

HLA and kidney disease: from associations to mechanisms

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SUPPLEMENTARY MATERIAL

SUPPLEMENTARY TABLE 1: HLA ASSOCIATIONS IN GOODPASTURE'S DISEASE

HLA	Technique used	No. of patients	No. of controls	Ethnicity	Association	Odds Ratio	Reference
HLA-DR							
DRB1*01:01	molecular	82	117	Caucasian (British) ^{a,b}	protective	0.26	Fisher et al 1997 ¹
DRB1*01	molecular	139 ^c	665	Caucasian	protective	0.2	Phelps et al 1999 ²
DRB1*03:01	molecular	23	- ^d	Caucasian (USA)	risk	2.96	Huey et al 1993 ³
DRB1*04:04	molecular	23	- ^d	Caucasian (USA)	risk	4.19	Huey et al 1993 ³
DRB1*04	molecular	139 ^c	665	Caucasian	risk	1.4	Phelps et al 1999 ²
DRB1*04:04	molecular	44	200	Chinese	risk	4.67	Yang et al 2009 ⁴
DR7	molecular	36	202	Caucasian (Australian)	protective	-	Dunckley et al 1991 ⁵
DRB1*07:01	molecular	82	117	Caucasian (British) ^b	protective	0.15	Fisher et al 1997 ¹
DRB1*07	molecular	139 ^c	665	Caucasian	protective	0.1	Phelps et al 1999 ²
DRB1*09:01	molecular	140	599	Han Chinese	protective	0.4	Xie et al 2017 ⁶
DRB1*15:01	molecular	36	202	Caucasian (Australian)	risk	4.8	Dunckley et al 1991 ⁵
DRB1*15:01	molecular	12	- ^d	Caucasian (French)	risk	42	Mercier et al 1992 ⁷
DRB1*15:01	molecular	23	- ^d	Caucasian (USA)	risk	43	Huey et al 1993 ³
DRB1*15:01	molecular	82	117	Caucasian (British) ^b	risk	8.3	Fisher et al 1997 ¹
DRB1*15:01	molecular	139 ^c	665	Caucasian	risk	8.5	Phelps et al 1999 ²
DRB1*15	molecular	15	100	Swedish	risk	7.4	Persson et al 2004 ⁸
DRB1*15:01	molecular	16	561	Japanese	risk	6.4	Kitagawa et al 2008 ⁹
DRB1*15:01	molecular	44	200	Chinese	risk	3.63	Yang et al 2009 ⁴
DRB1*15:01	molecular	140	599	Han Chinese	risk	4.6	Xie et al 2017 ⁶
HLA-DQ^e							
DQA1*05:02	molecular	140	599	Han Chinese	risk	30.7	Xie et al 2017 ⁶

DQB1*03:03 ^f	molecular	140	599	Han Chinese	protective	0.3	Xie et al 2017 ⁶
HLA-DP							
DPB1*04:01	molecular	44	200	Chinese	protective	0.16	Luo et al 2011 ¹⁰

^a Ethnicity reported as and when described in original report. ^b Patients from the studies of Rees et al (Lancet 1978, serological typing, 17 patients, 100 controls) and Burns et al (QJM 1995, molecular typing, 53 patients, 1103 controls) were also studied in Fisher et al (Kidney Int 1997; personal communication Andrew Rees). Findings were consistent across studies and this cohort is represented in this table by Fisher et al 1997. ^c Meta-analysis of four studies (Dunckley, Mercier, Fisher, Huey). ^d Estimated control population allele frequency from 11th International Histocompatibility Workshop. ^e DQB1*06:02 (and DQB1*06), DQB1*03:02 and DQB1*05:01 associations for this disease are omitted because of LD with DR15, DR4 and DR1 respectively. ^f LD with DRB1*09:01.

