Gel Documentation Form and Worksheet

DPB1

(101.311-24/04 – 24u/04u) Lot No: 9K5 Expiry Date: 2024-03-01

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sample ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA Conc.(ng/ul):\_\_\_\_\_\_\_\_\_

Test Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tested By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Review Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reviewed By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_

*Interpretation:\_\_\_\_\_\_\_\_\_\_\_ Failed lanes: \_\_\_\_\_\_\_\_\_\_\_ Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Gel Picture**

|  |
| --- |
| PHOTO DOCUMENT |







Abbreviations

ICB: Internal Control Band

AmpS: Amplicon Size

**Notes:**

Product sizes are approximate. For detailed information, see the lot-specific Specificity Table and Interpretation Table.

This table is intended as a guide. For interpretation always use the Interpretation Table and/or Specificity Table.

HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

Primer mixes 9, 27, 43, 47 and 58 may give rise to a lower yield of HLA-specific PCR product than the other DPB1 primer mixes.

Primer mixes 3, 12, 26, 37, 41, 80 and 90 may have a tendency to giving rise to primer oligomer formation, most pronounced for primer mix 90.

Primer mixes 23, 25, 32, 38, 41, 42, 45, 49, 50, 62, 68, 84, 85, 86, 89 and 93 may have tendencies of unspecific amplifications.

In primer mix 48 the specific PCR product of 280 base pairs may give rise to a lower yield of HLA-specific PCR product than the other DPB1 primer mixes. Optimized gel electrophoresis run time may need to be considered to ensure separation from the control band.

Primer mix 96 contains a negative control, which will amplify the majority of the HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 200 base pairs.



 























**1**DPB1 alleles listed on the IMGT/HLA web page 2018-July-10, release 3.33.0, [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla).

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3** The following DPB1 primer mixes have two or more product sizes:

|  |  |  |
| --- | --- | --- |
| Primer Mix | Size of spec. PCR product | Amplified DPB1alleles |
| **11** | 145 bp185 bp | \*69:01:01:01-69:01:01:02, 136:01, 179:01, 207:01, 303:01, 309:01, 322:01, 458:01:01-458:01:02, 644:01, 659:01, 930:01\*02:01:02:01-02:01:42, 02:01:44-02:01:55, 04:01:01:01-04:01:06, 04:01:08-04:01:10, 04:01:12-04:02:15, 23:01:01:01-23:01:02, 24:01, 32:01, 33:01:01:01-33:01:01:05, 41:01:01:01-41:01:02, 46:01:01-46:01:02, 47:01:01:01-47:01:01:03, 51:01:01:01-51:01:01:02, 59:01, 60:01, 66:01, 71:01:01-71:01:02, 72:01:01:01-72:01:01:03, 73:01, 75:01, 77:01, 80:01, 81:01:01:01-81:01:02, 82:01, 83:01, 86:01, 94:01, 99:01, 105:01:01:01-105:01:01:10, 108:01, 109:01, 113:01, 115:01, 119:01, 120:01N, 121:01, 123:01, 126:01:01:01-126:01:01:02, 128:01, 129:01, 134:01, 138:01, 141:01, 143:01, 144:01, 145:01, 146:01, 149:01, 151:01, 153:01, 154:01N, 155:01:01-155:01:02, 163:01, 164:01, 169:01, 174:01, 175:01, 176:01, 177:01, 178:01, 179:01, 180:01, 181:01, 183:01, 185:01, 186:01, 187:01, 188:01, 189:01, 190:01, 191:01, 192:01, 193:01, 194:01, 195:01, 196:01, 199:01, 200:01, 210:01, 211:01, 212:01, 213:01:01-213:01:02, 214:01, 215:01, 216:01N, 217:01, 218:01N, 219:01, 224:01, 225:01, 227:01:01-227:01:02, 228:01, 229:01, 231:01, 232:01, 233:01, 235:01, 236:01:01-236:01:02, 237:01, 238:01, 239:01, 240:01, 252:01, 253:01, 254:01, 255:01, 256:01, 257:01, 258:01, 260:01, 261:01, 262:01, 263:01, 271:01, 272:01, 273:01, 275:01, 276:01, 278:01, 281:01, 282:01, 283:01, 286:01, 294:01, 297:01, 298:01, 302:01, 303:01, 306:01, 307:01, 308:01, 309:01, 310:01, 311:01, 318:01, 319:01, 320:01, 321:01, 322:01, 323:01, 334:01:01-334:01:02, 335:01, 336:01, 338:01, 339:01, 341:01, 342:01, 344:01, 350:01, 352:01:01-352:01:02, 355:01, 356:01, 357:01N, 359:01, 360:01, 364:01, 365:01, 366:01, 367:01, 368:01, 369:01, 372:01, 373:01, 374:01, 375:01, 376:01, 377:01, 378:01, 380:01, 381:01, 382:01N, 392:01, 396:01, 397:01, 399:01, 401:01N, 402:01, 414:01:01:01-414:01:01:02, 415:01, 416:01:01:01-416:01:02, 418:01, 419:01, 420:01, 421:01, 423:01:01-423:01:02, 424:01, 425:01, 426:01, 427:01, 428:01, 429:01, 430:01, 432:01, 433:01, 434:01, 435:01, 443:01, 444:01, 451:01, 452:01, 453:01, 455:01N, 456:01, 457:01, 459:01, 461:01, 463:01:01:01-463:01:01:03, 464:01, 465:01, 468:01, 469:01, 475:01, 476:01, 477:01, 479:01, 485:01, 486:01, 487:01, 488:01, 489:01, 494:01, 497:01, 500:01, 501:01, 502:01, 508:01, 510:01, 511:01, 520:01, 521:01, 522:01, 523:01:01-523:01:02, 524:01, 525:01, 528:01, 529:01, 534:01, 537:01, 539:01, 540:01, 549:01, 551:01N, 553:01, 554:01, 555:01, 556:01, 557:01, 559:01, 569:01, 570:01N, 571:01, 574:01, 575:01, 576:01, 577:01, 578:01, 579:01, 581:01, 582:01, 583:01, 586:01, 591:01, 592:01, 593:01, 594:01, 595:01, 596:01, 601:01, 602:01, 603:01, 604:01, 605:01, 606:01, 607:01, 614:01, 615:01, 617:01, 618:01, 620:01, 622:01, 624:01, 625:01, 626:01, 627:01, 628:01, 637:01, 639:01, 640:01, 641:01, 642:01, 643:01, 646:01, 647:01, 655:01, 656:01, 658:01, 659:01, 660:01, 665:01, 666:01, 670:01, 674:01, 677:01, 678:01, 679:01, 680:01, 681:01, 682:01, 683:01, 685:01, 687:01, 690:01, 692:01, 693:01N, 694:01, 696:01N, 699:01, 700:01N, 701:01, 702:01, 722:01, 723:01, 724:01N, 725:01, 726:01, 730:01, 731:01, 734:01, 735:01, 736:01, 739:01, 740:01, 741:01, 742:01, 743:01N, 747:01, 748:01N, 750:01, 751:01, 753:01, 754:01N, 755:01, 756:01N, 757:01, 758:01, 759:01, 761:01, 762:01, 763:01, 765:01, 767:01, 769:01, 770:01, 771:01, 772:01, 773:01, 774:01, 775:01, 776:01, 777:01N, 780:01, 781:01, 782:01, 783:01, 784:01, 786:01:01N-786:01:02N, 787:01, 788:01, 795:01, 796:01, 799:01, 803:01, 804:01, 805:01, 806:01:01:01-806:01:01:02, 808:01, 809:01, 811:01, 812:01, 813:01, 814:01, 817:01, 818:01, 819:01, 820:01, 823:01, 824:01:01-824:01:02, 826:01, 827:01, 828:01, 831:01N, 836:01, 837:01, 838:01N, 840:01, 841:01, 842:01, 843:01, 844:01N, 845:01, 849:01, 850:01, 852:01, 857:01, 858:01, 859:01, 861:01, 863:01, 867:01N, 868:01N, 869:01N, 871:01N, 872:01N, 874:01N, 875:01N, 877:01N, 878:01N, 880:01, 881:01, 882:01, 884:01, 885:01, 887:01, 889:01, 890:01, 894:01N, 895:01, 911:01N, 915:01, 919:01N, 921:01, 925:01N, 926:01, 927:01, 932:01, 933:01, 936:01Q, 939:01, 954:01, 955:01, 957:01, 958:01, 959:01N, 963:01, 964:01, 966:01, 967:01, 972:01, 973:01, 974:01N, 975:01, 978:01, 981:01, 985:01N, 987:01, 988:01, 989:01, 992:01, 993:01, 997:01, 1001:01, 1002:01, 1003:01, 1004:01, 1005:01, 1010:01, 1011:01, 1013:01, 1016:01, 1020:01, 1023:01, 1025:01, 1028:01, 1031:01, 1033:01, 1035:01, 1036:01, 1037:01, 1040:01, 1042:01, 1044:01N, 1048:01, 1051:01, 1053:01, 1055:01, 1056:01, 1059:01, 1060:01, 1062:01, 1064:01, 1066:01 |
| **14** | 105 bp 175 bp | \*02:02:01:01-02:02:03, 05:01:01:01-05:01:02, 05:01:04-05:01:11, 21:01, 22:01:01:01-22:01:01:02, 36:01, 38:01, 97:01, 100:01, 101:01, 114:01, 135:01, 140:01, 170:01, 171:01, 223:01, 226:01, 300:01, 301:01, 317:01, 330:01, 331:01, 395:01, 406:01, 473:01, 478:01, 495:01, 496:01, 547:01, 550:01, 560:01, 573:01, 587:01, 588:01, 589:01, 590:01, 598:01N, 611:01, 619:01, 638:01, 657:01N, 668:01:01:01-668:01:01:02, 697:01Q, 721:01, 729:01, 744:01, 746:01, 764:01, 766:01, 778:01, 779:01, 790:01, 798:01, 802:01, 847:01, 848:01, 851:01, 860:01, 923:01, 928:01, 929:01, 951:01, 961:01, 962:01, 971:01, 1015:01, 1018:01, 1019:01, 1026:01, 1058:01, 1061:01, 1070:01N\*21:01, 30:01:01:01-30:01:01:02, 36:01, 54:01, 114:01, 390:01, 408:01, 550:01, 715:01, 717:01, 718:01, 746:01, 961:01, 980:01, 1008:01, 1019:01 |
