266 |
| HLA-A*26:05 | 1 | 15 | 120 | 4336 |
| HLA-A*26:08 | 1 | 32 | 175 | 4264 |
| HLA-A*26:12 | 1 | 24 | 143 | 4304 |
| HLA-A*26:18 | 1 | 24 | 143 | 4304 |
| HLA-A*29:01 | 20 | 45 | 167 | 4240 |

| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 500 nM Regular binders | 500 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|-------------|---|--|---|---|
| HLA-A*29:02 | 20 | 45 | 167 | 4240 |
| HLA-A*30:01 | 51 | 209 | 722 | 3490 |
| HLA-A*30:02 | 12 | 52 | 217 | 4191 |
| HLA-A*30:04 | 0 | 28 | 365 | 4079 |
| HLA-A*30:08 | 3 | 49 | 315 | 4105 |
| HLA-A*31:01 | 42 | 137 | 265 | 4028 |
| HLA-A*31:02 | 33 | 138 | 304 | 3997 |
| HLA-A*31:04 | 64 | 158 | 330 | 3920 |
| HLA-A*31:08 | 19 | 103 | 379 | 3971 |
| HLA-A*32:01 | 26 | 72 | 290 | 4084 |
| HLA-A*32:02 | 9 | 66 | 237 | 4160 |
| HLA-A*32:03 | 6 | 60 | 218 | 4188 |
| HLA-A*33:01 | 16 | 72 | 173 | 4211 |
| HLA-A*33:03 | 30 | 85 | 216 | 4141 |
| HLA-A*34:01 | 2 | 52 | 389 | 4029 |
| HLA-A*34:02 | 11 | 85 | 277 | 4099 |
| HLA-A*36:01 | 3 | 20 | 132 | 4317 |
| HLA-A*43:01 | 1 | 21 | 148 | 4302 |
| HLA-A*66:01 | 0 | 27 | 226 | 4219 |
| HLA-A*66:02 | 2 | 44 | 351 | 4075 |
| HLA-A*66:03 | 0 | 34 | 278 | 4160 |
| HLA-A*68:01 | 53 | 120 | 299 | 4000 |
| HLA-A*68:02 | 33 | 114 | 350 | 3975 |
| HLA-A*68:03 | 34 | 91 | 245 | 4102 |
| HLA-A*68:06 | 4 | 28 | 325 | 4115 |
| HLA-A*68:12 | 53 | 120 | 299 | 4000 |
| HLA-A*69:01 | 16 | 84 | 312 | 4060 |
| HLA-A*74:01 | 3 | 29 | 143 | 4297 |
| HLA-A*74:03 | 3 | 29 | 143 | 4297 |
| HLA-A*80:01 | 4 | 16 | 61 | 4391 |

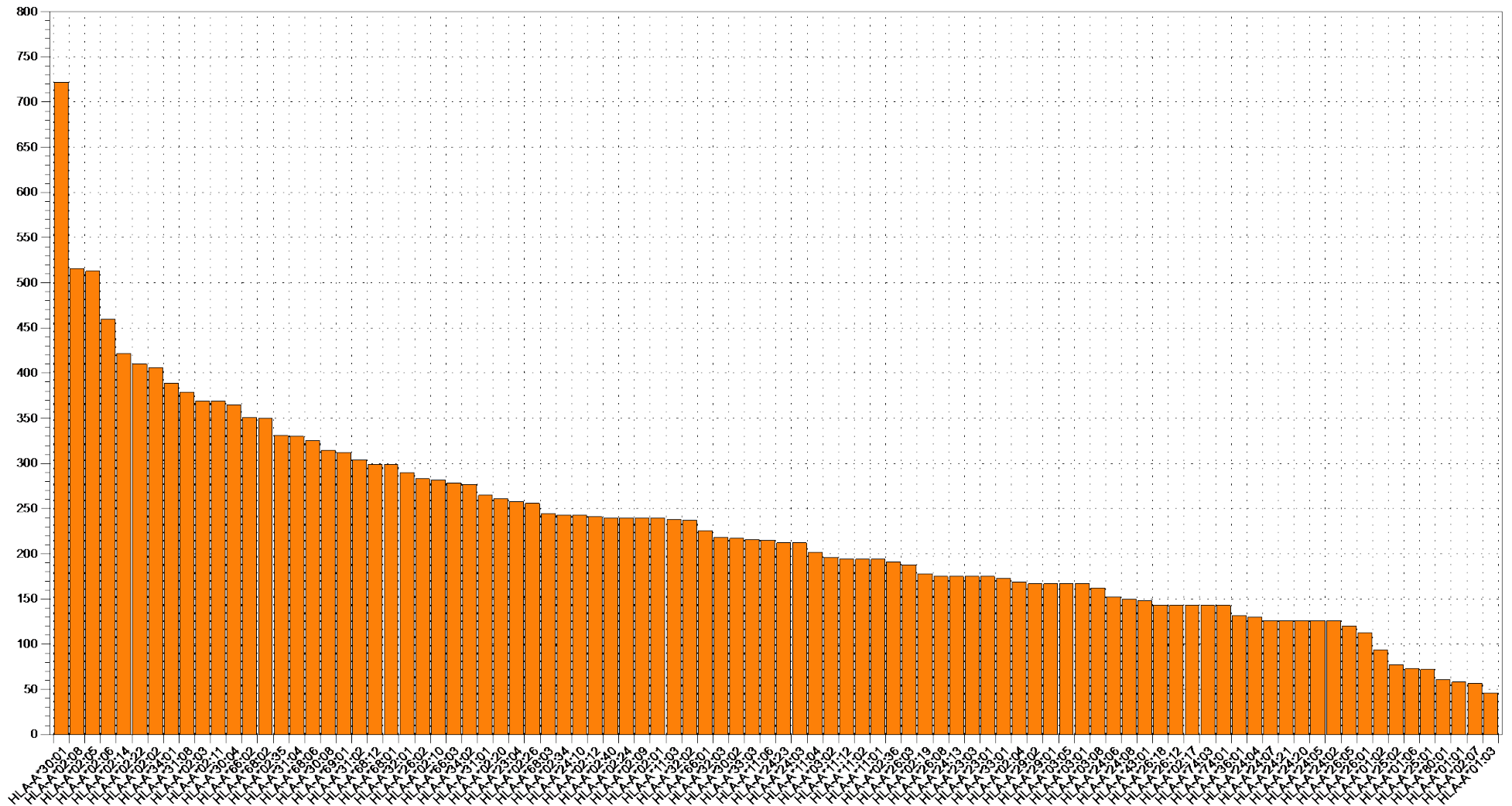
Alleles are ordered alphabetically.

HLA-A alleles ordered by number of presented peptides with regular binding prediction



Alleles are ordered on the x-axis by their regular ($50 \text{ nM} < IC_{50} \leq 500 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-A alleles ordered by number of presented peptides with weak binding prediction



Total number of peptides with strong, regular and weak binding predictions for *HLA-B*

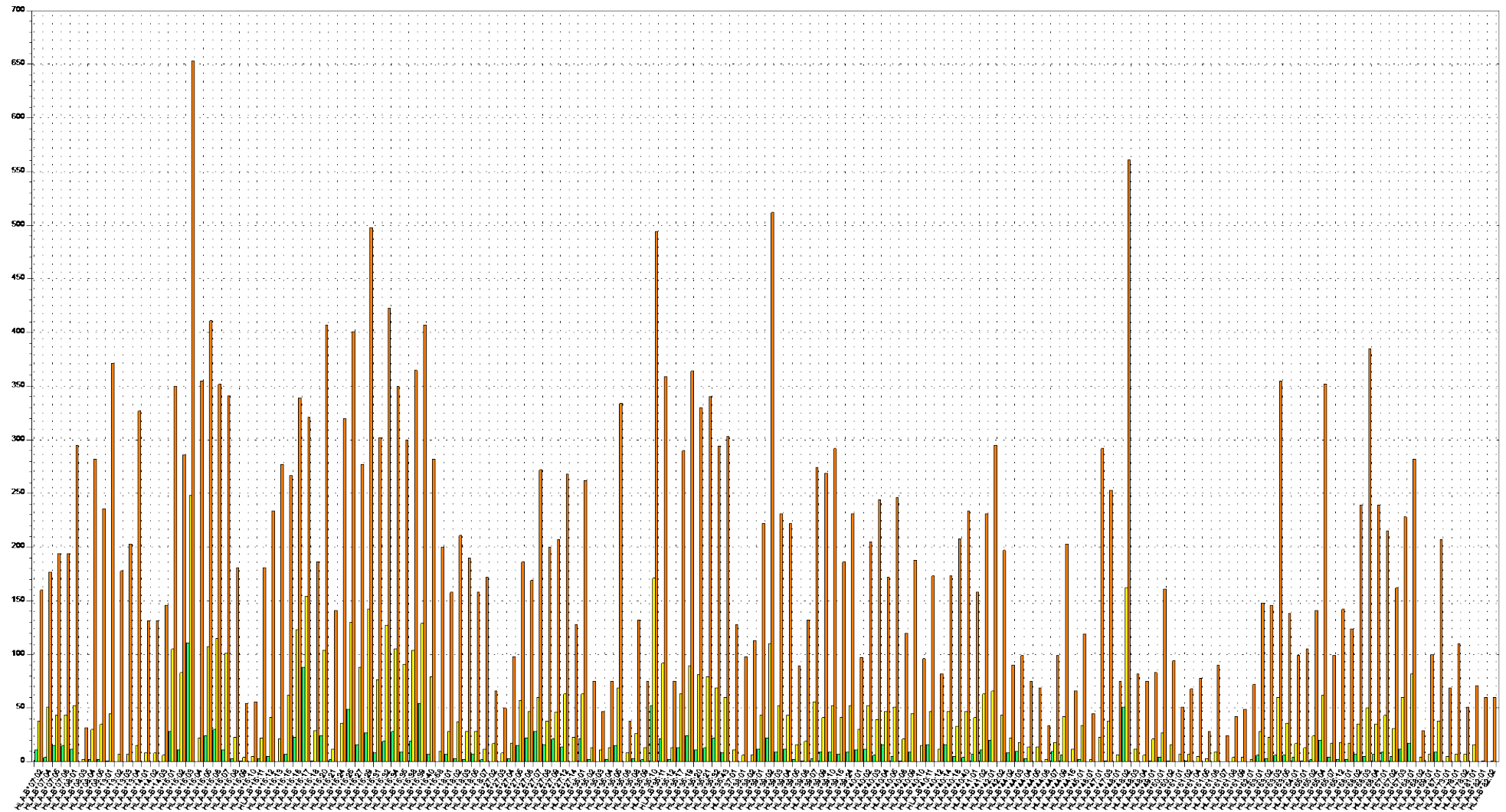
| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 500 nM Regular binders | 500 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|-------------|--|---|--|--|
| HLA-B*07:02 | 11 | 38 | 160 | 4263 |
| HLA-B*07:04 | 4 | 51 | 177 | 4240 |
| HLA-B*07:05 | 15 | 43 | 194 | 4220 |
| HLA-B*07:06 | 15 | 43 | 194 | 4220 |
| HLA-B*08:01 | 12 | 52 | 295 | 4113 |
| HLA-B*08:03 | 0 | 2 | 32 | 4438 |
| HLA-B*08:04 | 2 | 30 | 282 | 4158 |
| HLA-B*08:05 | 2 | 35 | 236 | 4199 |
| HLA-B*13:01 | 1 | 45 | 371 | 4055 |
| HLA-B*13:02 | 0 | 7 | 178 | 4287 |
| HLA-B*13:03 | 0 | 7 | 203 | 4262 |
| HLA-B*13:04 | 0 | 15 | 327 | 4130 |
| HLA-B*14:01 | 0 | 8 | 131 | 4333 |
| HLA-B*14:02 | 0 | 8 | 131 | 4333 |
| HLA-B*14:03 | 0 | 6 | 146 | 4320 |
| HLA-B*15:01 | 28 | 105 | 350 | 3989 |
| HLA-B*15:02 | 11 | 83 | 286 | 4092 |
| HLA-B*15:03 | 111 | 248 | 653 | 3460 |
| HLA-B*15:04 | 0 | 22 | 355 | 4095 |
| HLA-B*15:05 | 24 | 107 | 411 | 3930 |
| HLA-B*15:06 | 30 | 115 | 352 | 3975 |
| HLA-B*15:07 | 11 | 101 | 341 | 4019 |
| HLA-B*15:08 | 3 | 23 | 181 | 4265 |
| HLA-B*15:09 | 1 | 4 | 54 | 4413 |
| HLA-B*15:10 | 0 | 5 | 56 | 4411 |
| HLA-B*15:11 | 3 | 22 | 181 | 4266 |
| HLA-B*15:12 | 5 | 41 | 234 | 4192 |
| HLA-B*15:13 | 0 | 21 | 277 | 4174 |
| HLA-B*15:15 | 7 | 62 | 267 | 4136 |
| HLA-B*15:16 | 23 | 123 | 339 | 3987 |
| HLA-B*15:17 | 88 | 154 | 321 | 3909 |
| HLA-B*15:18 | 1 | 29 | 186 | 4256 |
| HLA-B*15:20 | 24 | 104 | 407 | 3937 |
| HLA-B*15:21 | 2 | 12 | 141 | 4317 |
| HLA-B*15:24 | 0 | 36 | 320 | 4116 |
| HLA-B*15:25 | 49 | 130 | 401 | 3892 |
| HLA-B*15:27 | 16 | 88 | 277 | 4091 |
| HLA-B*15:29 | 27 | 142 | 498 | 3805 |
| HLA-B*15:31 | 8 | 76 | 302 | 4086 |
| HLA-B*15:32 | 19 | 127 | 423 | 3903 |
| HLA-B*15:34 | 28 | 105 | 350 | 3989 |
| HLA-B*15:35 | 9 | 91 | 300 | 4072 |
| HLA-B*15:38 | 19 | 104 | 365 | 3984 |
| HLA-B*15:39 | 54 | 129 | 407 | 3882 |
| HLA-B*15:40 | 7 | 79 | 282 | 4104 |
| HLA-B*15:58 | 0 | 10 | 200 | 4262 |
| HLA-B*18:01 | 7 | 28 | 158 | 4279 |
| HLA-B*18:02 | 3 | 37 | 211 | 4221 |
| HLA-B*18:03 | 2 | 28 | 190 | 4252 |
| HLA-B*18:05 | 7 | 28 | 158 | 4279 |
| HLA-B*18:07 | 2 | 12 | 172 | 4286 |
| HLA-B*27:02 | 0 | 17 | 66 | 4389 |
| HLA-B*27:03 | 0 | 8 | 50 | 4414 |
| HLA-B*27:04 | 3 | 17 | 98 | 4354 |
| HLA-B*27:05 | 15 | 57 | 186 | 4214 |
| HLA-B*27:06 | 22 | 47 | 169 | 4234 |
| HLA-B*27:07 | 28 | 60 | 272 | 4112 |
| HLA-B*27:08 | 16 | 38 | 200 | 4218 |
| HLA-B*27:09 | 21 | 46 | 207 | 4198 |
| HLA-B*27:12 | 14 | 63 | 268 | 4127 |
| HLA-B*27:14 | 0 | 23 | 128 | 4321 |
| HLA-B*35:01 | 21 | 63 | 262 | 4126 |