SUPPLEMENTARY TABLE 2: HLA ASSOCIATIONS IN MEMBRANOUS NEPHROPATHY

HLA	Technique used	No. of patients	No. of controls	Ethnicity	Association	Odds Ratio	Reference
Class I							
Aw33 (A33) ^a	serological	22	312	Chinese (Taiwan) ^b	risk	5.12	Huang et al 1989 ¹¹
B8	serological	21	122	European	risk	4.3	Muller et al 1981 ¹²
B8	not stated	28	104	European	risk	6.84	Le Petit et al 1982 ¹³
B8	serological	55	1000	Caucasian	risk	2.64	Papiha et al 1987 ¹⁴
B*08:01	GWAS + HLA allele imputation	323	345	European	risk	4.47	Sekula et al 2017 ¹⁵
B18 ^c	serological	32	60	Caucasian	risk	5	Klouda et al 1979 ¹⁶
C*07:01	GWAS + HLA allele imputation	323	345	European	risk	2.94	Sekula et al 2017 ¹⁵
Class II							
HLA-DR							
DRw3 (DR3)	serological	32	60	European	risk	12	Klouda et al 1979 ¹⁶
DR3	serological	21	122	European	risk	10.7	Muller et al 1981 ¹²
DR3	serological	26	74	European	risk	7.42	Le Petit et al 1982 ¹³
DR3	serological	54	70	Caucasian	risk	3.64	Papiha et al 1987 ¹⁴
DR3	serological + RFLP	31	55	Caucasian	risk	2.9	Vaughan et al 1989 ¹⁷
DR3	serological	22	312	Chinese (Taiwan)	risk	6.81	Huang et al 1989 ¹¹
DR3	serological	250	4506	White & African-American	risk	2.22	Freedman et al 1994 ¹⁸
DRB1*03:01	molecular	50	100	British	risk	10.6	Vaughan et al 1995 ¹⁹
DRB1*03:01	molecular	29	93	Greek	risk	3	Vaughan et al 1995 ¹⁹
DR3	molecular	178	100	European	risk	6.6	Chevrier et al 1997 ²⁰
DRB1*03:01	molecular	261	599	Han Chinese	risk	3.96	Cui et al 2017 ²¹
DRB1*03:01	GWAS + HLA allele imputation	323	345	European	risk	6.15	Sekula et al 2017 ¹⁵
DR4	serological	50	158	Japanese	protective	0.3	Tomura et al 1984 ²²
DR5 (DR11, DR12)	serological	250	4506	White & African-American	risk	1.61	Freedman et al 1994 ¹⁸

DR7	serological	190	4039	White	protective	0.53	Freedman et al 1994 ¹⁸
DRw8	serological	50	158	Japanese	protective	0.1	Tomura et al 1984 ²²
DRw9	serological	50	158	Japanese	protective	0.1	Tomura et al 1984 ²²
DR2	serological	50	884	Japanese	risk	7.12	Hiki et al 1984 ²³
DR2	serological	50	158	Japanese	risk	6.5	Tomura et al 1984 ²²
DR2	serological	15	100	Japanese	risk	6.3	Naito et al 1987 ²⁴
DR2	serological	30	50	Japanese	risk	9.3	Ogahara et al 1992 ²⁵
DR2	molecular	79	193	British & Greek	protective	0.21	Vaughan et al 1995 ¹⁹
DRB1*15:01	molecular	183	811	Japanese	risk	3.09	Thiri et al 2016 ²⁶
DRB1*15:01	molecular	261	599	Han Chinese	risk	4.65	Cui et al 2017 ²¹
DRB1*15:01	NGS	392	385	Han Chinese	risk	24.9	Le et al 2017 ²⁷
DRB3*01:01	molecular	50	100	British	risk	4.2	Vaughan et al 1995 ¹⁹
DRB3*01	GWAS + HLA allele imputation	323	345	European	risk	3.98	Sekula et al 2017 ¹⁵
DRB3*02:02	NGS	392	385	Han Chinese	risk	17.7	Le et al 2017 ²⁷
DRB3*99:01	GWAS + HLA allele imputation	323	345	European	protective	0.29	Sekula et al 2017 ¹⁵
MT1 (DR1, 2, 10) ^d	serological	50	103	Japanese	risk	24.47	Hiki et al 1984 ²³
MT1 (DR1, 2, 10) ^d	serological	50	158	Japanese	risk	4.1	Tomura et al 1984 ²²
MT2 (DR3, 5, 8) ^d	Serological	21	122	European	risk	5.4	Muller et al 1981 ¹²
MT3 (DR4, 7, 9) ^d	serological	50	103	Japanese	protective	0.15	Hiki et al 1984 ²³
MT3 (DR4, 7, 9) ^d	Serological	50	158	Japanese	protective	0.2	Tomura et al 1984 ²²
HLA-DQ							
DQA1	serological + RFLP	31	55	Caucasian	risk	6.8	Vaughan et al 1989 ¹⁷
DQw1	serological	30	50	Japanese	risk	6.5	Ogahara et al 1992 ²⁵
DQA	serological + RFLP	30	50	Japanese	risk	39.9	Ogahara et al 1992 ²⁵
DQA1*02:01	molecular	52	100	British	protective	0.4	Vaughan et al 1995 ¹⁹
DQA1*05:01 ^e	molecular	50	100	British	risk	7.4	Vaughan et al 1995 ¹⁹