| **16** | 80 bp165 bp 210 bp | \*03:01:01:01-03:01:12, 04:02:01:01-04:02:01:15, 04:02:02, 04:02:03-04:02:15, 14:01:01:01-14:01:12, 18:01:01:01-18:01:03, 20:01:01:01-20:01:04, 25:01, 28:01, 35:01:01, 45:01, 49:01:01:01-49:01:01:03, 50:01, 51:01:01:01-51:01:01:02, 53:01, 57:01, 59:01, 60:01, 61:01N, 68:01, 70:01, 73:01, 75:01, 76:01, 77:01, 78:01, 79:01, 80:01, 82:01, 83:01, 91:01:01:01-91:01:02, 92:01, 98:01, 104:01:01:01-104:01:03, 105:01:01:01-105:01:01:10, 108:01, 111:01, 116:01, 119:01, 122:01, 124:01:01:01-124:01:02:02, 129:01, 130:01, 132:01, 143:01, 144:01, 153:01, 164:01, 183:01, 184:01, 185:01, 197:01, 203:01:01-203:01:02, 210:01, 214:01, 219:01, 221:01, 222:01, 242:01, 243:01, 248:01, 252:01, 256:01, 257:01, 259:01, 260:01, 263:01, 270:01, 271:01, 274:01, 285:01, 286:01, 292:01, 293:01, 296:01, 307:01, 308:01, 312:01, 316:01, 321:01, 329:01, 338:01, 342:01, 351:01, 355:01, 363:01, 364:01, 365:01, 368:01, 369:01, 373:01, 374:01, 379:01, 380:01, 383:01, 385:01, 391:01, 394:01, 402:01, 404:01, 405:01, 409:01, 420:01, 424:01, 429:01, 431:01, 439:01, 442:01, 443:01, 445:01, 446:01, 463:01:01:01-463:01:01:03, 466:01, 472:01, 477:01, 484:01w, 488:01, 491:01, 492:01, 494:01, 498:01, 499:01, 506:01, 507:01N, 508:01, 509:01, 525:01, 532:01, 536:01, 539:01, 540:01, 545:01, 548:01, 549:01w, 568:01, 571:01, 572:01, 574:01, 577:01, 586:01, 594:01, 595:01, 596:01, 605:01, 606:01, 610:01, 613:01, 620:01, 621:01, 624:01, 627:01, 629:01, 645:01, 646:01, 647:01, 648:01:01:01-648:01:01:02, 651:01, 664:01, 665:01, 669:01, 671:01, 674:01, 675:01, 676:01, 688:01, 689:01, 690:01, 691:01N, 693:01N, 701:01, 704:01, 705:01, 706:01, 712:01N, 724:01N, 725:01, 726:01, 727:01, 728:01, 730:01, 731:01, 734:01, 735:01, 736:01, 741:01, 752:01, 759:01, 760:01, 762:01, 763:01, 775:01, 776:01, 777:01N, 782:01, 792:01N, 794:01N, 801:01, 805:01, 809:01, 817:01, 818:01, 823:01, 829:01, 832:01, 834:01, 839:01, 841:01, 854:01, 855:01, 858:01, 876:01N, 881:01, 883:01, 885:01, 887:01, 891:01, 892:01, 897:01, 898:01, 900:01, 905:01, 917:01N, 918:01, 925:01N, 927:01, 933:01, 935:01Q, 936:01Q, 938:01, 941:01N, 942:01, 943:01, 946:01, 948:01, 949:01, 950:01N, 952:01, 954:01, 958:01, 959:01N, 970:01, 981:01, 983:01, 985:01N, 986:01N, 987:01, 990:01, 994:01, 995:01N, 1000:01, 1005:01, 1013:01, 1014:01, 1020:01, 1021:01, 1025:01, 1027:01, 1030:01, 1031:01, 1035:01, 1037:01, 1039:01, 1041:01N, 1049:01, 1071:01\*99:01, 220:01\*127:01  |
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| **24** | 195 bp 265 bp | \*101:01\*05:01:01:01-05:01:11, 08:01, 16:01:01:01-16:01:03, 19:01:01:01-19:01:01:03, 22:01:01:01-22:01:01:02, 31:01:01:01-31:01:01:02, 38:01, 57:01, 63:01, 65:01:01-65:01:02, 68:01, 84:01, 97:01, 102:01, 103:01, 106:01, 135:01, 140:01, 147:01, 150:01, 152:01, 165:01, 166:01, 170:01, 171:01, 173:01, 182:01, 184:01, 226:01, 234:01, 259:01, 277:01, 284:01, 285:01, 300:01, 301:01, 304:01, 305:01, 317:01, 331:01, 337:01, 340:01, 358:01, 379:01, 395:01, 398:01, 400:01, 422:01, 442:01, 466:01, 473:01, 495:01, 527:01, 533:01, 535:01, 538:01, 558:01, 560:01, 573:01, 587:01, 588:01, 598:01N, 611:01, 619:01, 638:01, 648:01:01:01-648:01:01:02, 652:01, 653:01, 657:01N, 668:01:01:01-668:01:01:02, 684:01, 697:01Q, 720:01, 729:01, 740:01, 744:01, 764:01, 778:01, 785:01, 789:01, 790:01, 798:01, 802:01, 847:01, 848:01, 851:01, 860:01, 864:01, 886:01, 898:01, 904:01, 922:01, 923:01, 929:01, 940:01, 944:01, 945:01, 951:01, 965:01:01:01-965:01:01:02, 968:01, 971:01, 976:01, 982:01, 994:01, 1015:01, 1018:01, 1026:01, 1058:01, 1061:01 |
| **25** | 200 bp 265 bp | \*05:01:01:01-05:01:11, 21:01, 22:01:01:01-22:01:01:02, 36:01, 38:01, 44:01, 58:01, 63:01, 97:01, 114:01, 135:01, 140:01, 170:01, 171:01, 220:01, 223:01, 226:01, 265:01, 300:01, 301:01, 317:01, 331:01, 384:01, 394:01, 395:01, 473:01, 495:01, 550:01, 560:01, 563:01, 573:01, 587:01, 588:01, 598:01N, 599:01, 611:01, 619:01, 630:01, 638:01, 657:01N, 668:01:01:01-668:01:01:02, 697:01Q, 729:01, 744:01, 746:01, 764:01, 778:01, 789:01, 790:01, 798:01, 802:01, 847:01, 848:01, 851:01, 860:01, 898:01, 923:01, 929:01, 951:01, 971:01, 994:01, 1015:01, 1018:01, 1019:01, 1026:01, 1058:01, 1061:01\*70:01 |
| **26**  | 75 bp 205 bp | \*06:01:01:01-06:01:05, 09:01:01-09:01:05, 17:01:01:01-17:01:03, 29:01, 44:01, 46:01:01-46:01:02, 64:01N, 86:01, 88:01, 101:01, 131:01:01:01-131:01:03, 152:01, 156:01, 157:01, 161:01N, 166:01, 168:01, 182:01, 208:01, 234:01, 235:01, 241:01, 245:01, 249:01, 251:01, 266:01, 287:01, 288:01, 289:01, 332:01, 343:01, 361:01, 384:01, 386:01, 407:01, 413:01, 447:01, 460:01, 504:01, 505:01, 530:01, 546:01, 555:01, 566:01, 567:01, 581:01, 601:01, 630:01, 662:01, 684:01, 698:01, 714:01, 719:01, 737:01, 738:01N, 797:01, 815:01, 833:01, 846:01, 899:01, 906:01, 909:01, 914:01, 920:01, 944:01, 956:01, 977:01, 1009:01, 1017:01, 1022:01, 1032:01, 1043:01, 1047:01, 1052:01, 1067:01\*123:01 |