| | IC ₅₀ ≤ 50 nM Strong binders | 50 nM < IC ₅₀ ≤ 500 nM Regular binders | 500 nM < IC ₅₀ ≤ 5000 nM Weak binders | IC ₅₀ > 5000 nM Non binders |
|-------------|--|--|---|---|
| HLA-B*35:02 | 2 | 13 | 75 | 4382 |
| HLA-B*35:03 | 0 | 11 | 47 | 4414 |
| HLA-B*35:04 | 2 | 13 | 75 | 4382 |
| HLA-B*35:05 | 15 | 69 | 334 | 4054 |
| HLA-B*35:06 | 0 | 8 | 38 | 4426 |
| HLA-B*35:08 | 3 | 26 | 132 | 4311 |
| HLA-B*35:09 | 2 | 13 | 75 | 4382 |
| HLA-B*35:10 | 52 | 171 | 494 | 3755 |
| HLA-B*35:11 | 21 | 92 | 359 | 4000 |
| HLA-B*35:12 | 2 | 13 | 75 | 4382 |
| HLA-B*35:17 | 13 | 63 | 290 | 4106 |
| HLA-B*35:19 | 24 | 89 | 364 | 3995 |
| HLA-B*35:20 | 11 | 81 | 330 | 4050 |
| HLA-B*35:21 | 13 | 79 | 340 | 4040 |
| HLA-B*35:32 | 22 | 69 | 294 | 4087 |
| HLA-B*35:43 | 8 | 60 | 303 | 4101 |
| HLA-B*37:01 | 0 | 11 | 128 | 4333 |
| HLA-B*38:01 | 0 | 6 | 98 | 4368 |
| HLA-B*38:02 | 0 | 6 | 113 | 4353 |
| HLA-B*39:01 | 12 | 43 | 222 | 4195 |
| HLA-B*39:02 | 22 | 110 | 512 | 3828 |
| HLA-B*39:03 | 9 | 52 | 231 | 4180 |
| HLA-B*39:04 | 12 | 43 | 222 | 4195 |
| HLA-B*39:05 | 2 | 16 | 89 | 4365 |
| HLA-B*39:06 | 1 | 19 | 132 | 4320 |
| HLA-B*39:07 | 3 | 56 | 274 | 4139 |
| HLA-B*39:09 | 9 | 41 | 269 | 4153 |
| HLA-B*39:10 | 9 | 52 | 292 | 4119 |
| HLA-B*39:15 | 7 | 41 | 186 | 4238 |
| HLA-B*39:24 | 9 | 52 | 231 | 4180 |
| HLA-B*40:01 | 11 | 30 | 97 | 4334 |
| HLA-B*40:02 | 12 | 52 | 205 | 4203 |
| HLA-B*40:03 | 6 | 39 | 244 | 4183 |
| HLA-B*40:04 | 16 | 47 | 172 | 4237 |
| HLA-B*40:05 | 5 | 51 | 246 | 4170 |
| HLA-B*40:06 | 1 | 21 | 120 | 4330 |
| HLA-B*40:09 | 9 | 45 | 188 | 4230 |
| HLA-B*40:10 | 0 | 15 | 96 | 4361 |
| HLA-B*40:11 | 16 | 47 | 173 | 4236 |
| HLA-B*40:12 | 0 | 12 | 82 | 4378 |
| HLA-B*40:14 | 16 | 47 | 173 | 4236 |
| HLA-B*40:16 | 5 | 33 | 208 | 4226 |
| HLA-B*40:40 | 4 | 47 | 234 | 4187 |
| HLA-B*41:01 | 7 | 41 | 158 | 4266 |
| HLA-B*41:02 | 11 | 63 | 231 | 4167 |
| HLA-B*42:01 | 20 | 66 | 295 | 4091 |
| HLA-B*42:02 | 0 | 43 | 197 | 4232 |
| HLA-B*44:02 | 8 | 22 | 90 | 4352 |
| HLA-B*44:03 | 10 | 18 | 99 | 4345 |
| HLA-B*44:04 | 3 | 14 | 75 | 4380 |
| HLA-B*44:05 | 0 | 14 | 69 | 4389 |
| HLA-B*44:06 | 0 | 2 | 34 | 4436 |
| HLA-B*44:07 | 10 | 18 | 99 | 4345 |
| HLA-B*44:09 | 6 | 42 | 203 | 4221 |
| HLA-B*44:15 | 0 | 12 | 66 | 4394 |
| HLA-B*45:01 | 2 | 34 | 119 | 4317 |
| HLA-B*46:01 | 0 | 2 | 45 | 4425 |
| HLA-B*47:01 | 0 | 23 | 292 | 4157 |
| HLA-B*47:03 | 1 | 38 | 253 | 4180 |
| HLA-B*48:01 | 0 | 6 | 75 | 4391 |
| HLA-B*48:02 | 51 | 162 | 561 | 3698 |
| HLA-B*48:03 | 0 | 12 | 82 | 4378 |
| HLA-B*48:04 | 0 | 6 | 75 | 4391 |
| HLA-B*49:01 | 1 | 21 | 83 | 4367 |
| HLA-B*50:01 | 4 | 27 | 161 | 4280 |

| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 500 nM Regular binders | 500 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|-------------|---|--|---|---|
| HLA-B*50:02 | 1 | 16 | 94 | 4361 |
| HLA-B*51:01 | 0 | 7 | 51 | 4414 |
| HLA-B*51:02 | 1 | 7 | 68 | 4396 |
| HLA-B*51:04 | 0 | 5 | 78 | 4389 |
| HLA-B*51:05 | 0 | 3 | 28 | 4441 |
| HLA-B*51:06 | 0 | 9 | 90 | 4373 |
| HLA-B*51:07 | 0 | 0 | 24 | 4448 |
| HLA-B*51:08 | 0 | 4 | 42 | 4426 |
| HLA-B*51:09 | 0 | 4 | 49 | 4419 |
| HLA-B*52:01 | 0 | 2 | 72 | 4398 |
| HLA-B*53:01 | 6 | 28 | 148 | 4290 |
| HLA-B*53:02 | 3 | 23 | 146 | 4300 |
| HLA-B*53:03 | 6 | 60 | 355 | 4051 |
| HLA-B*53:05 | 6 | 36 | 138 | 4292 |
| HLA-B*54:01 | 4 | 17 | 99 | 4352 |
| HLA-B*55:01 | 1 | 13 | 105 | 4353 |
| HLA-B*55:02 | 2 | 24 | 141 | 4305 |
| HLA-B*55:04 | 20 | 62 | 352 | 4038 |
| HLA-B*55:07 | 4 | 17 | 99 | 4352 |
| HLA-B*55:12 | 2 | 18 | 142 | 4310 |
| HLA-B*56:01 | 2 | 17 | 124 | 4329 |
| HLA-B*56:02 | 7 | 35 | 239 | 4191 |
| HLA-B*56:03 | 5 | 50 | 385 | 4032 |
| HLA-B*56:04 | 7 | 35 | 239 | 4191 |
| HLA-B*57:01 | 9 | 43 | 215 | 4205 |
| HLA-B*57:02 | 5 | 31 | 162 | 4274 |
| HLA-B*57:03 | 12 | 60 | 228 | 4172 |
| HLA-B*58:01 | 17 | 82 | 282 | 4091 |
| HLA-B*58:02 | 0 | 4 | 29 | 4439 |
| HLA-B*59:01 | 0 | 7 | 100 | 4365 |
| HLA-B*67:01 | 9 | 38 | 207 | 4218 |
| HLA-B*73:01 | 0 | 5 | 69 | 4398 |
| HLA-B*78:01 | 0 | 7 | 110 | 4355 |
| HLA-B*78:02 | 0 | 7 | 51 | 4414 |
| HLA-B*81:01 | 0 | 16 | 71 | 4385 |
| HLA-B*82:01 | 0 | 1 | 60 | 4411 |
| HLA-B*82:02 | 0 | 1 | 60 | 4411 |