DQA1 rs2187668	GWAS	556	2338	White (French, Dutch, British)	risk	4.32	Stanescu et al 2011 ²⁸
DQA1 rs2187668	molecular	1112	1020	Chinese	risk	2.42	Lv et al 2013 ²⁹
DQA1 rs2187668	molecular	89	286	Spanish	risk	3.7	Bullich et al 2014 ³⁰
DQA1 rs2187668	molecular	530	982 [†]	Caucasian, African-American, Hispanic, South Asian, East Asian, Native American	risk	2.63	Saeed et al 2014 ³¹
DQA1 rs2187668	molecular	114	95	Indian	risk	5.26	Ramachandran et al 2016 ³²
DQA1 rs9272729	GWAS + HLA allele imputation	323	345	European	risk	7.07	Sekula et al 2017 ¹⁵
DQA1*05:01	GWAS + HLA allele imputation	323	345	European	risk	6.23	Sekula et al 2017 ¹⁵
DQB	serological + RFLP	30	50	Japanese	risk	39.9	Ogahara et al 1992 ²⁵
DQB1*02:01	molecular	48	100	British	risk	10	Vaughan et al 1995 ¹⁹
DQB1*02:01	GWAS + HLA allele imputation	323	345	European	risk	5.89	Sekula et al 2017 ¹⁵
DQB1*06:02	molecular	183	811	Japanese	risk	3.1	Thiri et al 2016 ²⁶

GWAS: genome-wide association study; NGS: next-generation sequencing; RFLP: restriction fragment length polymorphism.

^a A33 is in LD with DR3. ^b Ethnicity reported as and when described in original publication. ^c B18 is in LD with DR3. ^d MT: now-superseded terminology, describing supertypic DR specificities: MT1 (DR1, 2, 10), MT2 (DR3, 5, 8), MT3 (DR4, 7, 9). See Morris, P.J., Ting, A. (1983) HLA-DR and Renal Transplantation, in Inman, F.P., Kindt, T.J. (eds) Contemporary Topics in Molecular Immunology, Springer, Boston, MA. ^e DQA1:05*01 is in LD with DR3. ^f Control group consists of patients with PLA2R-negative MN and other causes of CKD.