| **27**  | 95 bp215 bp240 bp | \*06:01:01:01-06:01:05, 17:01:01:01-17:01:03, 20:01:01:01-20:01:04, 46:01:01-46:01:02, 64:01N, 69:01:01:01-69:01:01:02, 80:01, 86:01, 91:01:01:01-91:01:02, 98:01, 108:01, 130:01, 131:01:01:01-131:01:03, 152:01, 156:01, 161:01N, 164:01, 166:01, 168:01, 182:01, 197:01, 205:01, 208:01, 214:01, 235:01, 241:01, 245:01, 251:01, 259:01, 287:01, 292:01, 332:01, 343:01, 355:01, 361:01, 379:01, 384:01, 407:01, 413:01, 447:01, 460:01, 484:01, 530:01, 540:01, 546:01, 555:01, 566:01, 567:01, 581:01, 601:01, 613:01, 662:01, 684:01, 689:01, 698:01, 719:01, 737:01, 738:01N, 762:01, 846:01, 905:01, 906:01, 914:01, 920:01, 944:01, 956:01, 994:01, 1017:01, 1022:01, 1032:01, 1047:01, 1052:01, 1067:01\*169:01, 252:01, 582:01, 772:01\*15:01:01:01-15:01:01:04, 15:01:03, 18:01:01:01-18:01:03, 89:01, 158:01, 198:01, 199:01, 200:01, 219:01, 246:01, 247:01, 290:01, 292:01, 345:01, 347:01, 369:01, 387:01, 471:01, 480:01, 482:01, 493:01, 561:01, 585:01:01:01-585:01:01:02, 608:01, 644:01, 747:01, 768:01, 821:01N, 896:01, 897:01, 900:01, 903:01, 910:01, 942:01, 1047:01, 1054:01 |
| **28** | 200 bp 260 bp | \*09:01:01-09:01:05, 10:01:01:01-10:01:05, 13:01:01:01-13:01:03, 17:01:01:01-17:01:03, 21:01, 26:01:01-26:01:03, 27:01, 30:01:01:01-30:01:01:02, 35:01:01, 36:01, 37:01, 54:01, 55:01:01:01-55:01:03, 58:01, 66:01, 79:01, 85:01:01:01-85:01:02, 86:01, 88:01, 93:01, 98:01, 107:01, 109:01, 110:01, 113:01, 117:01, 125:01, 129:01, 131:01:01:01-131:01:03, 132:01, 133:01, 137:01, 156:01, 157:01, 160:01, 168:01, 206:01, 209:01, 241:01, 244:01, 245:01, 251:01, 265:01, 269:01, 271:01, 287:01, 288:01, 289:01, 294:01, 295:01, 312:01, 313:01, 314:01, 324:01, 325:01, 343:01, 344:01, 361:01, 362:01, 370:01, 384:01, 386:01, 389:01, 390:01, 392:01, 393:01, 407:01, 408:01, 410:01, 412:01, 413:01, 438:01, 447:01, 448:01, 449:01, 460:01, 470:01, 490:01, 503:01, 504:01, 505:01, 514:01, 515:01, 518:01, 519:01, 530:01, 532:01, 540:01, 541:01, 544:01, 550:01, 552:01, 562:01, 563:01, 564:01, 565:01, 597:01, 600:01, 609:01, 612:01, 613:01, 621:01, 623:01, 630:01, 633:01, 634:01, 635:01, 636:01, 650:01, 663:01, 673:01, 698:01, 703:01, 708:01, 709:01, 713:01, 714:01, 716:01, 717:01, 719:01, 738:01N, 746:01, 791:01, 797:01, 815:01, 822:01, 825:01, 846:01, 873:01N, 888:01, 891:01, 893:01, 899:01, 901:01, 902:01, 908:01, 912:01, 920:01, 924:01, 943:01, 947:01, 956:01, 961:01, 977:01, 980:01, 991:01, 996:01, 1007:01, 1008:01, 1009:01, 1017:01, 1019:01, 1027:01, 1032:01, 1034:01, 1043:01, 1045:01N, 1052:01, 1057:01, 1065:01, 1067:01\*119:01 |
| **29** | 105 bp160 bp220 bp | \*141:01, 763:01, 826:01\*617:01, 699:01\*09:01:01-09:01:05, 10:01:01:01-10:01:05, 17:01:01:01-17:01:03, 30:01:01:01-30:01:01:02, 54:01, 55:01:01:01-55:01:03, 58:01, 86:01, 113:01, 131:01:01:01-131:01:03, 137:01, 156:01, 157:01, 167:01, 168:01, 241:01, 245:01, 265:01, 266:01, 287:01, 288:01, 289:01, 313:01, 314:01, 324:01, 325:01, 343:01, 344:01, 361:01, 384:01, 386:01, 407:01, 408:01, 410:01, 447:01, 460:01, 470:01, 503:01, 504:01, 505:01, 514:01, 515:01, 530:01, 630:01, 650:01, 673:01, 698:01, 714:01, 716:01, 719:01, 738:01N, 791:01, 797:01, 815:01, 833:01, 846:01, 899:01, 902:01, 908:01, 956:01, 977:01, 1007:01, 1009:01, 1017:01, 1032:01, 1043:01, 1052:01, 1067:01 |
| **31** | 120 bp215 bp | \*01:01:01:01-01:01:06, 05:01:01:01-05:01:02, 05:01:04-05:01:11, 08:01, 10:01:01:01-10:01:02, 10:01:04-10:01:05, 11:01:01:01-11:01:05, 13:01:01:01-13:01:03, 16:01:01:01-16:01:03, 19:01:01:01-19:01:01:03, 21:01, 22:01:01:01-22:01:01:02, 25:01, 26:01:01-26:01:03, 27:01, 30:01:01:01-30:01:01:02, 31:01:01:01-31:01:01:02, 36:01, 37:01, 38:01, 45:01, 52:01, 54:01, 55:01:01:01-55:01:03, 56:01, 58:01, 63:01, 65:01:01-65:01:02, 67:01, 68:01, 79:01, 84:01, 85:01:01:01-85:01:02, 87:01, 89:01, 90:01:01-90:01:02, 93:01, 97:01, 102:01, 103:01, 106:01, 107:01, 110:01, 114:01, 118:01, 122:01, 125:01, 127:01, 133:01, 135:01, 136:01, 137:01, 140:01, 142:01, 147:01, 150:01, 159:01N, 162:01:01-162:01:02, 165:01, 167:01, 170:01, 171:01, 173:01, 184:01, 201:01, 202:01, 204:01, 206:01, 207:01, 209:01, 220:01, 223:01, 226:01, 244:01, 246:01, 247:01, 250:01, 264:01, 265:01, 267:01, 268:01, 269:01, 277:01, 284:01, 285:01, 291:01, 295:01, 300:01, 301:01, 304:01, 305:01, 312:01, 313:01, 314:01, 315:01, 316:01, 317:01, 324:01, 325:01, 326:01, 327:01, 328:01N, 331:01, 337:01, 340:01, 346:01, 348:01:01-348:01:02, 349:01, 353:01, 358:01, 362:01, 370:01, 371:01, 388:01, 389:01, 390:01, 393:01, 395:01, 398:01, 400:01, 403:01N, 408:01, 410:01, 411:01, 412:01, 417:01:01-417:01:02, 422:01, 436:01, 437:01, 438:01, 448:01, 449:01, 450:01N, 458:01:01-458:01:02, 462:01, 466:01, 470:01, 473:01, 481:01, 483:01, 490:01, 495:01, 503:01, 514:01, 515:01, 516:01, 517:01, 518:01, 519:01, 527:01, 532:01, 533:01, 535:01, 538:01, 542:01, 543:01, 544:01, 550:01, 552:01, 558:01, 560:01, 562:01, 563:01, 564:01, 565:01, 573:01, 587:01, 588:01, 597:01, 598:01N, 599:01, 600:01, 608:01, 609:01, 611:01, 612:01, 616:01, 619:01, 623:01, 