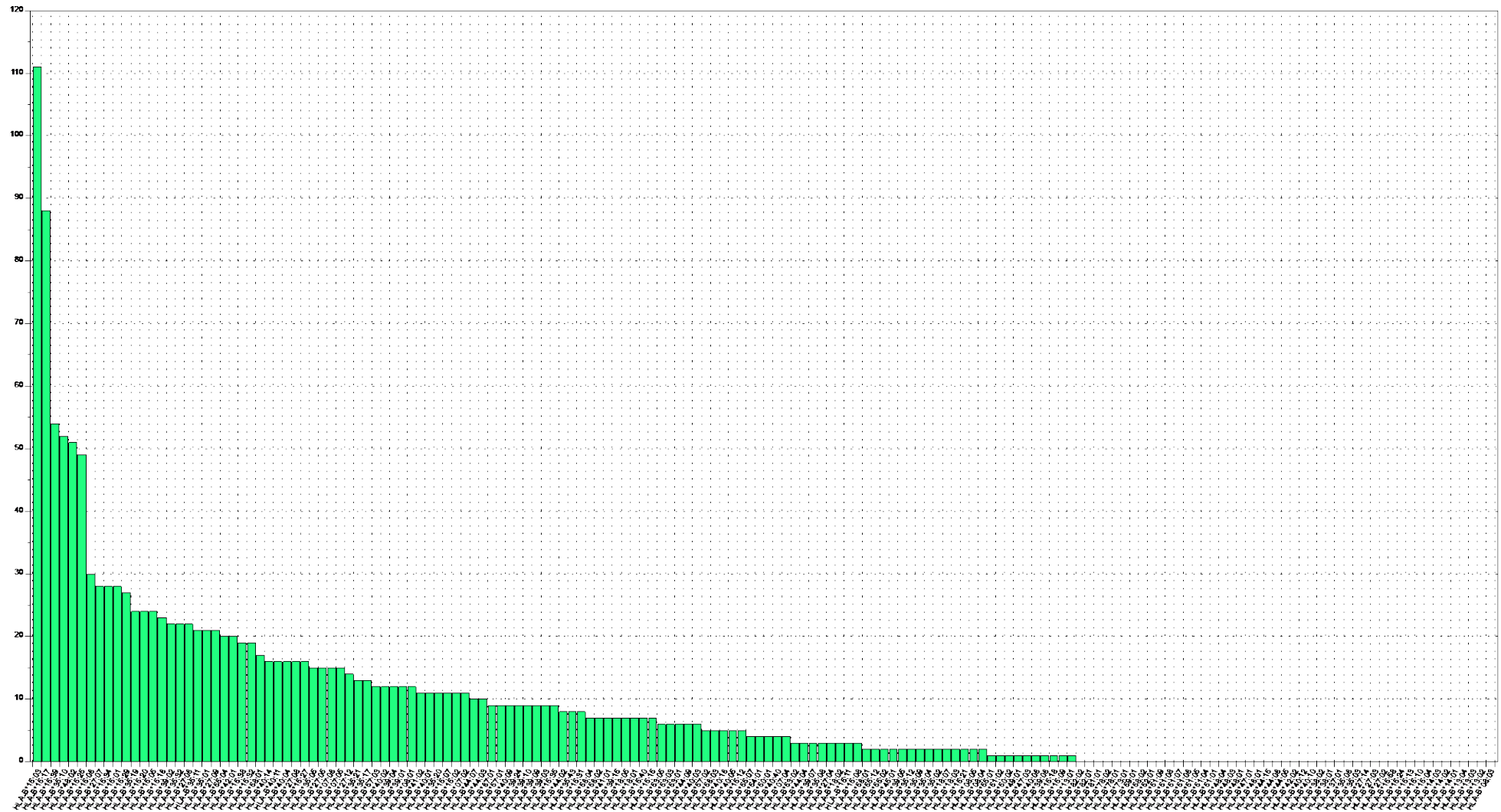
Alleles are ordered alphabetically.

General binding prediction tendencies for *HLA-B*

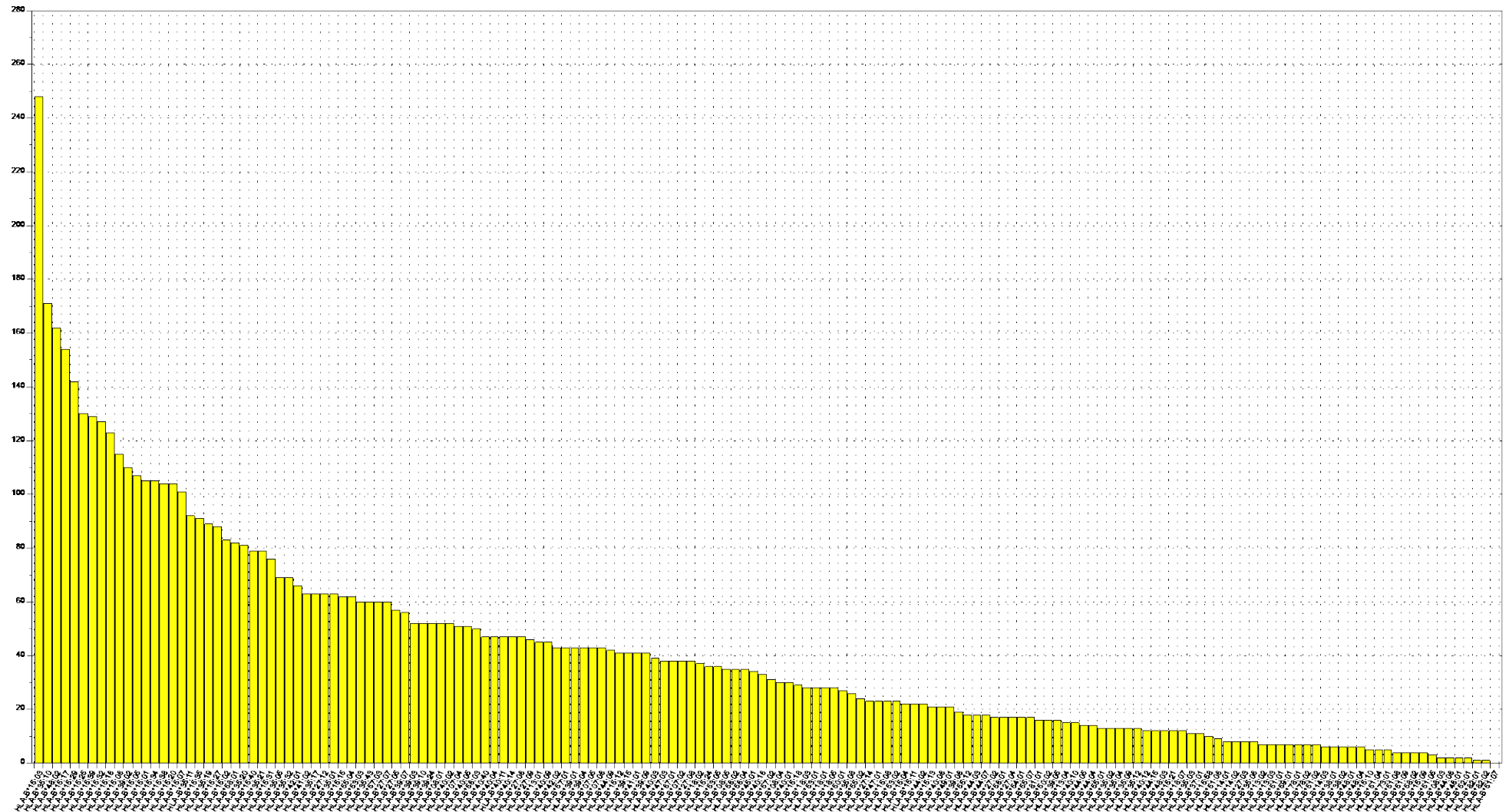


Alleles are ordered alphabetically on the x-axis, while the number of peptides binding with strong ($IC_{50} \leq 50$ nM), regular (50 nM $< IC_{50} \leq 500$ nM) and weak (500 nM $< IC_{50} \leq 5000$ nM) binding prediction are displayed on the y-axis.

HLA-B alleles ordered by number of presented peptides with strong binding prediction

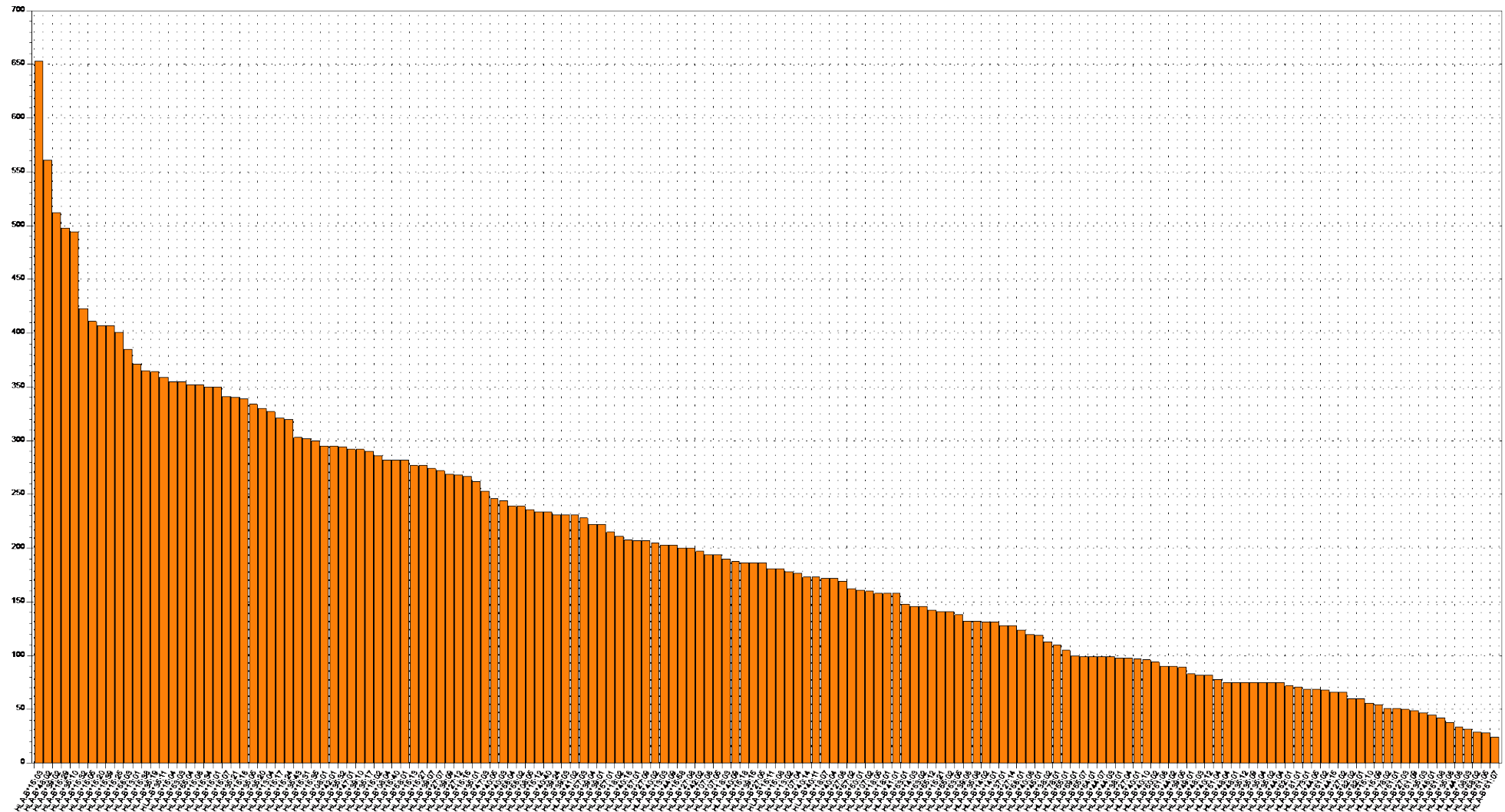


HLA-B alleles ordered by number of presented peptides with regular binding prediction



Alleles are ordered on the x-axis by their regular ($50 \text{ nM} < IC_{50} \leq 500 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-B alleles ordered by number of presented peptides with weak binding prediction