SUPPLEMENTARY TABLE 3: HLA ASSOCIATIONS IN ANCA-ASSOCIATED VASCULITIS

HLA	Technique used	No. of patients	No. of controls	Ethnicity	Association	Odds Ratio	Reference
PR3-AAV							
Class I							
B8	serological	31	418	Caucasian ^a	risk	2.71	Katz et al 1979 ³³
B55	serological	16	472	Japanese	risk	8.44	Nakamaru et al 1996 ³⁴
Class II							
HLA-DR							
DR1	serological	27 ^b	105	Caucasian	risk	6.96	Papiha et al 1992 ³⁵
DR1	serological	37 ^c	-	Greek	risk	3.03	Boki et al 1997 ³⁶
DRB1*04	molecular	32 ^d	N/A	European	risk	3.24	Gencik et al 1999 ³⁷
DR9	serological	16	472	Japanese	risk	4.74	Nakamaru et al 1996 ³⁴
DRB1*12:02	molecular	19	200	Chinese	risk	5.07	Luo et al 2011 ³⁸
DRB1*13	molecular	76	-	European	protective	0.40	Gencik et al 1999 ³⁷
DRB1*14	molecular	74	273	Caucasian	risk	5.9	Cao et al 2011 ³⁹
DR2	serological	17 ^b	113	White	risk	6.89	Elkon et al 1983 ⁴⁰
DRB1*15	molecular	16	106	African American	risk	73.3	Cao et al 2011 ³⁹
DRB1*15	molecular	74	273	Caucasian	risk	2.2	Cao et al 2011 ³⁹
HLA-DQ							
DQB1*06:03	molecular	76	-	European	protective	0.2	Gencik et al 1999 ³⁷
HLA-DP							
DP rs3117242	GWAS	1521	6858	European	risk	7.03	Lyons et al 2012 ⁴¹
DPA1 rs9277341	GWAS	578 ^e	1820	European	risk	3.66 ^f	Xie et al 2013 ⁴²
DPA1 rs9277341	GWAS	1361	4723	European	risk	3.69 ^f	Merkel et al 2017 ⁴³
DPB1*02:01	molecular	282	369	German	protective	0.47	Heckmann et al 2008 ⁴⁴

DPB1*03:01	molecular	282	369	German	protective	0.1	Heckmann et al 2008 ⁴⁴
DPB1*03:01	molecular	148	89	German	protective	0.02	Jagiello et al 2004 ⁴⁵
DPB1*04:01	molecular	148	89	German	risk	3.91	Jagiello et al 2004 ⁴⁵
DPB1*04:01	molecular	282	369	German	risk	3.38	Heckmann et al 2008 ⁴⁴
DPB1*04:01	molecular	90	176	European	risk	5.27	Hilhorst et al 2016 ⁴⁶
DPB1*04 rs9277554	GWAS	578 ^e	1820	European	risk	6.25 ^g	Xie et al 2013 ⁴²
DPB1 rs1042169, rs141530233	GWAS	1361	4723	European	risk	6.09, 6.19	Merkel et al 2017 ⁴³
DPB1 rs3117242	molecular + mass spectrometry	100 ^h	485	Han Chinese	risk	2.09	Wu et al 2017 ⁴⁷
MPO-AAV							
Class II							
HLA-DR							
DRB1*09:01	molecular	64	265	Japanese	risk	2.44	Tsuchiya et al 2003 ⁴⁸
DRB1*09:01	molecular	50	77	Japanese	risk	2.21	Tsuchiya et al 2006 ⁴⁹
DRB1*09:01	molecular	116	265	Japanese	risk	2.05	Tsuchiya et al 2013 ⁵⁰
DRB1*09:01	molecular	377	596	Japanese	risk	1.57	Kawasaki et al 2016 ⁵¹
DRB1*11:01	molecular	64	265	Japanese	risk	4.41	Tsuchiya et al 2003 ⁴⁸
DRB1*11:01	molecular	107	200	Chinese	risk	2.53	Luo et al 2011 ³⁸
DRB1*13:02	molecular	377	596	Japanese	protective	0.42	Kawasaki et al 2016 ⁵¹
DRB1*16	molecular	16	106	African American	risk	1.1	Cao et al 2011 ³⁹
HLA-DQ							
DQ rs5000634	GWAS	556	6858	European	risk	1.54 ¹	Lyons et al 2012 ⁴¹
DQA2 rs3998159, rs7454108	GWAS	378	4723	European	risk	2.72, 2.73	Merkel et al 2017 ⁴³
DQB1*03:03	molecular	50	77	Japanese	risk	2.35	Tsuchiya et al 2006 ⁴⁹
DQB1 rs1049072	GWAS	378	4723	European	risk	2.37	Merkel et al 2017 ⁴³
HLA-DP							
DPB1*04:01	molecular	377	593	Japanese	protective	0.4	Kawasaki et al 2016 ⁵¹

