amino acid arginine and may therefore affect antigen-presenting properties of the HLA molecule.

The nucleotide sequence of the novel allele was submitted to GenBank and IPD-IMGT/HLA Databases and the accession numbers OP559474 and HWS10064273 were assigned. The name *C*15:255* has been officially assigned by the WHO Nomenclature Committee for Factors of the HLA System in December 2022. This follows the agreed policy that, subject to the conditions stated in the most recent Nomenclature Report,[2] names will be assigned to new sequences as they are identified. Lists of such new names will be published in the following WHO Nomenclature Report.

AUTHOR CONTRIBUTIONS

Mirzokhid Rakhmanov, Martin Bernheiden, and Murielle Verboom carried out NGS data acquisition, analyzed and interpreted the NGS data. Murielle Verboom performed Sanger sequencing. Florian Emmerich and Mirzokhid Rakhmanov analyzed data and submitted the allele sequence to GenBank. Mirzokhid Rakhmanov and Florian Emmerich wrote the manuscript. All authors have read and approved the final manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Characterization of the novel *HLA-DRB1*01:140* allele by sequencing-based typing

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*HLA-DRB1*01:140* differs from *HLA-DRB1*01:02:01:01* by one nucleotide substitution in codon 147 in exon 3.

KEYWORDS

HLA, *HLA-DRB1*01:140*, novel allele, sequencing-based typing

We report here a novel HLA-DRB1 allele, now named *HLA-DRB1*01:140*, that carries one nucleotide substitution in exon 3 when compared to the *HLA-DRB1*01:02:01:01* allele, identified in a patient awaiting kidney transplantation. The HLA typing was performed using Next Generation Sequencing (AllType NGS, One Lambda, Canoga Park, CA)

```
AA Codon                        100               105               110               115
DRB1*01:02:01:01    TT GAG CCT AAG GTG ACT GTG TAT CCT TCA AAG ACC CAG CCC CTG CAG CAC CAC AAC CTC CTG GTC TGC TCT GTG
DRB1*01:140         -- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

AA Codon          120               125               130               135               140
DRB1*01:02:01:01  AGT GGT TTC TAT CCA GGC AGC ATT GAA GTC AGG TGG TTC CGG AAC GGC CAG GAA GAG AAG GCT GGG GTG GTG TCC
DRB1*01:140       --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

AA Codon          145               150               155               160               165
DRB1*01:02:01:01  ACA GGC CTG ATC CAG AAT GGA GAT TGG ACC TTC CAG ACC CTG GTG ATG CTG GAA ACA GTT CCT CGG AGT GGA GAG
DRB1*01:140       --- --- G-- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

AA Codon          170               175               180               185
DRB1*01:02:01:01  GTT TAC ACC TGC CAA GTG GAG CAC CCA AGT GTG ACG AGC CCT CTC ACA GTG GAA TGG A
DRB1*01:140       --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- -
```

FIGURE 1 Alignment of the sequence of exon 3 of *HLA-DRB1*01:140* allele with the sequence of *HLA-DRB1*01:02:01:01*. Dashes indicate nucleotide identity with the *HLA-DRB1*01:02:01:01* allele. Numbers above the sequence indicate codon position.