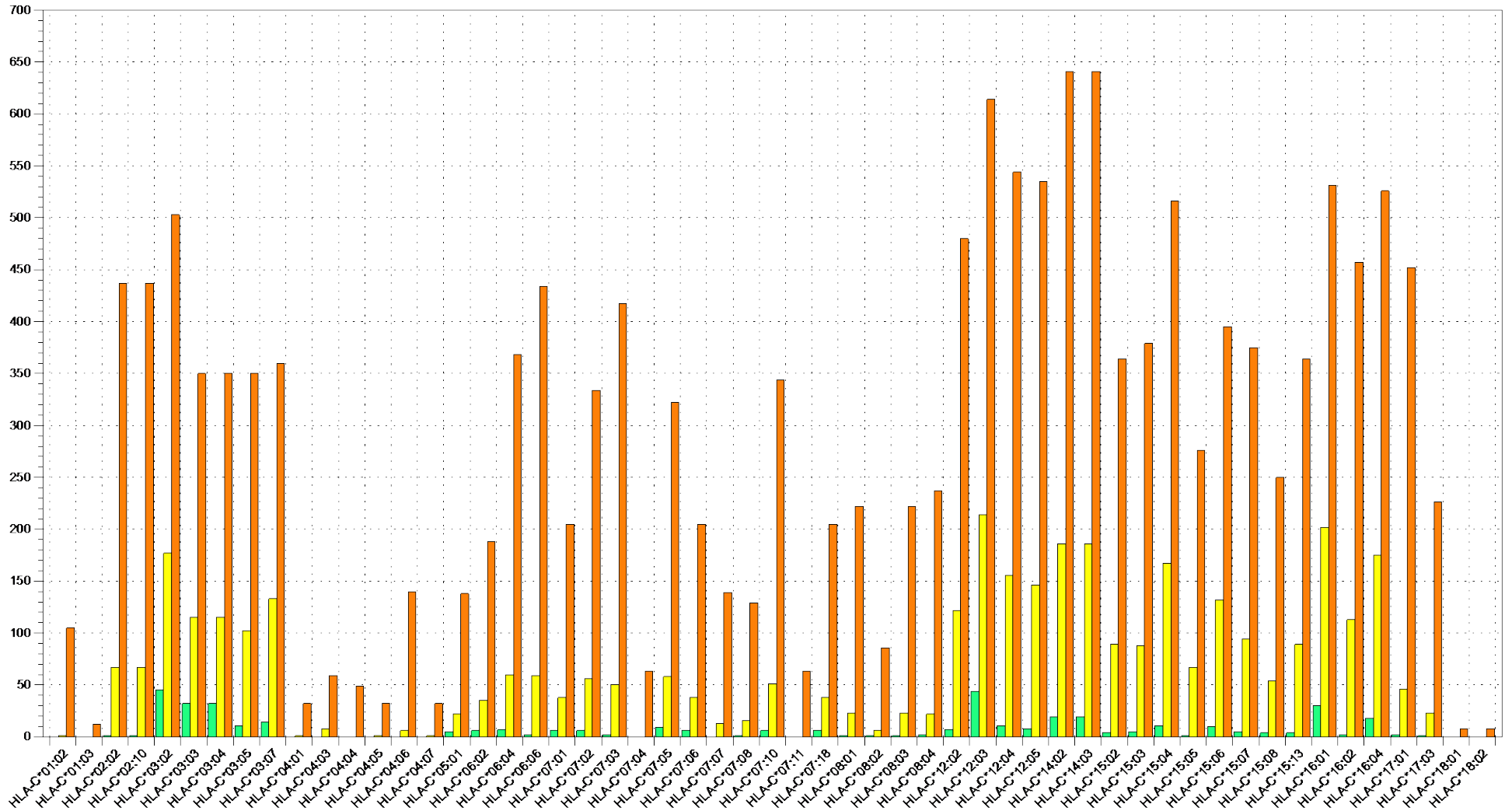
Alleles are ordered on the x-axis by their weak ($500 \text{ nM} < IC_{50} \leq 5000 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.

Total number of peptides with strong, regular and weak binding predictions for *HLA-C*

| | $IC_{50} \leq 50$ nM Strong binders | 50 nM < $IC_{50} \leq 500$ nM Regular binders | 500 nM < $IC_{50} \leq 5000$ nM Weak binders | $IC_{50} > 5000$ nM Non binders |
|-------------|--|--|---|------------------------------------|
| HLA-C*01:02 | 0 | 1 | 105 | 4366 |
| HLA-C*01:03 | 0 | 0 | 12 | 4460 |
| HLA-C*02:02 | 1 | 67 | 437 | 3967 |
| HLA-C*02:10 | 1 | 67 | 437 | 3967 |
| HLA-C*03:02 | 45 | 177 | 503 | 3747 |
| HLA-C*03:03 | 32 | 115 | 350 | 3975 |
| HLA-C*03:04 | 32 | 115 | 350 | 3975 |
| HLA-C*03:05 | 11 | 102 | 350 | 4009 |
| HLA-C*03:07 | 14 | 133 | 360 | 3965 |
| HLA-C*04:01 | 0 | 1 | 32 | 4439 |
| HLA-C*04:03 | 0 | 8 | 59 | 4405 |
| HLA-C*04:04 | 0 | 0 | 49 | 4423 |
| HLA-C*04:05 | 0 | 1 | 32 | 4439 |
| HLA-C*04:06 | 0 | 6 | 140 | 4326 |
| HLA-C*04:07 | 0 | 1 | 32 | 4439 |
| HLA-C*05:01 | 5 | 22 | 138 | 4307 |
| HLA-C*06:02 | 6 | 35 | 188 | 4243 |
| HLA-C*06:04 | 7 | 60 | 368 | 4037 |
| HLA-C*06:06 | 2 | 59 | 434 | 3977 |
| HLA-C*07:01 | 6 | 38 | 205 | 4223 |
| HLA-C*07:02 | 6 | 56 | 334 | 4076 |
| HLA-C*07:03 | 2 | 50 | 417 | 4003 |
| HLA-C*07:04 | 0 | 0 | 63 | 4409 |
| HLA-C*07:05 | 9 | 58 | 322 | 4083 |
| HLA-C*07:06 | 6 | 38 | 205 | 4223 |
| HLA-C*07:07 | 0 | 13 | 139 | 4320 |
| HLA-C*07:08 | 1 | 16 | 129 | 4326 |
| HLA-C*07:10 | 6 | 51 | 344 | 4071 |
| HLA-C*07:11 | 0 | 0 | 63 | 4409 |
| HLA-C*07:18 | 6 | 38 | 205 | 4223 |
| HLA-C*08:01 | 1 | 23 | 222 | 4226 |
| HLA-C*08:02 | 1 | 6 | 86 | 4379 |
| HLA-C*08:03 | 1 | 23 | 222 | 4226 |
| HLA-C*08:04 | 2 | 22 | 237 | 4211 |
| HLA-C*12:02 | 7 | 122 | 480 | 3863 |
| HLA-C*12:03 | 44 | 214 | 614 | 3600 |
| HLA-C*12:04 | 11 | 156 | 544 | 3761 |
| HLA-C*12:05 | 8 | 146 | 535 | 3783 |
| HLA-C*14:02 | 19 | 186 | 641 | 3626 |
| HLA-C*14:03 | 19 | 186 | 641 | 3626 |
| HLA-C*15:02 | 4 | 89 | 364 | 4015 |
| HLA-C*15:03 | 5 | 88 | 379 | 4000 |
| HLA-C*15:04 | 11 | 167 | 516 | 3778 |
| HLA-C*15:05 | 1 | 67 | 276 | 4128 |
| HLA-C*15:06 | 10 | 132 | 395 | 3935 |
| HLA-C*15:07 | 5 | 94 | 375 | 3998 |
| HLA-C*15:08 | 4 | 54 | 250 | 4164 |
| HLA-C*15:13 | 4 | 89 | 364 | 4015 |
| HLA-C*16:01 | 30 | 202 | 531 | 3709 |
| HLA-C*16:02 | 2 | 113 | 457 | 3900 |
| HLA-C*16:04 | 18 | 175 | 526 | 3753 |
| HLA-C*17:01 | 2 | 46 | 452 | 3972 |
| HLA-C*17:03 | 1 | 23 | 226 | 4222 |
| HLA-C*18:01 | 0 | 0 | 8 | 4464 |
| HLA-C*18:02 | 0 | 0 | 8 | 4464 |

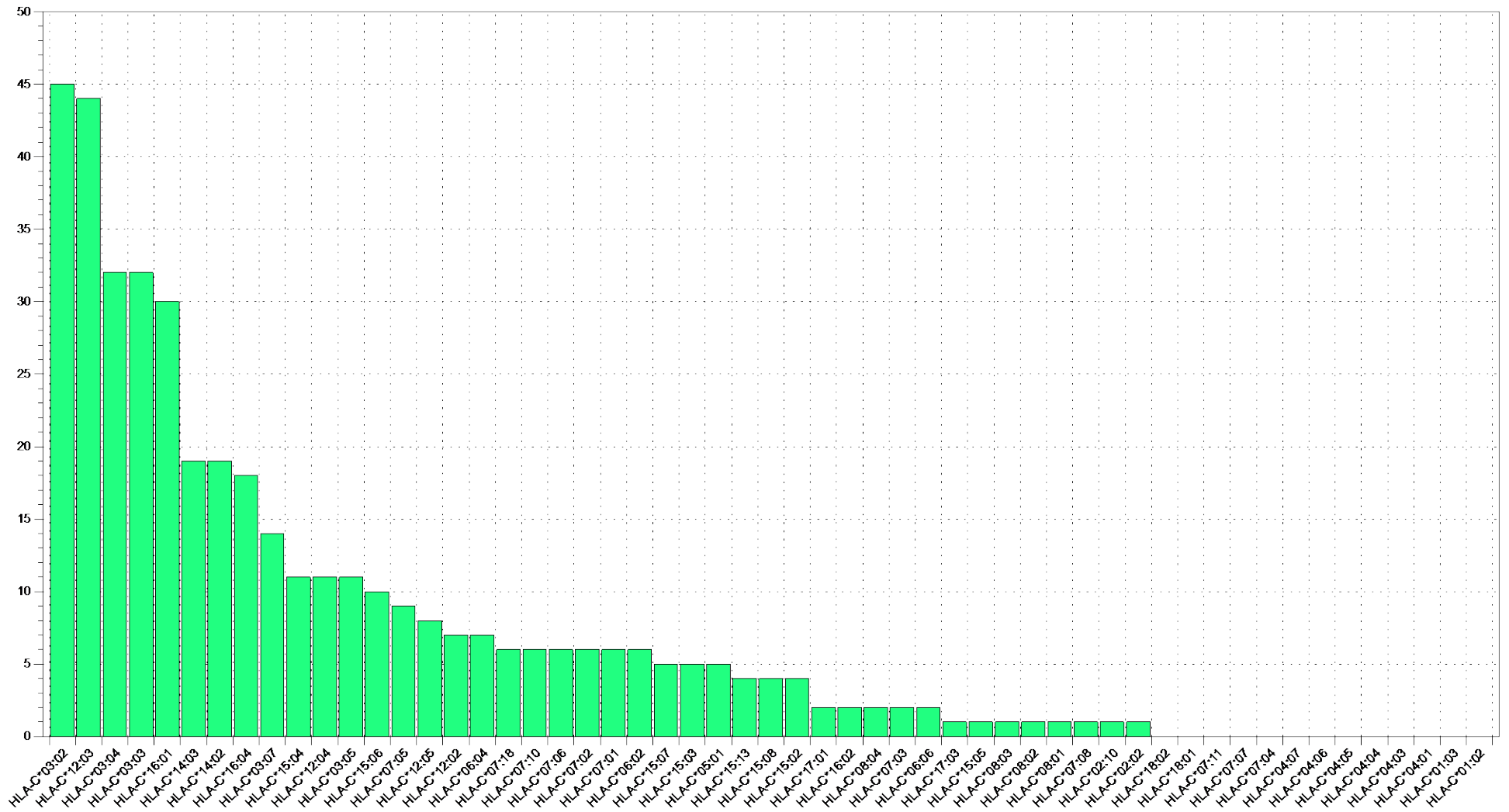
Alleles are ordered alphabetically.