EGPA							
Class II							
HLA-DR							
DRB1*04 ^j	molecular	102	341	German	risk	1.86	Wieczorek et al 2008 ⁵²
DRB1*07 ^j	molecular	48	350	White Italian	risk	2.42	Vaglio et al 2007 ⁵³
DRB1*07 ^j	molecular	102	341	German	risk	1.57	Wieczorek et al 2008 ⁵²
DRB1*13	molecular	102	341	German	protective	0.5	Wieczorek et al 2008 ⁵²
DRB3	molecular	48	350	White Italian	protective	0.54	Vaglio et al 2007 ⁵³
DRB4 ^j	molecular	48	350	White Italian	risk	2.49	Vaglio et al 2007 ⁵³

Data pertain to antigenic specificities (PR3, MPO) where available. Data analysed by phenotypic description only (GPA or MPA) are also included in the PR3-AAV and MPO-AAV sections. GWAS: genome-wide association study.

^a Ethnicity reported as and when described in original publication. ^b No ANCA specificities stated. ^c 77% of subjects were cANCA positive. No stratification of data by ANCA. ^d Subgroup of PR3-ANCA+ patients with ESKD. ^e Cohort of 750 patients; those included were cANCA-positive group. ^f Major allele (T) for rs9277341 demonstrates risk with OR 3.66 (Dr Katherine Siminovitch, personal communication). ^g Major allele (C) for rs9277554 demonstrates risk with OR 6.25 (Dr Katherine Siminovitch, personal communication). ^h 81/100 GPA patients were PR3-ANCA positive. Analysis presented only for GPA, independent of autoantigen. ⁱ Minor allele (G) for rs5000634 demonstrates risk with OR 1.54 (Dr Paul Lyons, personal communication). ^j HLA-DRB1*04 and HLA-DRB1*07 are in linkage disequilibrium with the HLA-DRB4 gene, which corresponds to the DR53 serotype.

SUPPLEMENTARY TABLE 4: HLA ASSOCIATIONS IN IgA NEPHROPATHY & HENOCH-SCHÖNLEIN PURPURA

HLA	Technique used	No. of patients	No. of controls	Ethnicity	Association	Odds Ratio	Reference
IgA NEPHROPATHY							
Class I							
A rs2523946	GWAS	4137	7734	Han Chinese ^a	risk	1.21	Yu et al 2012 ⁵⁴
A*11:01	GWAS + HLA allele imputation ^b	1434	4270	Han Chinese	risk	1.19	Yu et al 2012 ⁵⁴
B27	serological	196	4506	White & African-American	risk	2.1	Freedman et al 1994 ⁵⁵
Bw35 (B35)	serological	43	105	European	risk	4.25	Berthouix et al 1978 ⁵⁶
B35	serological	130	472	Japanese	risk	2.3	Hiki et al 1990 ⁵⁷
B*40:01	GWAS + HLA allele imputation ^b	1434	4270	Han Chinese	risk	1.34	Yu et al 2012 ⁵⁴
Class II							
HLA-DR							
DRA	molecular	313	816	Japanese	risk	1.9	Akiyama et al 2002 ⁵⁸
DR1	serological	196	4506	White & African-American	risk	1.89	Freedman et al 1994 ⁵⁵
DR2	serological	196	4506	White & African-American	protective	0.57	Freedman et al 1994 ⁵⁵
DRB1*03	molecular	213	1569	Swedish	protective	0.54	Vuong et al 2013 ⁵⁹
DR4	serological	80	884	Japanese	risk	2.73	Hiki et al 1982 ⁶⁰
DR4	serological	42	158	Japanese	risk	3.1	Kashiwabara et al 1982 ⁶¹
DR4	serological	75	135	Japanese	risk	2.63	Kasahara et al 1982 ⁶²
DR4	serological	70	100	Japanese	risk	2.7	Naito et al 1987 ²⁴
DR4	serological	130	472	Japanese	risk	2.1	Hiki et al 1990 ⁵⁷
DR4	molecular	56	139	Japanese	risk	2.72	Abe et al 1993 ⁶³
DRB1*04:03	molecular	935	2088	Han Chinese	risk	1.32	Ji Yun et al 2012 ⁶⁴
DRB1*04:05	molecular	935	2088	Han Chinese	risk	1.27	Ji Yun et al 2012 ⁶⁴
DRB1*07:01:01	molecular	139	143	Han Chinese	protective	0.21	Cao et al 2008 ⁶⁵