631:01, 632:01, 633:01, 634:01, 635:01, 636:01, 638:01, 649:01, 650:01, 652:01, 653:01, 654:01, 657:01N, 661:01N, 667:01, 668:01:01:01-668:01:01:02, 672:01, 673:01, 697:01Q, 703:01, 707:01, 708:01, 709:01, 710:01, 711:01, 713:01, 715:01, 716:01, 717:01, 718:01, 720:01, 729:01, 732:01N, 733:01, 740:01, 744:01, 746:01, 749:01, 764:01, 778:01, 785:01, 789:01, 790:01, 791:01, 798:01, 800:01N, 802:01, 807:01, 810:01, 822:01, 825:01, 832:01, 847:01, 848:01, 851:01, 853:01, 856:01, 860:01, 862:01N, 864:01, 866:01N, 870:01N, 873:01N, 879:01:01:01-879:01:01:03, 886:01, 888:01, 891:01, 892:01, 893:01, 898:01, 901:01, 902:01, 904:01, 907:01, 908:01, 912:01, 922:01, 923:01, 924:01, 929:01, 930:01, 931:01, 937:01, 940:01, 945:01, 947:01, 951:01, 953:01, 960:01N, 965:01:01:01-965:01:01:02, 968:01, 969:01, 971:01, 976:01, 979:01, 980:01, 982:01, 984:01N, 991:01, 996:01, 998:01, 999:01, 1006:01, 1007:01, 1008:01, 1012:01, 1015:01, 1018:01, 1019:01, 1024:01, 1026:01, 1034:01, 1038:01Q, 1050:01, 1057:01, 1061:01, 1063:01, 1065:01, 1068:01\*222:01 |
| **32**  | 75 bp 200 bp260 bp | \*78:01\*11:01:01:01-11:01:05, 130:01, 147:01, 202:01, 203:01:01-203:01:02, 204:01, 205:01, 250:01, 264:01, 268:01, 328:01N, 343:01, 353:01, 370:01, 388:01, 389:01, 405:01, 450:01N, 517:01, 623:01, 649:01, 654:01, 672:01, 707:01, 732:01N, 778:01, 856:01, 907:01, 930:01, 937:01, 1063:01\*223:01, 293:01, 1017:01 |
| **33** | 105 bp140 bp195 bp | \*76:01, 92:01, 156:01, 203:01:01-203:01:02, 205:01 214:01, 215:01, 287:01, 288:01, 355:01, 363:01, 385:01, 442:01, 536:01, 555:01, 566:01\*13:01:01:01-13:01:03, 33:01:01:01-33:01:01:05, 81:01:01:01-81:01:02, 107:01, 110:01, 117:01, 133:01, 156:01, 160:01, 172:01, 173:01, 198:01, 206:01, 229:01, 246:01, 247:01, 269:01, 277:01, 287:01, 288:01, 302:01, 304:01, 305:01, 362:01, 389:01, 393:01, 438:01, 449:01, 470:01, 474:01, 503:01, 514:01, 518:01, 519:01, 544:01, 555:01, 561:01, 564:01, 565:01, 566:01, 597:01, 600:01, 609:01, 612:01, 626:01, 631:01, 633:01, 663:01, 703:01, 711:01, 716:01, 720:01, 822:01, 873:01N, 888:01, 893:01, 904:01, 924:01, 947:01, 991:01, 996:01, 1008:01, 1045:01N, 1057:01, 1065:01\*123:01, 178:01, 218:01N |
| **37** | 160 bp185 bp  | \*13:01:01:01-13:01:03, 107:01, 110:01, 133:01, 160:01, 173:01, 246:01, 269:01, 278:01, 304:01, 362:01, 389:01, 393:01, 412:01, 449:01, 503:01, 518:01, 519:01, 538:01, 544:01, 564:01, 565:01, 597:01, 600:01, 612:01, 703:01, 720:01, 822:01, 873:01N, 888:01, 893:01, 924:01, 947:01, 991:01, 996:01, 1008:01, 1045:01N, 1057:01, 1065:01\*15:01:01:01-15:01:03, 28:01, 40:01:01:01-40:01:02, 53:01, 74:01, 139:01, 198:01, 290:01, 296:01, 299:01, 345:01, 387:01, 471:01, 482:01, 493:01, 499:01, 512:01, 585:01:01:01-585:01:01:02, 644:01, 683:01, 695:01, 745:01, 752:01, 768:01, 821:01N, 896:01, 900:01, 903:01, 910:01, 918:01, 1054:01 |
| **38** | 95 bp170 bp200 bp | \*23:01:01:01-23:01:02, 34:01:01:01-34:01:02, 52:01, 55:01:01:01-55:01:03, 58:01, 62:01, 63:01, 67:01, 71:01:01-71:01:02, 87:01, 95:01, 103:01, 112:01, 121:01, 138:01, 201:01, 209:01, 244:01, 295:01, 314:01, 322:01, 325:01, 333:01, 340:01, 371:01, 392:01, 435:01, 451:01, 458:01:01-458:01:02, 563:01, 576:01, 580:01, 599:01, 635:01, 787:01, 789:01, 830:01, 835:01:01:01-835:01:01:02, 908:01, 912:01, 913:01, 972:01\*186:01, 243:01, 657:01N, 787:01\*57:01?, 185:01, 611:01, 674:01 |
| **40** | 135 bp180 bp230 bp | \*275:01\*30:01:01:01-30:01:01:02, 54:01, 408:01, 715:01\*14:01:01:01-14:01:11, 35:01:01, 45:01, 66:01, 67:01, 76:01, 91:01:01:01-91:01:02, 98:01, 119:01, 125:01, 129:01, 197:01, 242:01, 243:01, 244:01, 312:01, 383:01, 385:01, 409:01, 445:01, 446:01, 490:01, 491:01, 492:01, 498:01, 503:01, 530:01, 540:01, 572:01, 629:01, 651:01, 671:01, 705:01, 715:01, 794:01N, 832:01, 834:01, 854:01, 891:01, 892:01, 908:01, 912:01, 949:01, 986:01N, 987:01, 990:01, 1029:01N |
| **41**  | 75 bp225 bp250 bp 280 bp | \*77:01, 245:01, 559:01 \*154:01N\*31:01:01:01-31:01:01:02, 34:01:01:01-34:01:02, 94:01, 176:01, 484:01, 493:01, 575:01, 580:01, 805:01, 835:01:01:01-835:01:01:02, 843:01, 913:01, 945:01\*134:01, 177:01 |
| **42** | 140 bp 185 bp210 bp 245 bp 285 bp | \*97:01\*32:01\*176:01, 180:01, 805:01\*128:01\*82:01, 301:01, 339:01, 400:01 |
| **44**  | 60 bp115 bp155 bp185 bp210 bp 240 bp 270 bp | \*282:01, 619:01\*99:01, 118:01, 220:01, 437:01, 453:01, 521:01\*38:01, 619:01, 698:01, 815:01\*111:01, 118:01, 120:01N, 437:01\*220:01\*38:01, 241:01\*64:01N |
| **45**  | 120 bp160 bp 190 bp 240 bp  | \*46:01:01-46:01:02, 80:01, 86:01, 108:01, 164:01, 214:01, 235:01, 254:01, 332:01, 355:01, 508:01, 540:01, 555:01, 581:01, 601:01, 620:01, 762:01, 987:01\*253:01\*39:01:01:01-39:01:03, 49:01:01:01-49:01:01:03, 96:01, 117:01, 158:01, 172:01, 354:01:01-354:01:02, 440:01, 441:01, 474:01, 480:01, 531:01, 561:01, 584:01:01:01-584:01:02:02, 663:01w 916:01, 943:01, 1039:01\*240:01 |
| **46** | 75 bp 210 bp | \*41:01:01:01-41:01:02, 60:01, 69:01:01:01-69:01:01:02, 83:01, 136:01, 204:01, 205:01, 229:01, 309:01, 581:01, 659:01, 903:01\*41:01:01:01-41:01:02, 60:01, 83:01, 96:01, 147:01, 179:01, 229:01, 299:01, 303:01, 309:01, 322:01, 581:01, 659:01 |