General binding prediction tendencies for HLA-C



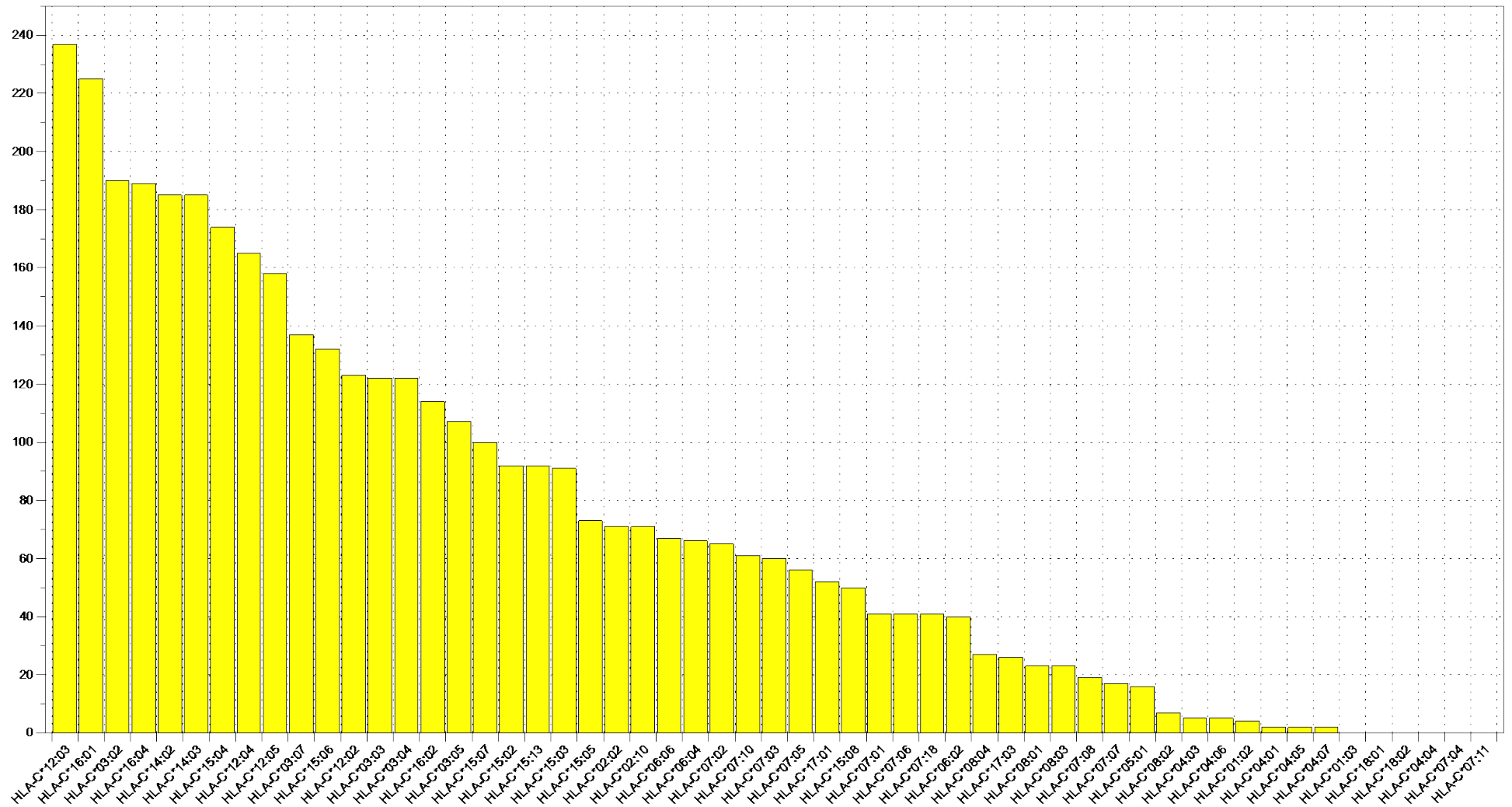
Alleles are ordered alphabetically on the x-axis, while the number of peptides binding with strong ($IC_{50} \leq 50$ nM), regular ($50 \text{ nM} < IC_{50} \leq 500$ nM) and weak ($500 \text{ nM} < IC_{50} \leq 5000$ nM) binding prediction are displayed on the y-axis.

HLA-C alleles ordered by number of presented peptides with strong binding prediction



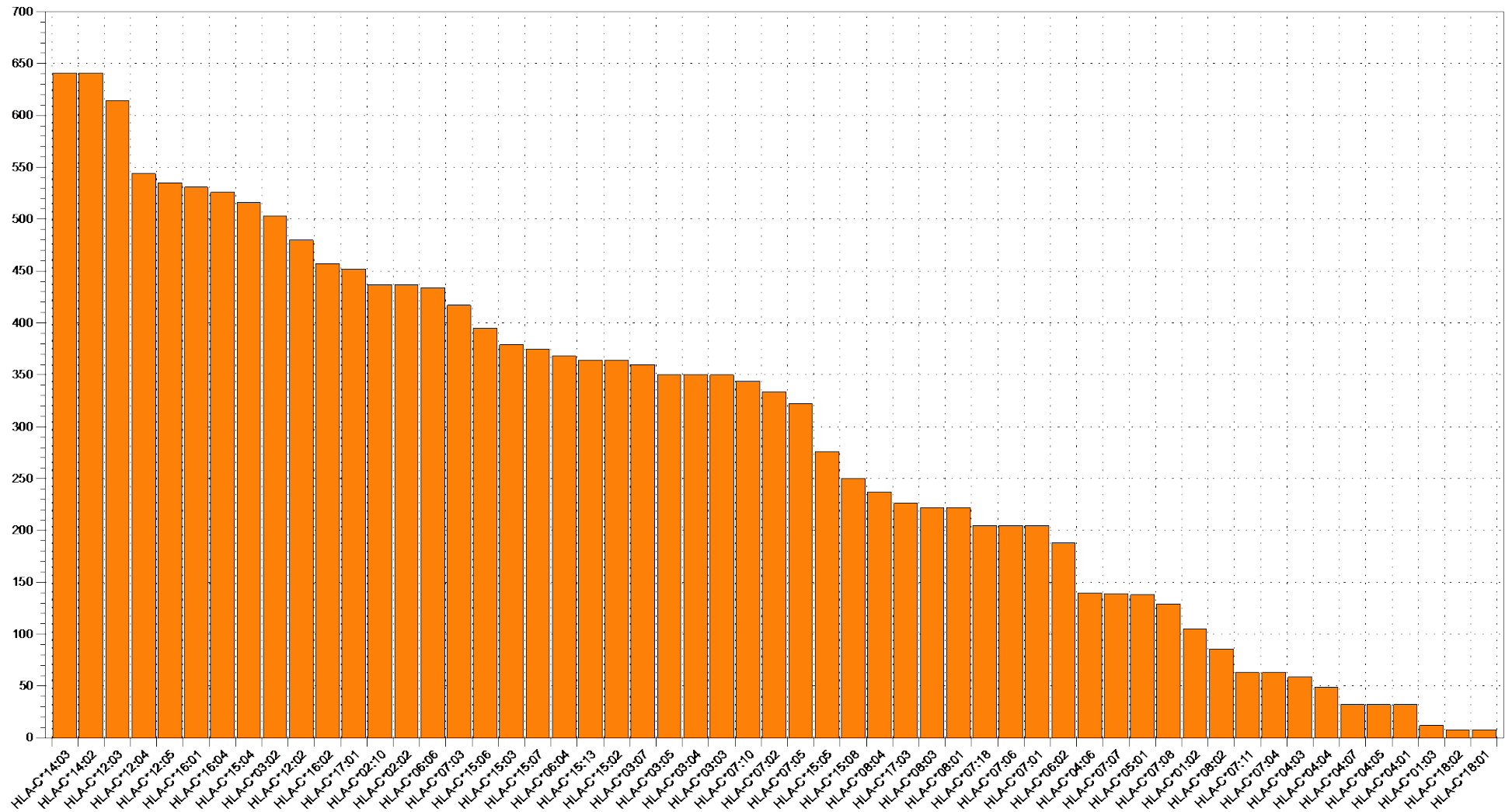
Alleles are ordered on the x-axis by their strong ($IC_{50} \leq 50$ nM) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-C alleles ordered by number of presented peptides with regular binding prediction



Alleles are ordered on the x-axis by their regular ($50 \text{ nM} < \text{IC}_{50} \leq 500 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-C alleles ordered by number of presented peptides with weak binding prediction



Alleles are ordered on the x-axis by their weak (500 nM < IC₅₀ ≤ 5000 nM) binding prediction and the number of peptides presented are displayed on the y-axis.

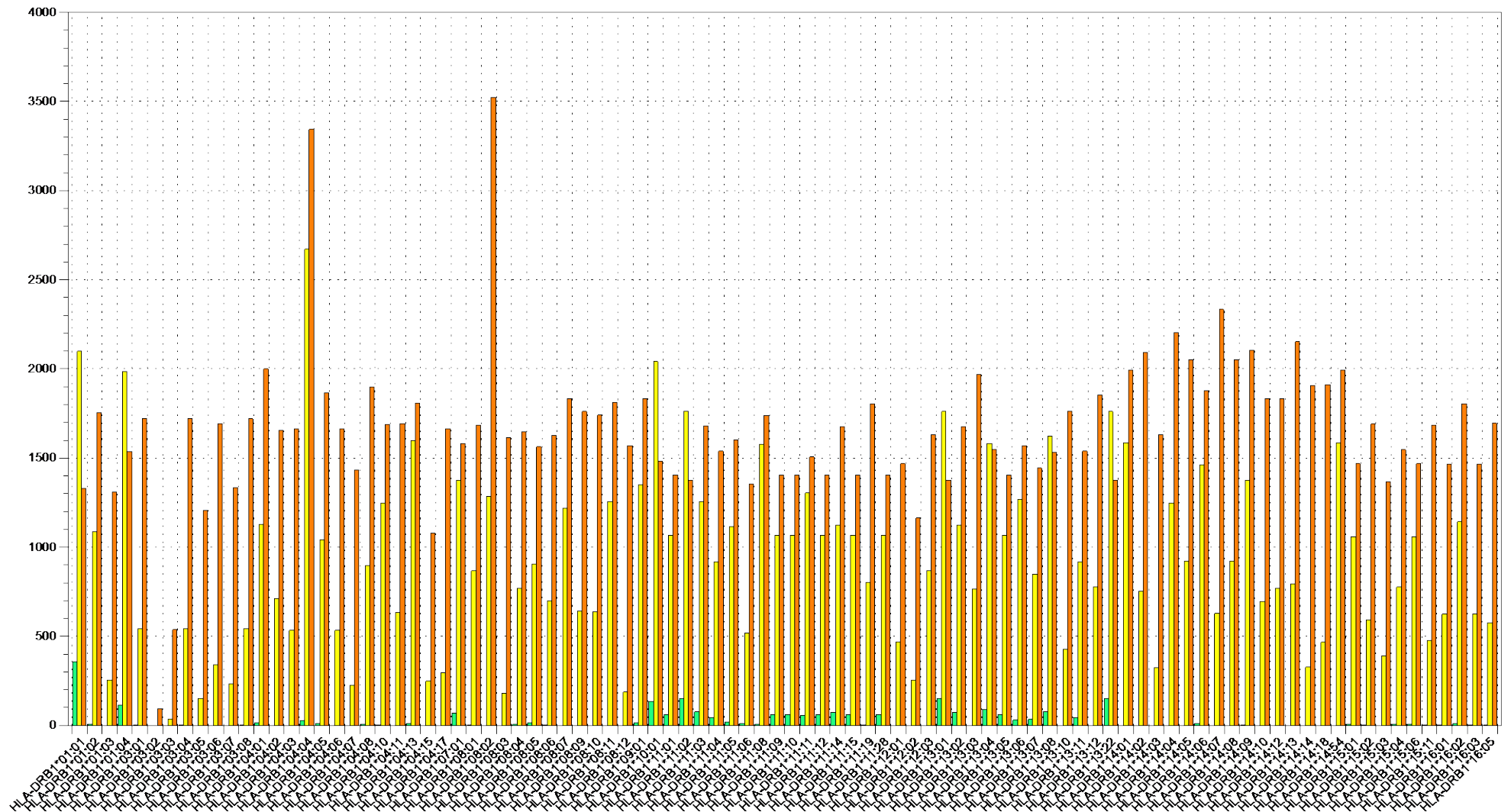
Total number of peptides with strong, regular and weak binding predictions for *HLA-DRB1*