DRw8 (DR8)	serological	70	100	Japanese	protective	0.3	Naito et al 1987 ²⁴
DRB1*14:05:01	molecular	139	143	Han Chinese	risk	3.94	Cao et al 2008 ⁶⁵
DRB1 rs660895	GWAS	4137	7734	Han Chinese	risk	1.34	Yu et al 2012 ⁵⁴
HLA-DQ							
DQA/B rs1794275	GWAS	4137	7734	Han Chinese	risk	1.3	Yu et al 2012 ⁵⁴
DQA/B, DRA/B rs7763262	GWAS	7658	12954	Han Chinese & European	risk	1.41	Kiryluk et al 2014 ⁶⁶
DQA1*01:01	GWAS + HLA allele imputation	7658	12954	Han Chinese & European	risk	1.53	Kiryluk et al 2014 ⁶⁶
DQA1*01:02	GWAS + HLA allele imputation	7658	12954	Han Chinese & European	protective	0.68	Kiryluk et al 2014 ⁶⁶
DQB1 rs9275596	GWAS	3144	2822	Han Chinese & European	protective	0.63	Gharavi et al 2011 ⁶⁷
DQB1 rs2856717	GWAS	3144	2822	Han Chinese & European	protective	0.73	Gharavi et al 2011 ⁶⁷
DQB1*02:01	molecular	87	111	British	protective	0.35	Fennessy et al 1996 ⁶⁸
DQB1*02:01	GWAS + HLA allele imputation	431	5326 ^d	European	protective	0.66	Feehally et al 2010 ⁶⁹
DQB1*02:01	GWAS + HLA allele imputation	7658	12954	Han Chinese & European	protective	0.71	Kiryluk et al 2014 ⁶⁶
DQw7 (DQB1*03:01) ^c	molecular	36	1103	British Caucasian	risk	6.17	Li et al 1991 ⁷⁰
DQB1*03:01, *03:03, *04:02	molecular	98	94	British Caucasian	risk	5.5	Moore et al 1990 ⁷¹
DQB1*03:01	GWAS + HLA allele imputation	7658	12954	Han Chinese & European	risk	1.33	Kiryluk et al 2014 ⁶⁶
DQB1*03:01	molecular	217	229	Han Chinese	protective	0.53	Wang et al 2016 ⁷²
DQB1*03:02	GWAS + HLA allele imputation ^b	1434	4270	Han Chinese	risk	1.42	Yu et al 2012 ⁵⁴
DQw4 (DQ4) ^c	serological	50	472	Japanese	risk	4.97	Hiki et al 1991 ⁷³
DQw4,8,9 (DQ3,4,8,9)	molecular	56 ^e	121	Japanese	risk	3.86	Abe et al 1993 ⁶³
DQB1*05:01 (rs3115573, rs 3130315)	GWAS + HLA allele imputation	431	5326 ^d	European	risk	1.51, 1.62 ^f	Feehally et al 2010 ⁶⁹
DQB1*06:01	molecular	217	229	Han Chinese	risk	2.09	Wang et al 2016 ⁷²
DQB1*06:02	molecular	40	40	Finnish	protective	0.56	Fennessy et al 1996 ⁶⁸
DQB1*06:02	GWAS + HLA allele imputation ^b	1194	902	Han Chinese	protective	0.47	Gharavi et al 2011 ⁶⁷
HLA-DP							
DPA1 rs1883414	GWAS	3144	2822	Han Chinese & European	protective	0.77	Gharavi et al 2011 ⁶⁷

