Target	Clone	Metal	Incub. Time	Temp	Dilution	Company
Keratin	AE1/AE3	106Pd	5h	RT	50	Biolegend
Keratin	C11	106Pd	Overnight	4C	50	cst
HLA-DR	TAL 1B5	141 Pr	5h	RT	100	thermo
CD20	H1	142 Nd	Overnight	4C	100	BD bioscience
CD68	D4B9C	143 Nd	Overnight	4C	100	cst
CD11b	D6X1N	144 Nd	5h	RT	100	cst
CD4	EPR6855	145 Nd	Indirect	4C	50	Abcam
CD8a	D8A8Y	146 Nd	5h	RT	50	cst
CD31	89C2	147 Sm	Overnight	4C	100	cst
CD73	D7F9A	148 Nd	5h	RT	50	cst
Collagen I	EPR7785	149Sm	Overnight	4C	100	abcam
Granzyme B	D6E9W	150 Nd	5h	RT	100	cst
C1q	C1QA/2956	151 Eu	Overnight	RT	50	Abcam
Ki-67	8D5	152 Sm	Overnight	4C	100	cst
CD3	EP449E	153 Eu	Overnight	4C	50	abcam
CD66b	G10F5	154 Sm	Overnight	4C	100	biolegend
CD141	E7Y9P	155 Gd	Overnight	4C	50	cst
CD123	ab268196	156 Gd	Overnight	4C	50	abcam
CD1c	EPR23189-196	157 Gd	Overnight	4C	50	abcam
Vista	D1L2G	158 Gd	5h	RT	100	abcam
FOXP3	D608R	159 Tb	Overnight	4C	50	cst
Tbet	4B10	160 Gd	Overnight	4C	50	abcam
CD16	D1N9L	161 Dy	Overnight	4C	100	cst
IDO	D5J4E(TM)	162 Dy	Overnight	4C	100	cst
CD14	D7A2T	163 Dy	5h	RT	100	cst
CD204	J5HTR3	164 Dy	5h	RT	50	Thermo
CD45RO	UCHL1	165 Ho	Overnight	4C	100	cst
D2-40	D2-40	166 Er	Overnight	4C	100	biolegend
CD56	E7X9M	167 Er	5h	RT	100	cst
CD103	EPR4166(2)	168 Er	5h	RT	50	abcam
CD38	EPR4106	169 Tm	Overnight	4C	100	abcam
CD45RA	HI100	170 Er	5h	RT	100	abcam
CD15	BRA-4F1	171 Yb	Overnight	4C	100	abcam
CD1a	EP3622	172 Yb	Overnight	4C	100	Thermo
CD163	EPR14643-36	173 Yb	5h	RT	50	abcam
CD7	EPR4242	174 Yb	5h	RT	100	abcam
CD45	D9M8I	175 Lu	5h	RT	50	cst
CD11c	EP1347Y	176 Yb	5h	RT	100	abcam
Vimentin	D21H3	194 Pt	Overnight	4C	50	cst
HLA-G	MEM-G/2	198 Pt	Overnight	4C	50	exbio
a-SMA	D4K9N	209bi	5h	RT	100	cst
B catenin	D10A8	89Y	Overnight	4C	100	cst