| | IC ₅₀ ≤ 50 nM Strong binders | 50 nM < IC ₅₀ ≤ 1000 nM Regular binders | 1000 nM < IC ₅₀ ≤ 5000 nM Weak binders | IC ₅₀ > 5000 nM Non binders |
|----------------|--|---|--|---|
| HLA-DRB1*01:01 | 357 | 2099 | 1330 | 645 |
| HLA-DRB1*01:02 | 7 | 1088 | 1754 | 1582 |
| HLA-DRB1*01:03 | 0 | 256 | 1311 | 2864 |
| HLA-DRB1*01:04 | 115 | 1985 | 1537 | 794 |
| HLA-DRB1*03:01 | 1 | 545 | 1720 | 2165 |
| HLA-DRB1*03:02 | 0 | 0 | 94 | 4337 |
| HLA-DRB1*03:03 | 0 | 35 | 538 | 3858 |
| HLA-DRB1*03:04 | 1 | 545 | 1720 | 2165 |
| HLA-DRB1*03:05 | 0 | 152 | 1206 | 3073 |
| HLA-DRB1*03:06 | 0 | 341 | 1693 | 2397 |
| HLA-DRB1*03:07 | 0 | 235 | 1334 | 2862 |
| HLA-DRB1*03:08 | 1 | 545 | 1720 | 2165 |
| HLA-DRB1*04:01 | 14 | 1130 | 2000 | 1287 |
| HLA-DRB1*04:02 | 0 | 711 | 1656 | 2064 |
| HLA-DRB1*04:03 | 0 | 533 | 1664 | 2234 |
| HLA-DRB1*04:04 | 15 | 1336 | 1672 | 1408 |
| HLA-DRB1*04:05 | 10 | 1040 | 1864 | 1517 |
| HLA-DRB1*04:06 | 0 | 533 | 1664 | 2234 |
| HLA-DRB1*04:07 | 0 | 227 | 1434 | 2770 |
| HLA-DRB1*04:08 | 9 | 899 | 1897 | 1626 |
| HLA-DRB1*04:10 | 4 | 1248 | 1690 | 1489 |
| HLA-DRB1*04:11 | 0 | 633 | 1693 | 2105 |
| HLA-DRB1*04:13 | 13 | 1597 | 1808 | 1013 |
| HLA-DRB1*04:15 | 0 | 249 | 1078 | 3104 |
| HLA-DRB1*04:17 | 0 | 296 | 1665 | 2470 |
| HLA-DRB1*07:01 | 71 | 1376 | 1583 | 1401 |
| HLA-DRB1*08:01 | 1 | 868 | 1686 | 1876 |
| HLA-DRB1*08:02 | 0 | 643 | 1762 | 2026 |
| HLA-DRB1*08:03 | 0 | 179 | 1614 | 2638 |
| HLA-DRB1*08:04 | 6 | 769 | 1647 | 2009 |
| HLA-DRB1*08:05 | 14 | 905 | 1563 | 1949 |
| HLA-DRB1*08:06 | 3 | 701 | 1626 | 2101 |
| HLA-DRB1*08:07 | 0 | 1217 | 1833 | 1381 |
| HLA-DRB1*08:09 | 0 | 643 | 1762 | 2026 |
| HLA-DRB1*08:10 | 0 | 639 | 1740 | 2052 |
| HLA-DRB1*08:11 | 0 | 1257 | 1812 | 1362 |
| HLA-DRB1*08:12 | 0 | 187 | 1569 | 2675 |
| HLA-DRB1*09:01 | 14 | 1351 | 1832 | 1234 |
| HLA-DRB1*10:01 | 136 | 2042 | 1482 | 771 |
| HLA-DRB1*11:01 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*11:02 | 153 | 1761 | 1375 | 1142 |
| HLA-DRB1*11:03 | 77 | 1255 | 1679 | 1420 |
| HLA-DRB1*11:04 | 45 | 919 | 1539 | 1928 |
| HLA-DRB1*11:05 | 21 | 1117 | 1602 | 1691 |
| HLA-DRB1*11:06 | 11 | 518 | 1356 | 2546 |
| HLA-DRB1*11:08 | 9 | 1579 | 1738 | 1105 |
| HLA-DRB1*11:09 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*11:10 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*11:11 | 58 | 1304 | 1506 | 1563 |
| HLA-DRB1*11:12 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*11:14 | 75 | 1123 | 1677 | 1556 |
| HLA-DRB1*11:15 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*11:19 | 2 | 804 | 1803 | 1822 |
| HLA-DRB1*11:28 | 63 | 1068 | 1404 | 1896 |
| HLA-DRB1*12:01 | 0 | 470 | 1469 | 2492 |
| HLA-DRB1*12:02 | 0 | 255 | 1163 | 3013 |
| HLA-DRB1*12:03 | 0 | 868 | 1630 | 1933 |
| HLA-DRB1*13:01 | 153 | 1761 | 1375 | 1142 |
| HLA-DRB1*13:02 | 75 | 1123 | 1677 | 1556 |
| HLA-DRB1*13:03 | 0 | 767 | 1969 | 1695 |
| HLA-DRB1*13:04 | 91 | 1581 | 1549 | 1210 |
| HLA-DRB1*13:05 | 63 | 1068 | 1404 | 1896 |

| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 1000 nM Regular binders | 1000 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|----------------|---|---|--|---|
| HLA-DRB1*13:06 | 31 | 1268 | 1567 | 1565 |
| HLA-DRB1*13:07 | 35 | 848 | 1444 | 2104 |
| HLA-DRB1*13:08 | 79 | 1624 | 1533 | 1195 |
| HLA-DRB1*13:10 | 0 | 426 | 1763 | 2242 |
| HLA-DRB1*13:11 | 45 | 919 | 1539 | 1928 |
| HLA-DRB1*13:12 | 0 | 777 | 1855 | 1799 |
| HLA-DRB1*13:22 | 153 | 1761 | 1375 | 1142 |
| HLA-DRB1*14:01 | 0 | 1586 | 1993 | 852 |
| HLA-DRB1*14:02 | 0 | 753 | 2094 | 1584 |
| HLA-DRB1*14:03 | 0 | 324 | 1630 | 2477 |
| HLA-DRB1*14:04 | 0 | 1249 | 2203 | 979 |
| HLA-DRB1*14:05 | 0 | 922 | 2051 | 1458 |
| HLA-DRB1*14:06 | 13 | 1462 | 1877 | 1079 |
| HLA-DRB1*14:07 | 0 | 628 | 2334 | 1469 |
| HLA-DRB1*14:08 | 0 | 922 | 2051 | 1458 |
| HLA-DRB1*14:09 | 5 | 1375 | 2104 | 947 |
| HLA-DRB1*14:10 | 0 | 695 | 1834 | 1902 |
| HLA-DRB1*14:12 | 0 | 769 | 1834 | 1828 |
| HLA-DRB1*14:13 | 0 | 794 | 2152 | 1485 |
| HLA-DRB1*14:14 | 0 | 327 | 1908 | 2196 |
| HLA-DRB1*14:18 | 0 | 467 | 1913 | 2051 |
| HLA-DRB1*14:54 | 0 | 1586 | 1993 | 852 |
| HLA-DRB1*15:01 | 9 | 1058 | 1468 | 1896 |
| HLA-DRB1*15:02 | 3 | 592 | 1691 | 2145 |
| HLA-DRB1*15:03 | 0 | 390 | 1366 | 2675 |
| HLA-DRB1*15:04 | 7 | 777 | 1547 | 2100 |
| HLA-DRB1*15:06 | 9 | 1058 | 1468 | 1896 |
| HLA-DRB1*15:11 | 2 | 475 | 1686 | 2268 |
| HLA-DRB1*16:01 | 3 | 624 | 1466 | 2338 |
| HLA-DRB1*16:02 | 10 | 1143 | 1806 | 1472 |
| HLA-DRB1*16:03 | 3 | 624 | 1466 | 2338 |
| HLA-DRB1*16:05 | 2 | 577 | 1695 | 2157 |

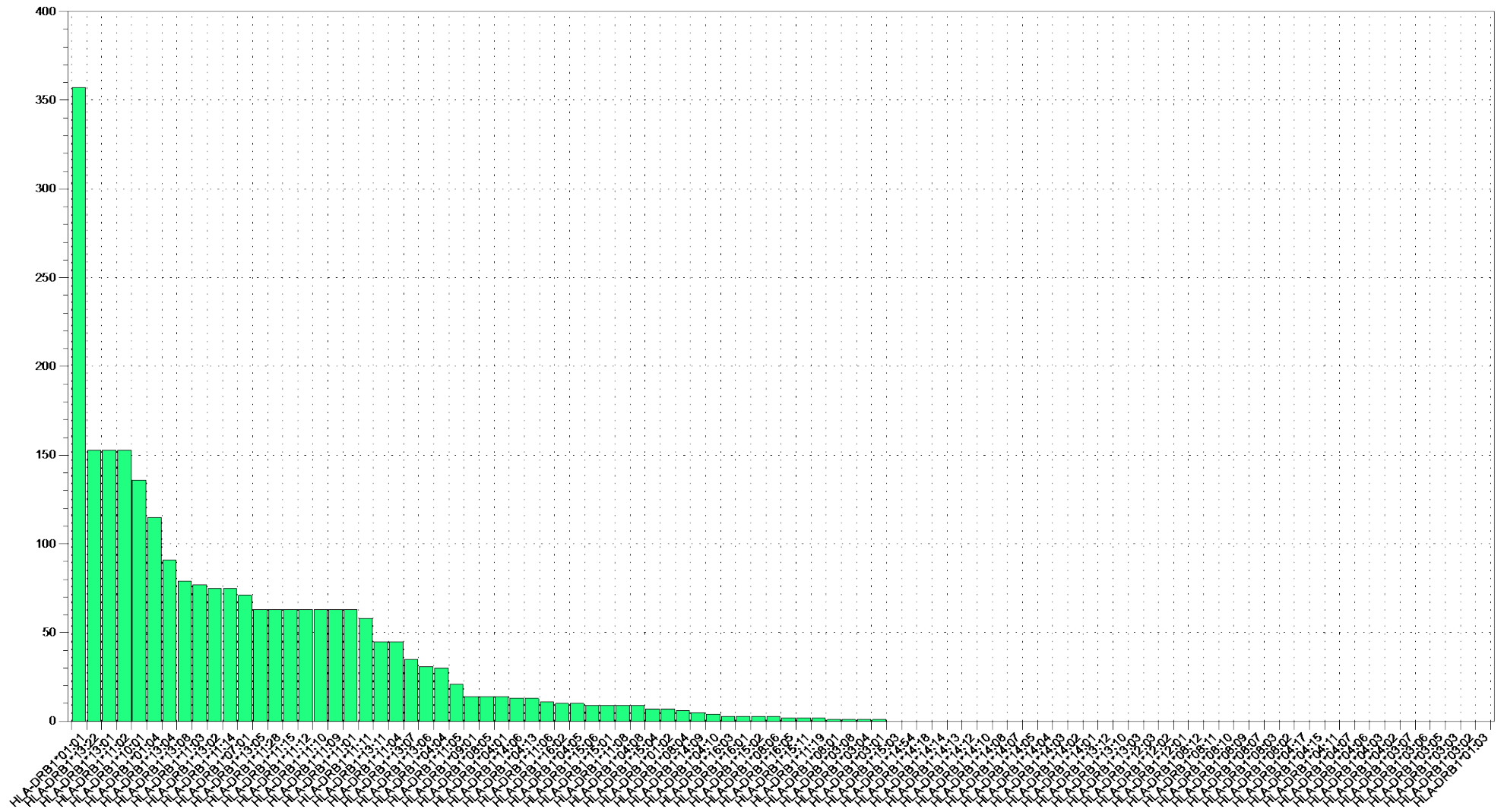
Alleles are ordered alphabetically.