| **47** | 165 bp 215 bp | \*44:01, 114:01, 265:01, 394:01, 495:01, 599:01, 630:01, 746:01\*140:01 |
| **48** | 115 bp 210 bp 280 bp | \*56:01, 66:01, 76:01, 92:01, 110:01, 125:01, 156:01, 207:01, 288:01, 294:01, 470:01, 566:01, 709:01, 749:01, 930:01\*61:01N\*85:01:01:01-85:01:02, 515:01, 713:01, 901:01, 1034:01 |
| **49**  | 95 bp130 bp205 bp | \*149:01\*198:01, 290:01, 343:01, 354:01:01-354:01:02, 370:01, 375:01, 387:01, 389:01, 522:01, 623:01, 663:01, 903:01, 1039:01\*143:01, 251:01, 552:01, 840:01 |
| **50** | 160 bp210 bp | \*144:01, 146:01, 542:01, 637:01\*01:01:01:01-01:01:02:02, 01:01:04-01:01:06, 18:01:01:01-18:01:03, 89:01, 90:01:01-90:01:02, 118:01, 122:01, 127:01, 158:01, 159:01N, 162:01:01-162:01:02, 198:01, 199:01, 200:01, 201:01, 220:01, 246:01, 247:01, 248:01, 249:01, 267:01, 290:01, 291:01, 292:01, 315:01, 316:01, 326:01, 327:01, 346:01, 347:01, 369:01, 387:01, 403:01N, 417:01:01-417:01:02, 436:01, 440:01, 462:01, 481:01, 483:01, 536:01, 542:01, 543:01, 561:01, 599:01, 608:01, 616:01, 631:01, 632:01, 661:01N, 667:01, 710:01, 711:01, 733:01, 747:01, 800:01N, 807:01, 810:01, 853:01, 862:01N, 866:01N, 870:01N, 879:01:01:01-879:01:01:03, 897:01, 900:01, 903:01, 931:01, 942:01, 953:01, 960:01N, 969:01, 979:01, 984:01N, 998:01, 999:01, 1006:01, 1012:01, 1024:01, 1038:01Q, 1047:01, 1050:01, 1068:01 |
| **51** | 170 bp225 bp | \*145:01, 382:01N\*452:01, 570:01N |
| **52** | 130 bp160 bp215 bp | \*151:01\*511:01\*165:01, 289:01, 452:01, 570:01N |
| **53** | 90 bp145 bp175 bp200 bp | \*157:01, 321:01, 801:01\*221:01, 501:01, 573:01, 595:01\*391:01, 467:01, 712:01N, 770:01\*153:01, 163:01, 242:01 |
| **54** | 115 bp200 bp | \*161:01N, 505:01, 507:01N, 546:01\*04:01:01:24N, 159:01N, 160:01, 328:01N, 454:01, 683:01, 1045:01N |
| **55** | 135 bp165 bp190 bp | \*155:01:01-155:01:02\*382:01N, 511:01\*218:01N |
| **56** | 145 bp180 bp230 bp | \*174:01, 658:01\*84:01, 148:01\*170:01, 239:01, 260:01, 487:01 |
| **61** | 145 bp225 bp | \*168:01\*459:01 |
| **63** | 210 bp245 bp275 bp | \*183:01, 319:01\*216:01N\*57:01?, 280:01, 356:01, 539:01 |
| **64** | 145 bp180 bp215 bp | \*217:01, 256:01, 658:01, 1040:01\*232:01, 475:01\*226:01 |
| **65** | 170 bp205 bp240 bp | \*181:01, 257:01, 258:01, 475:01\*604:01\*238:01, 1066:01 |
| **66** | 185 bp235 bp280 bp | \*276:01, 418:01, 432:01, 697:01Q\*239:01, 260:01, 487:01\*57:01?, 356:01, 455:01N, 539:01  |
| **67** | 90 bp155 bp180 bp210 bp | \*504:01, 781:01\*501:01, 712:01N\*261:01, 380:01, 657:01N\*674:01 |
| **68** | 175 bp200 bp265 bp | \*228:01, 334:01:01, 522:01, 594:01\*191:01, 192:01, 310:01, 342:01\*109:01, 117:01, 158:01, 164:01, 199:01, 200:01, 271:01, 294:01, 369:01, 392:01, 440:01, 480:01, 508:01, 531:01, 561:01, 601:01, 663:01, 679:01, 943:01, 961:01 |
| **69** | 180 bp215 bp245 bp | \*227:01:01, 228:01, 646:01, 682:01\*520:01\*210:01, 211:01, 240:01, 272:01 |
| **70** | 75 bp115 bp155 bp180 bp215 bp260 bp | \*476:01, 751:01\*551:01N\*253:01, 286:01, 660:01\*334:01:01, 522:01, 594:01\*262:01, 263:01, 681:01\*196:01, 596:01 |
| **71** | 140 bp180 bp260 bp | \*208:01, 250:01\*315:01, 825:01\*268:01 |
| **72** | 145 bp175 bp250 bp | \*327:01\*270:01\*267:01, 293:01, 662:01, 1017:01 |
| **73** | 170 bp190 bp | \*231:01\*18:01:01:01-18:01:03, 28:01, 139:01, 178:01, 230:01, 279:01:01, 280:01, 292:01, 296:01, 347:01, 431:01, 489:01, 499:01, 512:01, 526:01, 644:01, 752:01, 897:01, 918:01, 942:01 |
| **74** | 115 bp160 bp215 bp | \*181:01, 406:01\*255:01, 274:01, 374:01, 889:01\*252:01, 273:01, 582:01, 624:01, 772:01 |
| **76** | 120 bp180 bp220 bp250 bp | \*215:01\*283:01, 359:01, 423:01:01-423:01:02, 523:01:01, 577:01, 928:01\*193:01, 681:01\*225:01 |
| **77** | 120 bp170 bp220 bp250 bp | \*215:01\*488:01, 557:01\*194:01, 360:01\*311:01, 368:01, 687:01, 696:01N |
| **78** | 145 bp180 bp220 bp250 bp | \*282:01, 1056:01\*318:01, 485:01, 523:01:01, 641:01\*195:01, 424:01, 510:01, 837:01\*224:01, 696:01N |
| **79** | 75 bp115 bp170 bp245 bp170 bp | \*476:01, 751:01\*551:01N\*275:01, 283:01, 359:01, 396:01, 577:01\*212:01, 224:01\*679:01 |
| **80** | 160 bp250 bp | \*213:01:01, 282:01, 286:01, 396:01, 433:01, 488:01, 523:01:02, 557:01, 646:01, 660:01, 682:01, 1056:01\*225:01 |
| **81** | 65 bp95 bp145 bp180 bp205 bp285 bp | \*591:01\*276:01\*250:01\*202:01, 230:01, 313:01\*281:01, 472:01\*268:01, 472:01 |
| **83** | 160 bp215 bp | \*04:01:01:01-04:01:46, 11:01:01:01-11:01:05, 15:01:01:01-15:01:03, 24:01, 27:01, 28:01, 31:01:01:01-31:01:01:02, 33:01:01:01-33:01:01:05, 39:01:01:01-39:01:03, 40:01:01:01-40:01:02, 49:01:01:01-49:01:01:03, 51:01:01:01-51:01:01:02, 53:01, 66:01, 72:01:01:01-72:01:01:03, 74:01, 81:01:01:01-81:01:02, 85:01:01:01-85:01:02, 89:01, 96:01, 99:01, 102:01, 117:01, 120:01N, 121:01, 126:01:01:01-126:01:01:02, 139:01, 147:01, 149:01, 156:01, 158:01, 169:01, 172:01, 174:01, 175:01, 176:01, 177:01, 178:01, 179:01, 180:01, 181:01, 192:01, 193:01, 194:01, 195:01, 198:01, 199:01, 202:01, 204:01, 205:01, 206:01, 207:01, 212:01, 213:01:01-213:01:02, 214:01, 215:01, 224:01, 225:01, 228:01, 229:01, 230:01, 232:01, 240:01, 247:01, 250:01, 253:01, 254:01, 255:01, 262:01, 264:01, 268:01, 272:01, 