HENOCH-SCHÖNLEIN PURPURA							
Class I							
A1	molecular	110	250	Turkish	protective	0.21	Peru et al 2008 ⁷⁴
A2	molecular	110	250	Turkish	risk	1.71	Peru et al 2008 ⁷⁴
A11	molecular	110	250	Turkish	risk	2.19	Peru et al 2008 ⁷⁴
A*11:01	molecular	56	66	Mongolian	risk	2.33	Ren et al 2012 ⁷⁵
A*26:01	molecular	50	96	Han Chinese	risk	5.94	Ren et al 2012 ⁷⁵
B*07	molecular	56	66	Mongolian	protective	0.19	Ren et al 2012 ⁷⁵
B*15:01	molecular	56	66	Mongolian	risk	3.34	Ren et al 2012 ⁷⁵
B35	molecular	110	250	Turkish	risk	2.29	Peru et al 2008 ⁷⁴
B*35:03	molecular	50	96	Han Chinese	risk	3.04	Ren et al 2012 ⁷⁵
B*40	molecular	56	66	Mongolian	protective	0.26	Ren et al 2012 ⁷⁵
B*41:02	molecular	349	355	Spanish	risk	5.7	Lopez-Mejias et al 2015 ⁷⁶
B49	molecular	110	250	Turkish	protective	0.31	Peru et al 2008 ⁷⁴
B50	molecular	110	250	Turkish	protective	0.13	Peru et al 2008 ⁷⁴
B*52	molecular	50	96	Han Chinese	risk	3.2	Ren et al 2012 ⁷⁵
Class II							
HLA-DR							
DRB1*01	molecular	50	145	Caucasian	risk	2.5	Amoli et al 2001 ⁷⁷
DRB1*01	molecular	58	145	Caucasian	risk	2.2	Amoli et al 2002 ⁷⁸
DRB1*01:03	molecular	342	303	Spanish	risk	8.27	Lopez-Mejias et al 2015 ⁷⁹
DRB1*03:01	molecular	342	303	Spanish	protective	0.26	Lopez-Mejias et al 2015 ⁷⁹
DRB1*07	molecular	152	109	Italian	protective	0.39	Amoroso et al 1997 ⁸⁰
DRB1*07	molecular	50	145	Caucasian	protective	0.3	Amoli et al 2001 ⁷⁷

DRB1*07	molecular	58	145	Caucasian	protective	0.3	Amoli et al 2002 ⁷⁸
DRB1*10	molecular	110	250	Turkish	protective	0.1	Soylemezoglu et al 2008 ⁸¹
DRB1*11	molecular	110	250	Turkish	risk	1.98	Soylemezoglu et al 2008 ⁸¹
DRB1*14	molecular	110	250	Turkish	risk	1.84	Soylemezoglu et al 2008 ⁸¹
DRB1*17	molecular	110	250	Turkish	protective	0.25	Soylemezoglu et al 2008 ⁸¹
HLA-DQ							
DQA1*02	molecular	152	109	Italian	protective	0.39	Amoroso et al 1997 ⁸⁰

GWAS: genome-wide association study.

^a Ethnicity reported as and when described in original publication. ^b HLA allele imputation in discovery cohort only. ^c In LD with DR4. ^d Control population includes parents of patients with IgAN. ^e Includes 32 patients with IgAN, 24 patients with HSP. ^f Denotes OR for imputed allele and SNPs, respectively.

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