Table S1. **Antibodies used in IMC.**

TRITON	1012 Glomerulitis^{-} 24w Protocol	1016 Glomerulitis^{-} 24w Protocol	1055 Glomerulitis^{-} 24w Protocol	1057 Glomerulitis^{-} 24w Protocol	1068 Glomerulitis^{-} 24w Protocol	1003 Glomerulitis^{+} 24w Protocol	1004 Glomerulitis^{+} 24w Protocol	1005 Glomerulitis^{+} 5y Indication	1006 Glomerulitis^{+} 24w Protocol	1065 Glomerulitis^{+} 24w Protocol	1013 Glomerulitis^{+} 24w Protocol	*GLT1* Glomerulitis^{+} Indication	*GLT2* Glomerulitis^{+} Indication	*GLT3* Glomerulitis^{+} Indication	*GLT4* Glomerulitis^{+} Indication
Number of glomeruli	7	18	66	13	11	17	29	41	30	13	25	49	47	30	25
Number of sclerosed glomeruli	0	0	0	1	1	1	1	3	0	1	0	14	6	0	0
Focale segmentale glomerulosclerose (FSGS)	-	-	-	-	-	+	-	+	-	-	-	NP	NP	NP	NP
Mesangiocapillary glomerulonephritis	-	-	-	-	-	-	-	-	-	-	-	NP	NP	NP	NP
Crescents	-	-	-	-	-	-	-	-	-	-	-	NP	NP	NP	NP
Thrombotic microangiopathy	-	-	-	-	-	-	-	-	-	-	-	NP	NP	NP	NP
Acute tubular necrosis or acute tubular injury	-	-	+	-	-	-	-	-	-	-	-	NP	NP	NP	NP
Glomerulitis (Banff g-score)	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**3**	**3**	**2**	**1**	**2**	**3**	**3**	**2**
Transplant glomerulopathy (Banff cg-score)	0	0	0	0	0	0	0	2	0	0	0	3	3	0	0
Mesangial matrix increase (Banff mm-score)	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0
Interstitial inflammation (Banff i-score)	0	0	0	0	0	3	0	1	1	0	0	1	1	1	2
Tubulitis (Banff t-score)	0	0	0	0	0	2	0	1	1	0	0	2	1	1	2
Total inflammation	0%	0%	0%	0%	0%	60%	10%	20%	10%	10%	0%	>50%	>50%	10-25%	26-50%
Interstitial fibrosis and tubular atrophy	0%	10%	30%	0%	0%	10%	10%	20%	0%	10%	0%	26-50%	26-50%	<10%	<10%
Inflammation in sclerosed areas (Banff i-IFTA-score)	0	0	0	0	1	3	1	3	0	2	0	3	3	0	0
Peritubular capillaritis (Banff ptc-score)	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**0**	**0**	**2**	**3**	**3**	**1**
Arteriitis/endothelialitis (Banff v-score)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vascular intima fibrosis (Banff cv-score)	1	1	0	0	1	0	1	1	1	0	1	2	2	0	2
Arteriolar hyalinosis (Banff ah-score)	0	0	0	0	1	1	2	0	0	3	0	2	2	0	0
C4d staining on biopsy	NP	NP	NP	NP	NP	+	-	+	-	-	-	+	+	+	+
BK staining on biopsy	NP	NP	NP	NP	NP	-	NP	-	NP	NP	NP	NP	NP	NP	NP
CMV staining on biopsy	NP	NP	NP	NP	NP	NP	NP	NP	-	NP	NP	NP	NP	NP	NP
Diagnosis	Normal biopsy or nonspecific changes	IFTA Grade I	IFTA Grade II	Normal biopsy or nonspecific changes	Normal biopsy or nonspecific changes	Active ABMR	Active ABMR / Acute TCMR IA	Chronic Active ABMR / Suspicious (Borderline) for Acute TCMR / IFTA Grade I	Active ABMR	CNI toxicity	Normal biopsy or nonspecific changes	Chronic Active AMR/ Chronic Active TCMR IA	Chronic Active AMR	Active AMR / Suspicious (Borderline) for Acute TCMR	Active AMR / Acute TCMR IA

Table S2. **Banff scores.**

	Age	Sex	MSC/ Control	HLA-A/B/DR mismatch	KIR ligand mismatch	DSA at biopsy timepoint	Virus RT-PCR at biopsy timepoint log c/mL
Glomerulitis^{-}							
1057	48	m	Control	1/0/1	No	No	BK, det. load
1012	63	m	MSC	2/1/2	C2	No	No
1068	64	m	Control		Bw4	No	No
1016	57	v	control	2/1/2	No	No	No
1055	57	m	control	2/2/2	No	No	No
Glomerulitis^{+}							
1003	69	m	MSC	2/2/2	C2	Yes	No
1004	54	v	MSC	2/2/2	No	Yes	No
1005	49	m	Control	2/1/1	No	No	BK= 0
1006	66	m	MSC	0/2/2	Bw4 & C2	Yes	No
1013	53	m	Control	2/2/2	No	No	No
1065	54	v	Control	1/0/0	No	No	BK= 2.6
GLT1	-	-	Indication	-	-	-	-
GLT2	-	-	Indication	-	-	-	-
GLT3	-	-	Indication	-	-	-	-
GTL4	-	-	Indication	-	-	-	-