275:01, 276:01, 277:01, 279:01:01-279:01:02, 280:01, 281:01, 282:01, 283:01, 287:01, 290:01, 294:01, 296:01, 298:01, 299:01, 302:01, 303:01, 305:01, 319:01, 320:01, 323:01, 328:01N, 334:01:01-334:01:02, 335:01, 336:01, 337:01, 341:01, 345:01, 348:01:01-348:01:02, 350:01, 354:01:01-354:01:02, 355:01, 356:01, 357:01N, 360:01, 370:01, 372:01, 375:01, 376:01, 378:01, 387:01, 388:01, 396:01, 397:01, 398:01, 399:01, 415:01, 418:01, 425:01, 426:01, 427:01, 428:01, 434:01, 437:01, 450:01N, 453:01, 454:01, 455:01N, 456:01, 459:01, 464:01, 465:01, 468:01, 471:01, 474:01, 475:01, 476:01, 479:01, 480:01, 482:01, 485:01, 486:01, 487:01, 493:01, 512:01, 517:01, 520:01, 521:01, 522:01, 523:01:01-523:01:02, 524:01, 529:01, 531:01, 534:01, 553:01, 554:01, 555:01, 556:01, 559:01, 561:01, 566:01, 569:01, 574:01, 575:01, 578:01, 583:01, 584:01:01:01-584:01:02:02, 585:01:01:01-585:01:01:02, 591:01, 592:01, 593:01, 607:01, 614:01, 615:01, 618:01, 623:01, 625:01, 633:01, 642:01, 643:01, 644:01, 649:01, 654:01, 658:01, 663:01, 666:01, 670:01, 672:01, 677:01, 679:01, 682:01, 683:01, 686:01, 687:01, 694:01, 696:01N, 699:01, 702:01, 707:01, 713:01, 716:01, 722:01, 732:01N, 736:01, 739:01, 742:01, 743:01N, 745:01, 747:01, 748:01N, 749:01, 750:01, 752:01, 753:01, 754:01N, 755:01, 756:01N, 757:01, 758:01, 761:01, 765:01, 767:01, 768:01, 769:01, 772:01, 773:01, 784:01, 788:01, 795:01, 803:01, 804:01, 806:01:01:01-806:01:01:02, 808:01, 811:01, 812:01, 813:01, 814:01, 820:01, 821:01N, 824:01:01-824:01:02, 826:01, 828:01, 837:01, 838:01N, 840:01, 842:01, 844:01N, 849:01, 850:01, 852:01, 856:01, 859:01, 867:01N, 868:01N, 871:01N, 874:01N, 875:01N, 878:01N, 880:01, 882:01, 895:01, 896:01, 900:01, 901:01, 903:01, 907:01, 910:01, 911:01N, 915:01, 918:01, 921:01, 922:01, 926:01, 930:01, 932:01, 937:01, 939:01, 943:01, 945:01, 957:01, 966:01, 974:01N, 978:01, 980:01, 988:01, 989:01, 992:01, 993:01, 997:01, 1001:01, 1002:01, 1003:01, 1004:01, 1010:01, 1011:01, 1016:01, 1023:01, 1033:01, 1034:01, 1039:01, 1040:01, 1042:01, 1046:01, 1048:01, 1054:01, 1060:01, 1062:01, 1063:01, 1064:01, 1066:01\*169:01 |
| **84** | 200 bp260 bp | \*180:01, 418:01, 432:01, 604:01\*177:01, 186:01, 338:01, 787:01 |
| **85** | 110 bp190 bp260 bp285 bp | \*572:01, 923:01, 1021:01\*175:01, 419:01, 429:01, 498:01\*171:01\*08:01?, 60:01?, 62:01?, 73:01?, 75:01?, 102:01?, 237:01, 585:01:01:01-585:01:01:02,722:01 |
| **86** | 125 bp170 bp195 bp220 bp | \*190:01, 796:01\*485:01\*354:01:01-354:01:02, 375:01, 480:01, 531:01, 663:01, 693:01N, 1039:01\*360:01, 520:01 |
| **87** | 145 bp230 bp | \*327:01, 619:01, 698:01, 815:01\*329:01, 587:01, 929:01 |
| **90** | 80 bp125 bp215 bp | \*571:01\*700:01N\*415:01, 534:01 |
| **91** | 155 bp220 bp | \*464:01, 535:01, 617:01, 699:01\*534:01 |
| **92** | 115 bp165 bp195 bp230 bp | \*403:01N\*445:01\*691:01N\*533:01 |
| **93** | 185 bp225 bp255 bp | \*634:01\*404:01, 598:01N, 661:01N\*450:01N |
| **94** | 160 bp190 bp240 bp270 bp | \*01:01:01:01-01:01:04, 01:01:06, 26:01:01-26:01:03, 56:01, 65:01:01-65:01:02, 76:01, 90:01:01-90:01:02, 92:01, 118:01, 122:01, 125:01, 127:01, 142:01, 150:01, 159:01N, 162:01:01-162:01:02, 203:01:01-203:01:02, 220:01, 267:01, 288:01, 291:01, 306:01, 315:01, 326:01, 327:01, 346:01, 363:01, 377:01, 385:01, 403:01N, 411:01, 417:01:01-417:01:02, 436:01, 440:01, 442:01, 462:01, 470:01, 481:01, 483:01, 490:01, 499:01, 514:01, 516:01, 536:01, 542:01, 543:01, 562:01, 609:01, 616:01, 626:01, 631:01, 632:01, 636:01, 661:01N, 667:01, 708:01, 709:01, 710:01, 711:01, 733:01, 800:01N, 807:01, 810:01, 825:01, 853:01, 862:01N, 866:01N, 870:01N, 879:01:01:01-879:01:01:03, 904:01, 916:01, 931:01, 953:01, 960:01N, 969:01, 976:01, 979:01, 984:01N, 998:01, 999:01, 1012:01 1024:01, 1038:01Q, 1050:01, 1068:01\*454:01, 486:01\*08:01, 57:01, 65:01:01-65:01:02, 68:01, 73:01, 75:01, 84:01, 150:01, 188:01, 234:01, 285:01, 306:01, 377:01, 442:01, 499:01, 620:01, 626:01, 648:01:01:01-648:01:01:02, 904:01, 916:01, 976:01\*454:01, 486:01, 775:01 |
| **95** | 140 bp220 bp | \*13:01:01:01-13:01:03, 107:01, 117:01, 133:01, 160:01, 172:01, 173:01, 198:01w, 206:01, 246:01, 247:01, 269:01, 287:01, 362:01, 389:01w, 393:01, 438:01, 441:01, 449:01, 474:01, 503:01, 514:01, 518:01, 519:01, 544:01, 561:01, 564:01, 565:01, 597:01, 600:01, 609:01, 612:01, 631:01, 633:01, 634:01, 663:01w, 703:01, 711:01, 716:01, 822:01, 873:01N, 888:01, 893:01, 924:01, 947:01, 991:01, 996:01, 1008:01, 1045:01N, 1057:01, 1065:01\*06:01:01:01-06:01:05, 13:01:01:01-13:01:03, 21:01, 29:01, 37:01, 44:01, 88:01, 93:01, 107:01, 109:01, 110:01, 117:01, 133:01, 160:01, 161:01N, 198:01, 200:01, 206:01, 208:01, 246:01, 247:01, 249:01, 269:01, 295:01, 347:01, 349:01, 362:01, 371:01, 389:01, 393:01, 413:01, 438:01, 448:01, 449:01, 518:01, 519:01, 544:01, 546:01, 550:01, 561:01, 563:01, 564:01, 565:01, 566:01, 567:01, 597:01, 600:01, 601:01, 608:01, 609:01, 612:01, 631:01, 633:01, 634:01, 662:01, 663:01, 703:01, 711:01, 717:01, 737:01, 746:01, 822:01, 873:01N, 888:01, 893:01, 906:01, 909:01, 914:01, 920:01, 924:01, 947:01, 991:01, 996:01, 1006:01, 1008:01, 1019:01, 1022:01, 1045:01N, 1047:01, 1057:01, 1065:01 |