on the Ion S5 system platform (ThermoFisher Scientific, Waltham, MA),[1] from exons 2 to 6. The reads were analyzed using the TypeStream Visual Software version 2.1 (One Lambda). This patient was found to have a new *DRB1*01* allele and was consequently typed *A*01:01, 29:02*; *B*18:01, 37:01*; *C*05:01*, *06:02*; *DRB1*01:140, 07:01*; *DRB4*01:01*; *DQA1*01:01*, *02:01*; *DQB1*02:02*, *05:01P*; *DPA1*01:03*, *02:12*; *DPB1*15:01*, *85:01*. Using the IPD-IMGT/HLA Database,[2] nucleotide sequence alignment with HLA-DRB1 alleles shows that this new allele has one nucleotide change from *DRB1*01:02:01:01* in codon 147 in exon 3, where C → G resulting in a new protein (CTG → GTG, Leucine → Valine, Figure 1). This nucleotide change was confirmed using other NGS reagents provided by GenDX NGSgo-MX6-1 (Utrecht, Netherlands) run on the Illumina MiSeq system (San Diego, CA) and analyzed with the NGSEngine software (GenDX, version 2.26). We were very confident in the phasing as the sample displayed a mean read length of 303 base pairs over all the loci, the mismatched G base was attributed 988 times to the new *HLA-DRB1*01* allele and can be only attributed to this allele because it was possible to discriminate from the associated *HLA-DRB1*07:01:01:01* allele by virtue of 2 variant positions each distant by less than 100 base pairs. HLA typing by Luminex reverse sequence-specific oligonucleotide (SSO) was performed (One Lambda Labtype, Canoga Park, CA).[3] With this assay (lot 006, catalog RSSOX2B1_006_03), the most likely HLA-typing of the donor was *DRB1*01:DWJJD*, *07:DVYJB* (most likely allele *DRB1*01:02*, *07:01*, respectively) without any bead modification. Indeed the IPD-IMGT/HLA Database 3.50.0 release describe few other HLA-DRB1 alleles displaying a GTG sequence in codon 147, explaining why the manufacturer did not include probes targeting this codon. The analysis of the localization of this amino-acid and its antibody accessibility with the pHLA3D database[4] indicated that this amino-acid is located out of the peptide binding groove while it is surface accessible. Then, despite the fact that Leucine and Valine are amino-acids having similar physico-chemical properties, a transplanted organ from a donor expressing the *HLA-DRB1*01:140* allele could lead to a humoral allo-sensitization which cannot be detected by current solid-phase assays. In case of a suspicious antibody-mediated rejection, only the use of donor's cells to perform a retrospective crossmatch could allow the diagnosis. The nucleotide sequence of the new allele has been submitted to the GenBank database (Accession No. OP807952) and to the IPD-IMGT/HLA Database (Submission No. HWS10064315). The name *DRB1*01:140* has been officially assigned by the WHO Nomenclature Committee for Factors of the HLA System in November 2022. This follows the agreed policy that, subject to the conditions stated in the most recent Nomenclature Report,[5] names will be assigned to new sequences as they are identified. Lists of such new names will be published in the following WHO Nomenclature Report.

AUTHOR CONTRIBUTIONS

Marine Cargou and Jonathan Visentin contributed to the design of the study. Marine Cargou and Jonathan Visentin participated in the writing of the paper. Marine Cargou, Vincent Elsermans, Isabelle Top, Gwendaline Guidicelli, and Jonathan Visentin participated in the performance of the research. Marine Cargou, Vincent Elsermans, Isabelle Top, Gwendaline Guidicelli, and Jonathan Visentin participated in data analysis. Vincent Elsermans, Isabelle Top, and Gwendaline Guidicelli were involved in critical revision of the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors confirm that there are no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions. The sequence is freely available in the IPD-IMGT/HLA Database.

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Characterization of the novel HLA-DRB1 allele, *HLA-DRB1*04:328* in a Chinese individual

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*HLA-DRB1*04:328* shows a single nucleotide substitution at position 143 A>T when compared with *HLA-DRB1*04:05:01:01*.

KEYWORDS
*HLA-DRB1*04:328*, new allele, next-generation sequencing

There are 35,820 HLA alleles identified in populations around the world according to the latest release of the IPD-IMGT/HLA Database (Version 3.51.0 January 2023), including 4374 alleles for the HLA-DRB1 locus.[1] Here, we describe the novel HLA-DRB1 allele, officially named as *HLA-DRB1*04:328*, that has been found in a Chinese cord blood donor.

The sample of the proband was originally genotyped for the HLA-A, -B, -C, -DRB1, -DQB1 loci using the AllType™ NGS 11-loci amplification kit (One Lambda,