Report 2020-2021 - IUIS Nomenclature Committee (NOM)

Immunoglobulins (IG), T cell Receptors (TR) and Major Histocompatibility (MH) Nomenclature Sub-Committee

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https://iuis.org/committees/nom/immunoglobulins-ig-t-cell-receptors-tr-and-major-histocompatibility-mh-nomenclature-sub-committee/

1. Objectives

The IMGT Nomenclature Committee (IMGT-NC) was created in 1989 by Marie-Paule Lefranc at the Tenth International Human Gene Mapping (HGM10) Workshop (June 10-17, 1989, New Haven, Connecticut, USA) for the standardized classification and nomenclature of the immunoglobulins (IG) and T cell receptors (TR) of human and other vertebrate species [1-5]

In 1992, IMGT-NC became the first WHO-IUIS Nomenclature Sub-Committee for immunoglobulins and T cell receptors, founded by Donald Capra (USA), Hans Georg Zachau (Germany), Max Cooper (USA), Tasuku Honjo (Japan), Leroy Hood (USA), Fumihiko Matsuda (Japan), Gérard Lefranc (France) and Marie-Paule Lefranc, Chair (France) [6-7]. Since 2012, the IUIS Nomenclature Committee (NOM) Sub-Committee is designated as 'Immunoglobulins (IG), T cell Receptors (TR) and Major Histocompatibility (MH) Nomenclature Sub-Committee' (IMGT-NC).

2. Mission

The mission of IUIS NOM IMGT-NC is to promote a unique nomenclature of the immunoglobulins (IG), T cell receptors (TR) and major histocompatibility (MH) genes and proteins of humans and other vertebrate species, based on the IMGT Scientific chart [1-7].

The genes and alleles validated by the Sub-Committee are managed by IMGT®, the international ImMunoGeneTics information system® http://www.imgt.org, created in 1989 by Marie-Paule Lefranc, and the global reference in immunogenetics and immunoinformatics.

3. Members

Founding and Life-time Members of the WHO-IUIS Nomenclature Committee (NOM) Immunoglobulins (IG), T cell receptors (TR) and major histocompatibility (MH) Nomenclature Sub-Committee are J. (Joseph) Donald Capra (USA) (1937-2015) (www.jimmunol.org/content/194/12/5575.full), Max Cooper (USA), Tasuku Honjo (Japan), Leroy Hood (USA), Gérard Lefranc (France), Marie-Paule Lefranc IMGT-NC Founder and Chair (France), Fumihiko Matsuda Deputy-chair (Japan) and Hans Georg Zachau (Germany) (1930-2017).

IMGT Experts are scientists in the field of immunogenetics who in their published work have promoted standardization of the IMGT IG, TR and/or MH genes and alleles and who contribute,

on a case by case basis, as anonymous reviewers of submitted data for IMGT-NC validation of IG, TR and/or MH loci of given species.

4. Annual reports

Summary reports, written by the IUIS NOM IMGT-NC Chair, have been sent on an annual basis to the chair of the WHO-IUIS Nomenclature Committee since 1992 (Michel Kazatchkine (Sept 1992-2004), Laurence Boumsell (Sept 2004-2010), Pablo Engel (Sept 2010-2016), Menno van Zelm (Sept 2016-)), for presentation at the annual IUIS Council Meetings (coincident every three years with the International Congress of Immunology (ICI). They are publicly available on the IUIS web site. https://iuis.org/committees/nom/immunoglobulins-ig-t-cell-receptors-tr-and-major-histocompatibility-mh-nomenclature-sub-committee/

5. Highlight

The publication in Frontiers in Immunology, invited by the WHO IUIS Nomenclature Committee (Proceedings of ICI Milan 2013)
Lefranc M-P. Immunoglobulin (IG) and T cell receptor genes (TR): IMGT® and the birth and rise of immunoinformatics. Front Immunol. 2014 Feb 05;5:22.
https://www.frontiersin.org/articles/10.3389/fimmu.2014.00022/full
has reached a total of 21,755 views on October 24, 2021.

6. Focus 2020-2021: IUIS NOM IMGT-NC Reports

The focus 2020-2021 has been the IUIS NOM IMGT-NC Reports with the formalization of the submission procedure, including documents required for the analysis of new IG and TR genes and alleles by experts and validation by the IUIS NOM IMGT-NC and with the publication of the IMGT-NC reports on the IUIS web site (https://iuis.org/committees/nom/immunoglobulins-ig-t-cell-receptors-tr-and-major-histocompatibility-mh-nomenclature-sub-committee/).

6.1. IUIS NOM IMGT-NC Reports initiative

IMGT-NC Reports is an initiative of the IUIS Nomenclature Sub-Committee for immunoglobulins (IG), T cell receptors (TR) and major histocompatibility (MH) (IUIS NOM IMGT-NC), allowing scientists to submit IMGT names for new IG and TR variable (V), diversity (D), joining (J) and constant (C) genes and alleles to the IUIS Sub-Committee for approval.
The IMGT names are based on the IMGT Scientific chart rules generated from the IMGT-ONTOLOGY axioms and concepts, and in particular, the concepts of classification (CLASSIFICATION axiom) [1-7].

6.2. Contacts for submissions

Prof Marie-Paule Lefranc
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and Prof Fumihiko Matsuda
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6.3. Prerequisite for submissions

An accession number in a generalist database is required for each submitted gene or allele sequence.

