

**The molecular phenotype of kidney transplants:  
Insights from the MMDx project**

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SUPPLEMENTAL DIGITAL CONTENT

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<b>Table S1.</b> List of abbreviations and their definitions used in the manuscript	
<b>Abbreviation</b>	<b>Definition</b>
AA	Archetypal analysis
AMR	Antibody-mediated rejection
ADCC	Antibody-dependent cell-mediated cytotoxicity
AKI	Acute kidney injury
AKI1	AA Group: Acute kidney injury 1
AKI2	AA Group: Acute kidney injury 2
AMR <sub>Prob</sub>	AMR classifier (AMR, [C4d-negative and C4d-positive] vs. everything else)
AMR-RAT	AMR – rejection-associated transcripts
AMAT	Alternative macrophage activation transcripts
BAT	B cell-associated transcripts
PVN	Polyoma virus nephropathy
CAT	Cytotoxic T cell-associated transcripts
C4d	Complement factor d
cg>0 <sub>Prob</sub>	Glomerular double contours probability classifier
CKD	Chronic kidney disease
CNI	Calcineurin inhibitor
dd-cfDNA	Donor-derived cell-free DNA
DEKAF	Deterioration of kidney allograft function
DSA	Donor-specific HLA antibody
DSA <sub>Prob</sub>	DSA Probability classifier
DSASTs	DSA-specific transcripts
EAMR	Early-stage AMR
eGFR	Estimated glomerular filtration rate
FAMR	Fully-developed AMR
g>1 <sub>Prob</sub>	Glomerulitis classifier
GFR	Glomerular filtration rate
GRITs	Interferon gamma-inducible transcripts
HLA	Human leukocyte antigen
i>1 <sub>Prob</sub>	Interstitial infiltrate classifier
IFNG	Interferon gamma
IgG	Immunoglobulin G
IGT	Immunoglobulin transcripts
IFTA	Interstitial fibrosis and tubular atrophy
i-IFTA	Interstitial fibrosis and tubular atrophy in areas of inflammation
INTERCOMEX	Diagnostic and Therapeutic Applications of Microarrays in Organ Transplantation (ClinicalTrials.gov Identifier: NCT01299168)
IRRATs	Injury-repair response-associated transcripts
IRIT	Injury-repair induced transcripts
IRITD3	Injury-repair induced transcripts – day 3
IRITD5	Injury-repair induced transcripts – day 5
ITAM	Immunoreceptor tyrosine-based activation motif
EABMR	Early-stage mABMR
FABMR	Fully-developed mABMR
FDR	False discovery rate
FICOL	Fibrillar collagen transcripts
KT	Kidney transcripts
KT1	Kidney transcripts – set 1
KT2	Kidney transcripts – set 2
LAMR	Late-stage mAMR
lowGFR <sub>Prob</sub>	Low GFR probability classifier

MCATs	Mast cell transcripts
MHC	Major histocompatibility complex
MMDx	Molecular Microscope <sup>®</sup> Diagnostic System
mRNA	Messenger RNA
NFAT	Nuclear factor of activated T cells
NK	Natural killer
NKB	NK cell burden transcripts
NR	No rejection
PC1	Principal component 1
PC2	Principal component 2
PC3	Principal component 3
PC	Principal component
PCA	Principal component analysis
PRA	Panel reactive antibody
Prot <sub>Prob</sub>	Proteinuria probability classifier
ptc>1 <sub>Prob</sub>	Peritubular capillaritis classifier
PBT	Pathogenesis-based transcript set
QCATs	Cytotoxic T cell-associated transcripts
QCMAT	Constitutive macrophage-associated transcripts
RATs	Rejection-associated transcripts
RNA	Ribonucleic acid
RTPCR	Real-time polymerase chain reaction
t>1 <sub>Prob</sub>	Tubulitis classifier
TCMR	T cell-mediated rejection
TCMR1	AA Group: T cell-mediated rejection 1
TCMR2	AA Group: T cell-mediated rejection 2
TCMR <sub>Prob</sub>	TCMR classifier (TCMR vs. everything else)
TG	Transplant glomerulopathy
TNF	Tumor necrosis factor
TxBx	Time of biopsy posttransplant