Table S3. **Clinical parameters of the patients.**

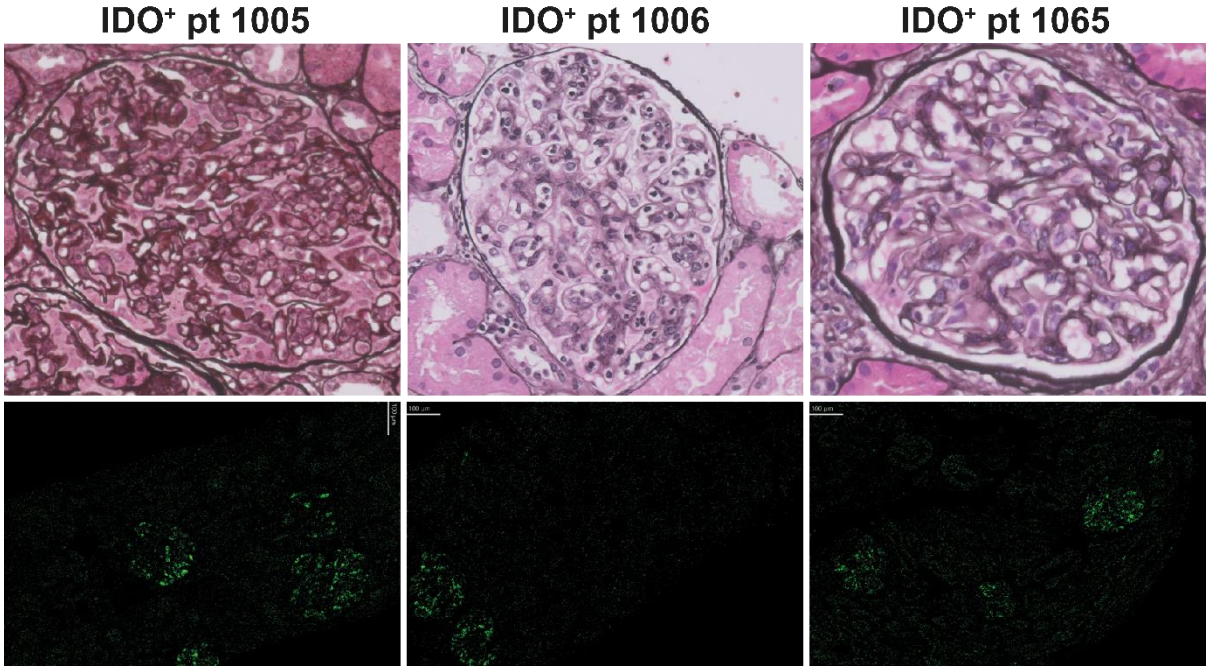
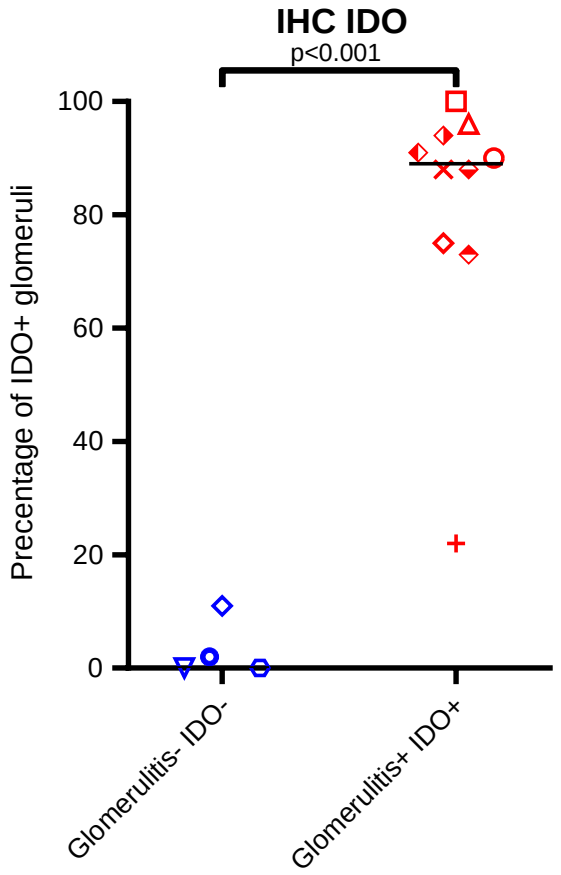


Figure S1. **H&E stains and IDO$^+$ stains of patient 1005, 1006 and 1065.** Top panel shows H&E stains of the three patients with IDO$^+$ glomeruli. Bottom panel shows IDO staining in IMC images of these three patients.



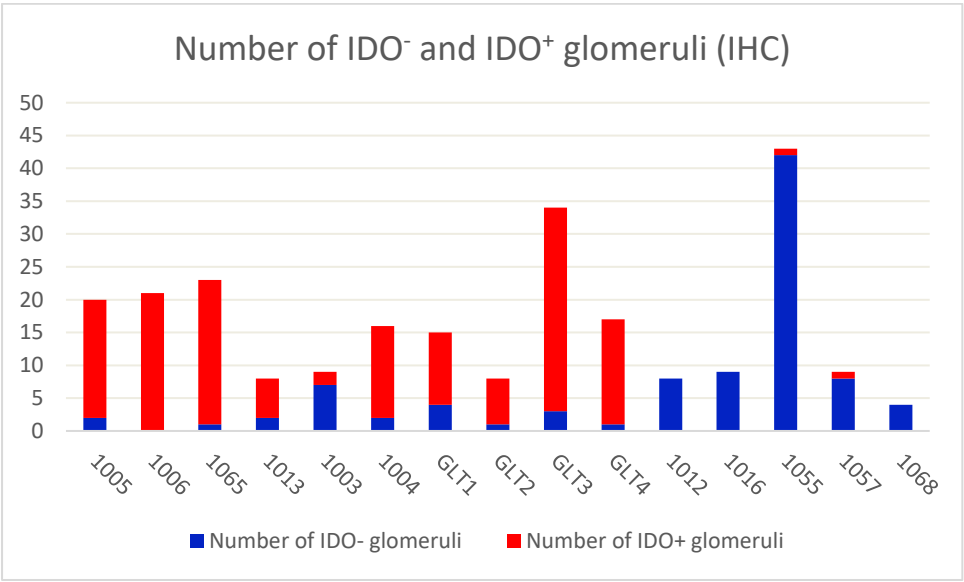


Figure S2. **IHC stains of IDO**. Upper panel shows the percentage of IDO+ glomeruli in glomerulitis- and glomerulitis+ biopsies. Bottom panel shows the number of IDO- and IDO+ glomeruli counted in each biopsy.