6.4. Submission of new genes and alleles (V, D, J, C)

Submission of new V genes and alleles

The submission of new V genes and alleles requires:

- a genomic germline sequence (germline gDNA)
- a complete sequence from the atg (INIT-CODON) of L-PART1 to the V-RS included: L-V-GENE-UNIT (*http://www.imgt.org/IMGTScientificChart/SequenceDescription/displayimage.php?id=19*)
- a mapped sequence (cloned from BAC, cosmid or phage or extracted from a referenced genome assembly.

Sequences from NGS are accepted only for known alleles if they complete the germline genomic sequence in 5' or in 3' (a few alleles may have incomplete sequences in 5' or 3' if they were retrieved from the literature).

☞ Submission of inferred V alleles from NGS:

1) If a new V allele is suspected by NGS, its sequence needs to be confirmed from a direct Sanger sequencing from the germline gDNA from the individual, or to be mapped (cloned from BAC, cosmid or phage or extracted from a referenced genome assembly) for a direct submission to IUIS NOM IMGT-NC.

2) Alternatively, if a new V allele is suspected by NGS, its sequence can be submitted to IUIS NOM IMGT-NC via the working group (WG) inferred allele review committee (IARC), within the adaptive immune receptor repertoire (AIRR) community. The IARC WG analyses if the criteria for defining inferred alleles from NGS are fulfilled and if data quality are met.

Both procedure includes a submission of inferred alleles to a generalist database, before submission to IUIS NOM IMGT-NC.

Submission of new D genes and alleles

The submission of new D genes and alleles requires:

- a genomic germline sequence (germline gDNA)
- a complete sequence from the 5'D-RS to the 3'D-RS included: D-GENE-UNIT (*http://www.imgt.org/IMGTScientificChart/SequenceDescription/displayimage.php?id=2*)
- a mapped sequence (cloned from BAC, cosmid, phage or extracted from a referenced genome assembly.

Submission of new J genes and alleles

The submission of new J genes and alleles requires:

- a genomic germline sequence (germline gDNA)
- a complete sequence from the J-RS to the DONOR-SPLICE included: J-GENE-UNIT plus DONOR-SPLICE (*http://www.imgt.org/IMGTScientificChart/SequenceDescription/displayimage.php?id=9*)
- a mapped sequence (cloned from BAC, cosmid, phage or extracted from a referenced genome assembly.

Submission of new C genes and alleles

The submission of new C genes and alleles requires:

- a genomic sequence (gDNA)
- a complete sequence from the first codon of the first exon (EX1) to the STOP-CODON included (this requirement has become effective from January 1, 2018): C-GENE-UNIT (*http://www.imgt.org/IMGTScientificChart/SequenceDescription/displayimage.php?id=6*)
- a mapped sequence (cloned from BAC, cosmid, phage or extracted from a referenced genome assembly).

6.5. Analysis, validation and publication

At the submission reception, the Chair and Deputy Chair designate experts for analysis of the submitted data and the preparation of the IMGT-NC Reports.

The IUIS NOM IMGT-NC reports are published online on the IUIS NOM Sub-Committee for the IG, TR and MH page (*https://iuis.org/committees/nom/immunoglobulins-ig-t-cell-receptors-tr-and-major-histocompatibility-mh-nomenclature-sub-committee/*) of the IUIS web site. They officially validate the IMGT gene and allele names for use by the scientific community.

6.6. Biocuration

Following publication of an IMGT-NC report, the approved IMGT genes and alleles are forwarded to the IMGT team biocurators for annotation of the genes and alleles in IMGT®, the international ImMunoGeneTics information system® (*http://www.imgt.org*) [1]. Following IMGT biocuration, annotated IG and TR genes and alleles are published in IMGT® Creations and updates (*http://www.imgt.org/IMGTinformation/creations/*), with reference to the IUIS IMGT-NC report.

7. References

[1] Lefranc M-P. Immunoglobulin (IG) and T cell receptor genes (TR): IMGT® and the birth and rise of immunoinformatics. Front Immunol. 2014 Feb 05;5:22 (2014). doi: 10.3389/fimmu.2014.00022. Open access. PMID: 24600447

[2] Lefranc, M.-P. Nomenclature of the human immunoglobulin genes. In: Current Protocols in Immunology (J. E. Coligan, B.E. Bierer, D.E. Margulies, E.M. Shevach and W. Strober, eds.), John Wiley and Sons, Hoboken N.J., pp. A.1P.1-A.1P.37 (2000).PMID: 18432650

[3] Lefranc, M.-P. Nomenclature of the human T cell receptor genes. In: Current Protocols in Immunology (J. E. Coligan, B.E. Bierer, D.E. Margulies, E.M. Shevach and W. Strober, eds.), John Wiley and Sons, Hoboken N.J., pp. A.1O.1-A.1O.23 (2000).PMID: 18432649

[4] Lefranc, M.-P. and Lefranc, G., The Immunoglobulin FactsBook, Academic Press, 458 pages (2001) ISBN: 012441351X

[5] Lefranc, M.-P. and Lefranc, G., The T cell receptor FactsBook, Academic Press, 398 pages (2001) ISBN: 0124413528

[6] Lefranc, M-P. WHO-IUIS Nomenclature Subcommittee for immunoglobulins and T cell receptors report August 2007, 13th International Congress of Immunology, Rio de Janeiro, Brazil. Dev. Comp. Immunol., 32(5):461-463 (2008) doi: 10.1016/j.dci.2007.09.008. Epub 2007 Nov 6. PMID: 18036660

[7] Lefranc, M-P. WHO-IUIS Nomenclature Subcommittee for immunoglobulins and T cell receptors report, Immunogenetics, 59(12):899-902 (2007) doi: 10.1007/s00251-007-0260-4. Epub 2007 Nov 29. PMID: 18046549

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