General binding prediction tendencies for *HLA-DRB1*



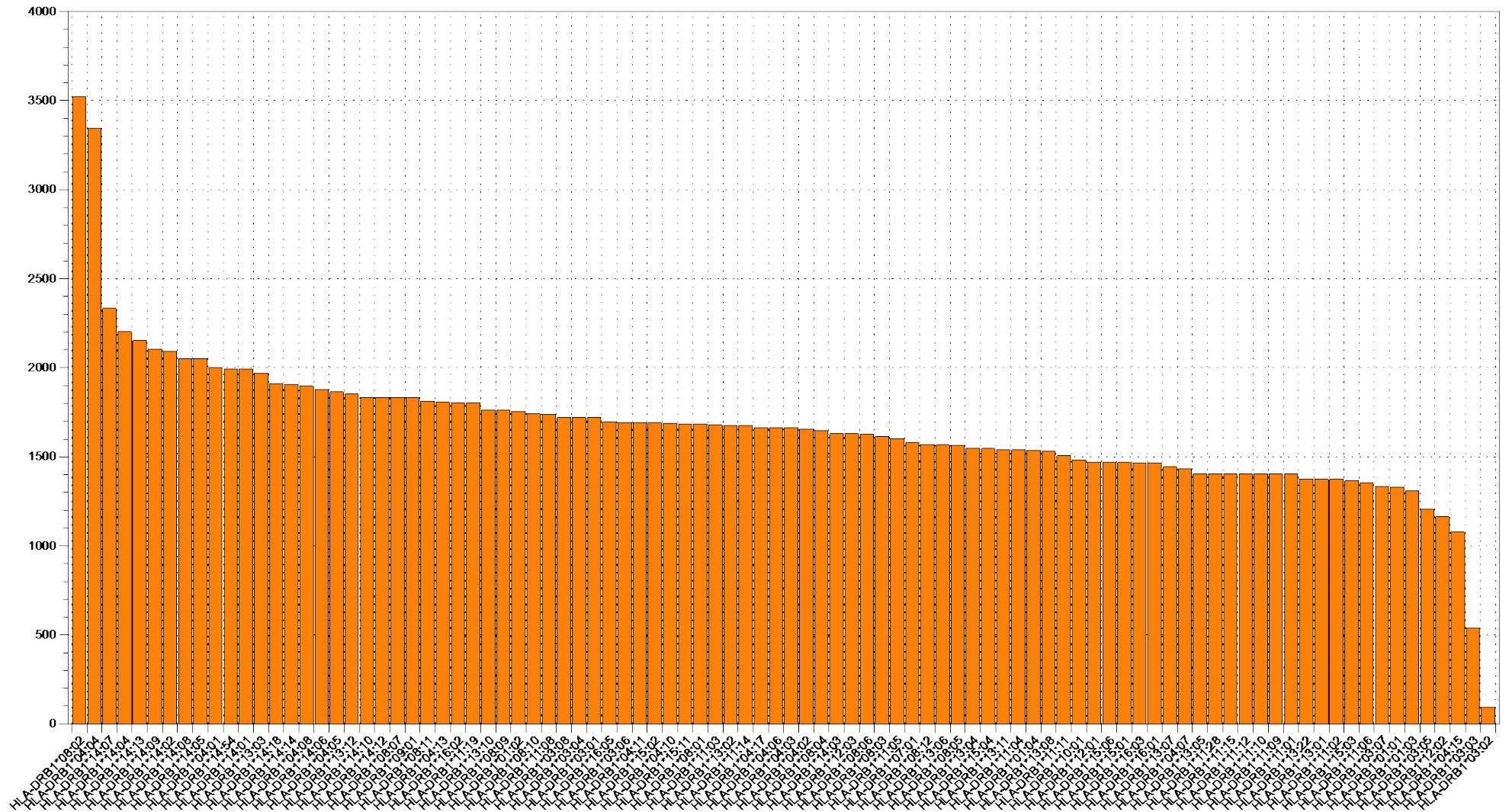
Alleles are ordered alphabetically on the x-axis, while the number of peptides binding with strong ($IC_{50} \leq 50$ nM), regular (50 nM $< IC_{50} \leq 1000$ nM) and weak (1000 nM $< IC_{50} \leq 5000$ nM) binding prediction are displayed on the y-axis.

HLA-DRB1 alleles ordered by number of presented peptides with strong binding prediction



Alleles are ordered on the x-axis by their strong ($IC_{50} \leq 50$ nM) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-DRB1 alleles ordered by number of presented peptides with weak binding prediction



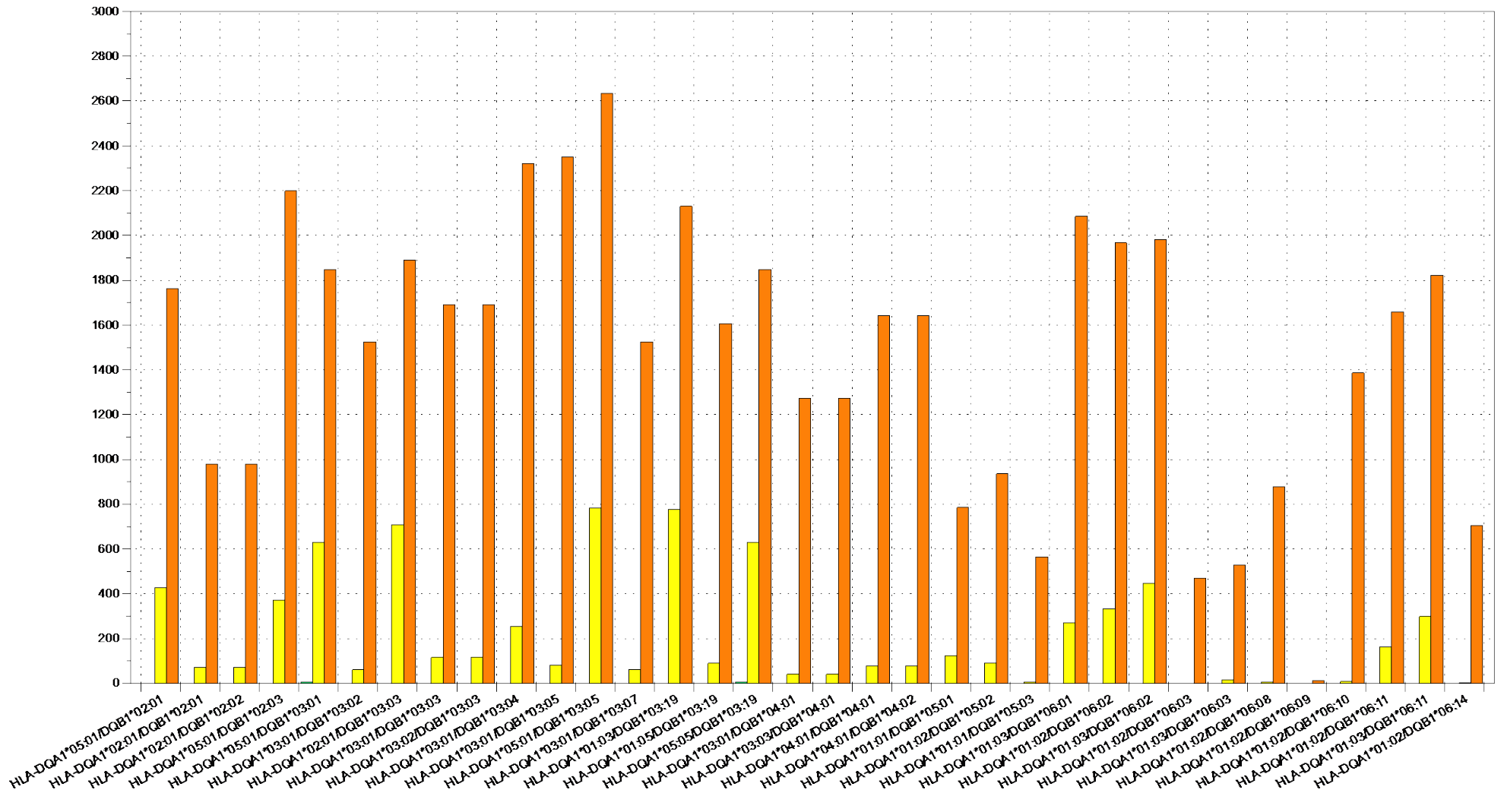
Alleles are ordered on the x-axis by their weak ($1000 \text{ nM} < IC_{50} \leq 5000 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.

Total number of peptides with strong, regular and weak binding predictions for *HLA-DQA1/-DQB1*

| | IC₅₀ ≤ 50 nM Strong binders | 50 nM < IC₅₀ ≤ 1000 nM Regular binders | 1000 nM < IC₅₀ ≤ 5000 nM Weak binders | IC₅₀ > 5000 nM Non binders |
|---------------------------|---|---|--|---|
| HLA-DQA1*05:01/DQB1*02:01 | 0 | 427 | 1763 | 2241 |
| HLA-DQA1*02:01/DQB1*02:01 | 0 | 71 | 978 | 3382 |
| HLA-DQA1*02:01/DQB1*02:02 | 0 | 71 | 978 | 3382 |
| HLA-DQA1*05:01/DQB1*02:03 | 0 | 372 | 2199 | 1860 |
| HLA-DQA1*05:01/DQB1*03:01 | 7 | 631 | 1848 | 1945 |
| HLA-DQA1*03:01/DQB1*03:02 | 0 | 60 | 1525 | 2846 |
| HLA-DQA1*02:01/DQB1*03:03 | 1 | 709 | 1891 | 1830 |
| HLA-DQA1*03:01/DQB1*03:03 | 0 | 116 | 1692 | 2623 |
| HLA-DQA1*03:02/DQB1*03:03 | 0 | 116 | 1692 | 2623 |
| HLA-DQA1*03:01/DQB1*03:04 | 0 | 254 | 2321 | 1856 |
| HLA-DQA1*03:01/DQB1*03:05 | 0 | 82 | 2351 | 1998 |
| HLA-DQA1*05:01/DQB1*03:05 | 0 | 783 | 2636 | 1012 |
| HLA-DQA1*03:01/DQB1*03:07 | 0 | 60 | 1525 | 2846 |
| HLA-DQA1*01:03/DQB1*03:19 | 1 | 778 | 2131 | 1521 |
| HLA-DQA1*01:05/DQB1*03:19 | 0 | 90 | 1607 | 2734 |
| HLA-DQA1*05:05/DQB1*03:19 | 7 | 631 | 1848 | 1945 |
| HLA-DQA1*03:01/DQB1*04:01 | 0 | 41 | 1273 | 3117 |
| HLA-DQA1*03:03/DQB1*04:01 | 0 | 41 | 1273 | 3117 |
| HLA-DQA1*04:01/DQB1*04:01 | 0 | 77 | 1642 | 2712 |
| HLA-DQA1*04:01/DQB1*04:02 | 0 | 77 | 1642 | 2712 |
| HLA-DQA1*01:01/DQB1*05:01 | 0 | 123 | 785 | 3523 |
| HLA-DQA1*01:02/DQB1*05:02 | 0 | 90 | 935 | 3406 |
| HLA-DQA1*01:01/DQB1*05:03 | 0 | 6 | 565 | 3860 |
| HLA-DQA1*01:03/DQB1*06:01 | 0 | 270 | 2086 | 2075 |
| HLA-DQA1*01:02/DQB1*06:02 | 0 | 333 | 1967 | 2131 |
| HLA-DQA1*01:03/DQB1*06:02 | 0 | 447 | 1980 | 2004 |
| HLA-DQA1*01:02/DQB1*06:03 | 0 | 0 | 471 | 3960 |
| HLA-DQA1*01:03/DQB1*06:03 | 0 | 16 | 529 | 3886 |
| HLA-DQA1*01:02/DQB1*06:08 | 0 | 7 | 878 | 3546 |
| HLA-DQA1*01:02/DQB1*06:09 | 0 | 0 | 12 | 4419 |
| HLA-DQA1*01:02/DQB1*06:10 | 0 | 8 | 1386 | 3037 |
| HLA-DQA1*01:02/DQB1*06:11 | 0 | 164 | 1658 | 2609 |
| HLA-DQA1*01:03/DQB1*06:11 | 0 | 299 | 1823 | 2309 |
| HLA-DQA1*01:02/DQB1*06:14 | 0 | 2 | 704 | 3725 |