**4**The following DPB1 alleles can be distinguished by the different sizes of the HLA-specific PCR product:

|  |  |  |  |
| --- | --- | --- | --- |
| Alleles | Primer mix | Alleles | Primer mix |
| DPB1\*32:01, 339:01 | 42 | DPB1\*237:01, 419:01 | 85 |
| DPB1\*120:01N, 453:01, 521:01 | 44 | DPB1\*250:01, 268:01 | 71, 81 |
| DPB1\*149:01, 840:01 | 49 | DPB1\*281:01, 591:01 | 81 |
| DPB1\*153:01, 321:01, 595:01 | 53 | DPB1\*498:01, 572:01 | 85 |

Abbreviations

w: might be weakly amplified.

?: nucleotide sequence information not available for the primer matching sequence.

Changes in revision R01 compared to R00:

1. Primer mix 45 does not amplify the DPB1\*115:01 and 962:01 alleles.

2. Primer mix 55 does not amplify the DPB1\*115:01, 393:01, 962:01 and 1007:01 alleles.

3. Primer mix 72 does not amplify the DPB1\*393:01 and 1007:01 alleles.

The corrections above have been implemented in the Specificity and Interpretation tables.

Changes in revision R02 compared to R01:

1. In primer mix 48 the specific PCR product of 280 base pairs may give rise to a lower yield of HLA-specific PCR product than the other DPB1 primer mixes. Optimized gel electrophoresis run time may need to be considered to ensure separation from the control band.