**Table S2.** Participating Centers in INTERCOMEX and Trifecta-Kidney

<b>INTERCOMEX</b>		
<b>Center</b>	<b>Location</b>	<b>Principal investigators</b>
University of Alabama at Birmingham	Birmingham, AL, USA	Roslyn Mannon
Val d'Hebron University Hospital	Barcelona, Spain	Daniel Serón and Joana Sellarés
Montefiore Medical Center	Bronx, NY, USA	Enver Akalin
Manchester Royal Infirmary	Manchester, UK	Declan de Freitas and Michael Picton
University of Maryland	Baltimore, MD, USA	Jonathan Bromberg and Matt Weir
Charite-Medical University of Berlin	Berlin, Germany	Klemens Budde and Timm Heinbokel
Medical University of Hannover	Hannover, Germany	Gunilla Einecke
PinnacleHealth Transplant Associates	Harrisburg, PA, USA	Harold Yang and Seth Narins
Henry Ford Hospital	Detroit, MI, USA	Milagros Samaniego-Picota
Necker Hospital & St. Louis Hospital	Paris, France	Carmen Lefaucheur, Alexandre Loupy
Pomeranian Medical University	Poland	Marek Myslak and Agnieszka Perkowska-Ptasinska
Methodist Transplant and Specialty Hospital	San Antonio, TX, USA	Adam Bingaman
Washington University at St. Louis	St Louis, MO, USA	Daniel Brennan and Andrew Malone
Hennepin County Medical Centre	Minneapolis, MN, USA	Bertram Kasiske
University of Alberta	Edmonton, AB, CA	Philip F Halloran
University on Minnesota	Minneapolis, MN, USA	Arthur Matas
University of Wisconsin	Madison, WI, USA	Arjang Djamali
Medical University of Vienna	Vienna, Austria	Georg Böhmig and Farsad Eskandary
Virginia Commonwealth University	Richmond, VA, USA	Gaurav Gupta
<b>Trifecta-Kidney</b>		
<b>Center</b>	<b>Location</b>	<b>Principal investigators</b>
Medical University in Białystok	Białystok, Poland	Beata Naumnik, Justyna Fryc
University of Maryland School of Medicine	Baltimore, MD, USA	Jonathan Bromberg, Matt Weir, Nadiesda Costa
Johns Hopkins University School of Medicine	Baltimore, MD, USA	Daniel Brennan, Sam Kant, Vignesh Viswanathan, Ashish Solanki
Charite-Medical University of Berlin	Berlin, Germany	Klemens Budde
University Hospitals: Cleveland Medical Center	Cleveland, OH, USA	Jittirat Arksarapuk
The Cleveland Clinic		Emilio Poggio, Richard Fatica, Ziad Zaky
The Children's Memorial Health Institute	Warsaw, Poland	Ryszard Grenda
Henry Ford Transplant Institute	Detroit, MI, USA	Milagros Samaniego-Picota, Iman Francis, Anita Patel
Medical University of Gdańsk	Gdańsk, Poland	Alicja Dębska-Ślizień, Joanna Konopa, Andrzej Chamienia
Medical University of Silesia	Katowice, Poland	Andrzej Więcek, Grzegorz Piecha
University of Ljubljana	Ljubljana, Slovenia	Željka Veceric-Haler, Miha Arnol, Nika Kojc
Wojewodzki Hospital	Poznan, Poland	Maciej Glyda, Katarzyna Smykal-Jankowiak

<b>Institute for Clinical and Experimental Medicine (IKEM)</b>	<b>Prague, Czech Republic</b>	Ondrej Viklicky, Petra Hrubá, Silvie Rajnochová Bloudíčková, Janka Slatinská
<b>Centre of Nephrology, Vilnius University Hospital Santaros Klinikos</b>	<b>Vilnius, Lithuania</b>	Marius Miglinas
<b>Pomeranian Medical University</b>	<b>Szczecin, Poland</b>	Marek Myślak, Joanna Mazurkiewicz, Marta Gryczman
<b>University Hospital n.2, Szczecin</b>		Leszek Domański
<b>Tampa General Hospital</b>	<b>Tampa Bay, FL, USA</b>	Mahmoud Kamel
<b>Warsaw Medical University</b>	<b>Warsaw, Poland</b>	Agnieszka Perkowska-Ptasińska, Dominika Dęborska-Materkowska, Michał Cizek, Magdalena Durlik, Leszek Pączek
<b>Medical University of Wrocław</b>	<b>Wrocław, Poland</b>	Mirosław Banasik
<b>University Hospital Merkur</b>	<b>Zagreb, Croatia</b>	Ksenija Vucur, Zeljka Jurekovic
<b>University Hospital Zurich</b>	<b>Zurich, Switzerland</b>	Thomas Müller, Thomas Schachtner
<b>Washington University at St. Louis</b>	<b>St. Louis, MO, USA</b>	Andrew Malone, Tarek Alhamad
<b>The Royal Melbourne Hospital</b>	<b>Melbourne, Australia</b>	Kevin Chow, Peter Hughes
<b>Intermountain Healthcare</b>	<b>Salt Lake City, UT, USA</b>	Sanjiv Anand
<b>Virginia Commonwealth University</b>	<b>Richmond, VA, USA</b>	Gaurav Gupta, Layla Kamal, Dhiren Kumar, Irfan Moinuddin, Sindhura Bobba
<b>University of Alberta</b>	<b>Edmonton, AB, Canada</b>	Soroush Shojai, Sita Gourishankar, Majid Sikosana
<b>St. Paul's Hospital</b>	<b>Vancouver, BC</b>	John Gill, Jagbir Gill