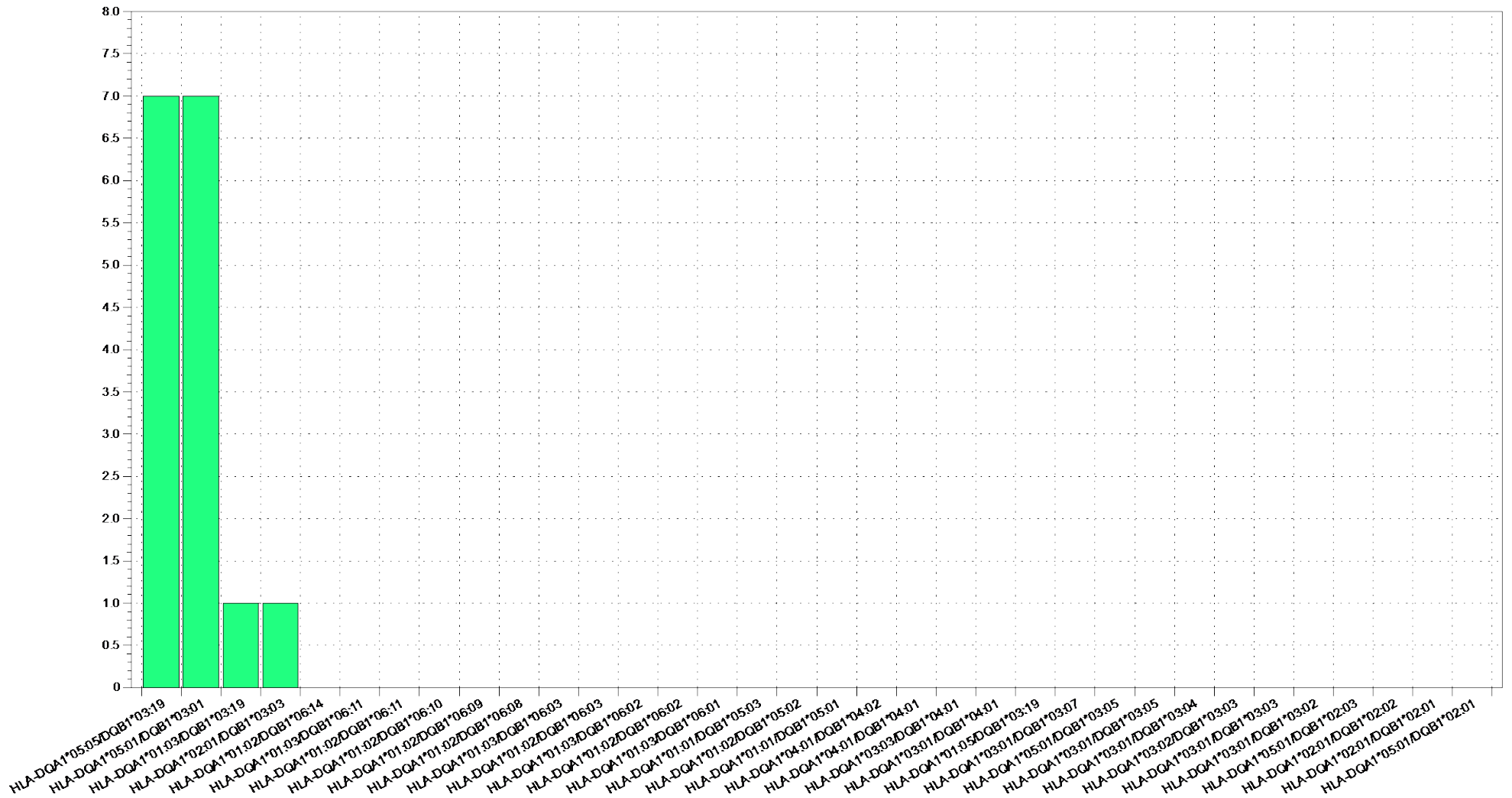
Allele combinations are ordered alphabetically.

General binding prediction tendencies for *HLA-DQA1/DQB1*



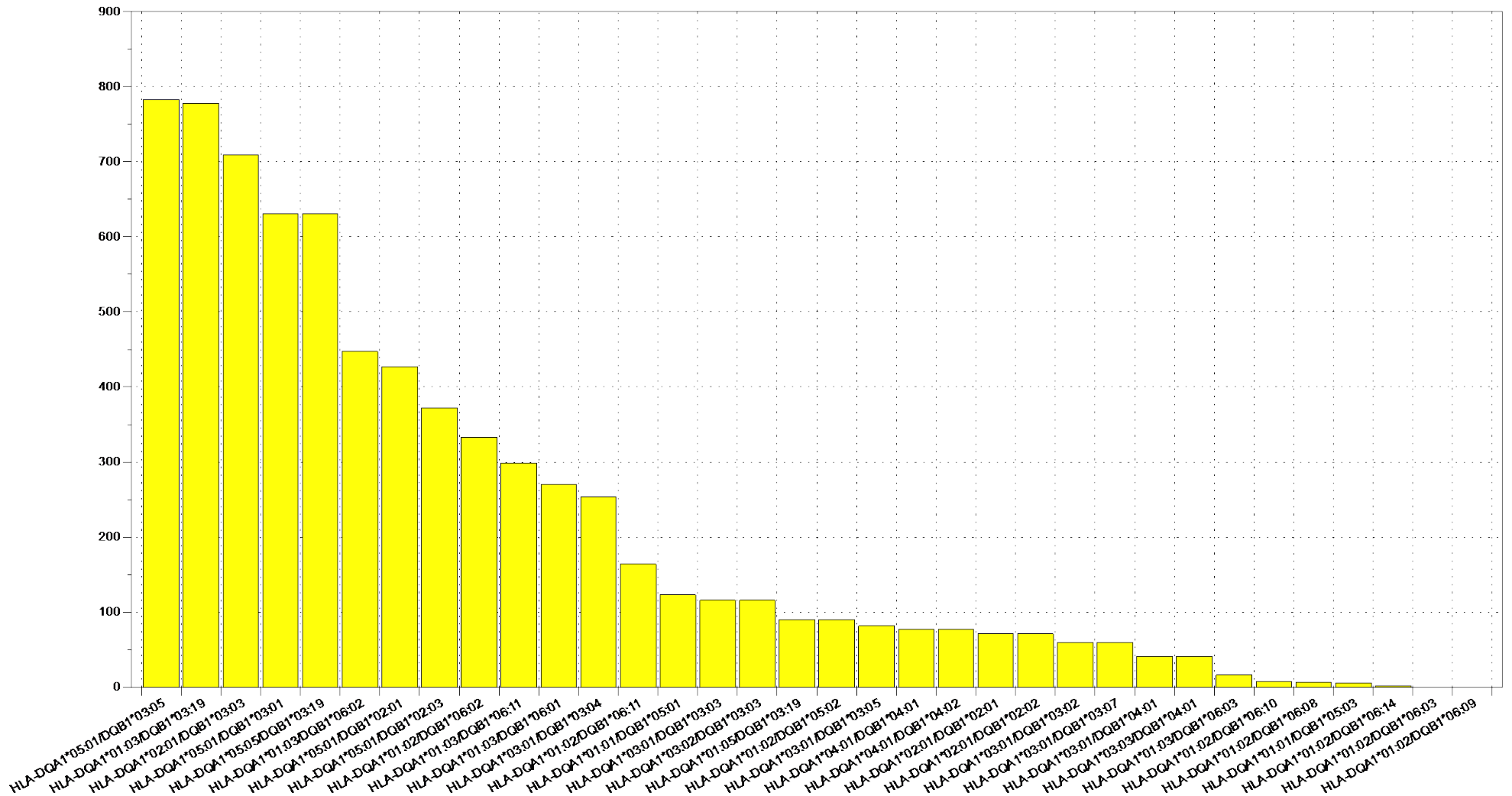
Allele combinations are ordered alphabetically on the x-axis, while the number of peptides binding with strong ($IC_{50} \leq 50$ nM), regular (50 nM $< IC_{50} \leq 1000$ nM) and weak (1000 nM $< IC_{50} \leq 5000$ nM) binding prediction are displayed on the y-axis.

HLA-DQA1/-DQB1 alleles ordered by number of presented peptides with strong binding prediction



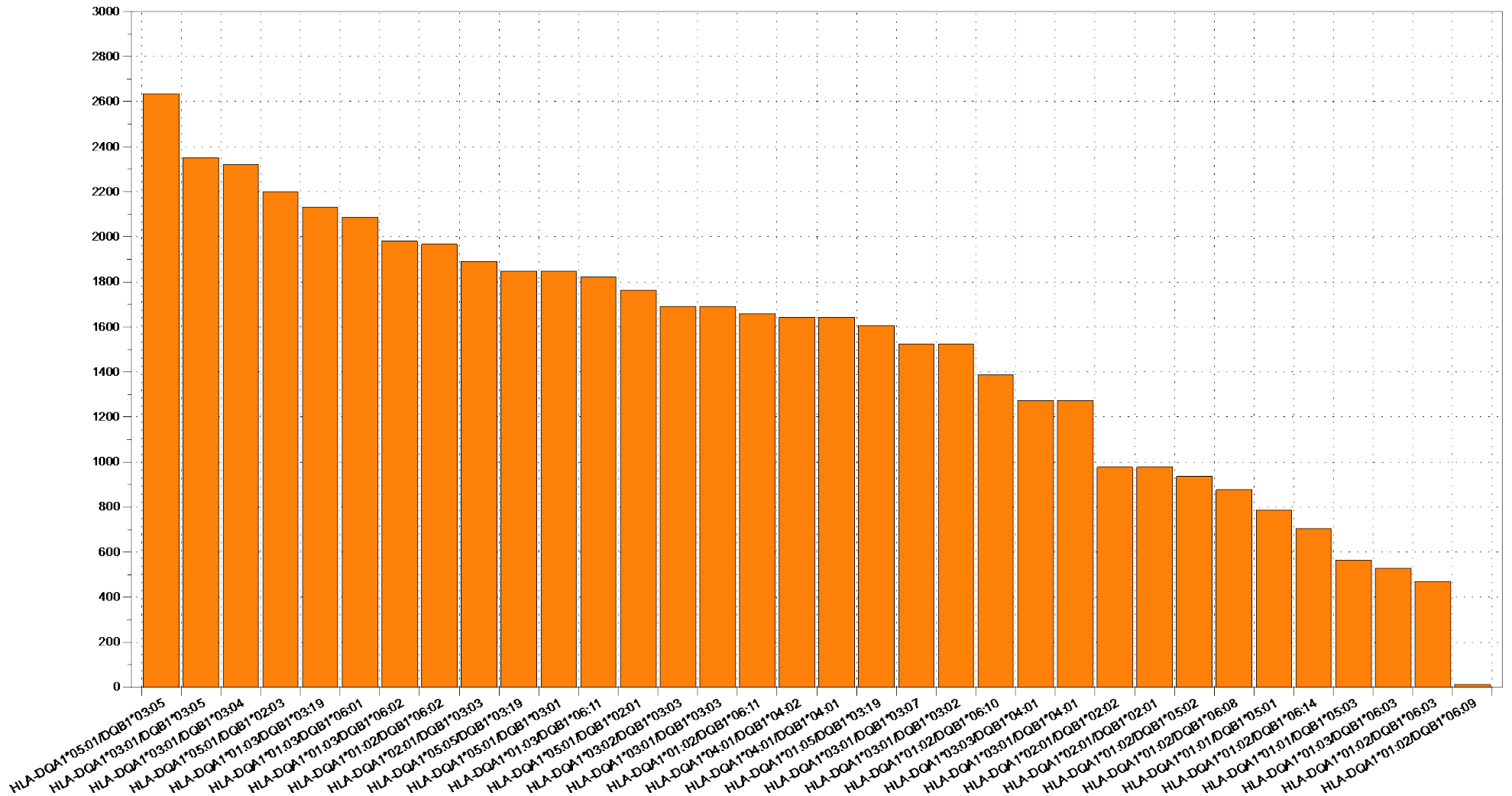
Allele combinations are ordered on the x-axis by their strong ($IC_{50} \leq 50$ nM) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-DQA1/-DQB1 alleles ordered by number of presented peptides with regular binding prediction



Allele combinations are ordered on the x-axis by their regular (50 nM < IC₅₀ ≤ 1000 nM) binding prediction and the number of peptides presented are displayed on the y-axis.

HLA-DQA1/-DQB1 alleles ordered by number of presented peptides with weak binding prediction



Allele combinations are ordered on the x-axis by their weak ($1000 \text{ nM} < IC_{50} \leq 5000 \text{ nM}$) binding prediction and the number of peptides presented are displayed on the y-axis.