

Supplementary Material for the Article: Exploring the Involvement of *ERAP1* in the Pathogenesis of Non-Infectious Uveitis: A Systematic Review

Supplementary Table S1. Frequent single nucleotide polymorphisms of *ERAP1* gene in the human population investigated in NIU studies—genetic characteristics (data from dbSNP—the ALFA project) [41–50].

SNPs	Location	Type	Substituted amino acid	Minor allele frequency in European population (%)	Effect on enzyme activity or protein expression
rs3734016	Exon 2	missense	Glu (E) 56 Lys (K)	3.74	Undetected
rs26653	Exon 2	missense	Arg (R) 127 Pro (P)	67.88	Undetected
rs26618	Exon 5	missense	Ile (I) 276 Met (M)	23.77	Undetected
rs27895	Exon 6	missense	Gly (G) 346 Asp (D)	6.49	Undetected
rs2287987	Exon 6	missense	Met (M) 349 Val (V)	20.66	Undetected
rs30187	Exon 11	missense	Lys (K) 528 Arg (R)	65.03	Lower activity
rs10050860	Exon 12	missense	Asp (D) 575 Asn (N)	20.97	Higher activity
rs17482078	Exon 15	missense	Arg (R) 725 Gln (Q)	20.19	Lower activity
rs27044	Exon 15	missense	Gln (Q) 730 Glu (E)	71.91	Higher activity, on a shorter substrate
rs72773968	Exon 2	missense	Thr (T) 12 Ile (I)	12.74	Undetected
rs2032890	Intron	-	non-coding	26.48	Undetected
rs27529	Exon 9	missense	Ser (S) 453 Arg (R)	64.72	Undetected
rs2927615	Intron	eQTL	non-coding	23.28	Decreases ERAP1 expression
rs13154629	Intron	-	non-coding	21.09	Undetected
rs27432	Intron	eQTL	non-coding	65.91	Decreases ERAP1 expression

rs1065407	Intron	eQTL	non-coding	34.46	Decreases ERAP1 expression
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eQTL = expression quantitative trait locus

Supplementary Table S2. The ten most common *ERAP1* haplotypes in the human population-structural and functional characteristics [42, 53–58].

Included SNPs: rs3734016/rs26653/rs26618/rs27895/rs2287987/rs30187/rs10050860/rs17482078/rs27044				
Haplotype	Constitutive amino acids	Allotype frequency in European population (%)	Outcome	Association with diseases linked to uveitis
Hap1 (ancestral)	GLU/PRO/ILE/GLY/MET/LYS/ASP/ARG/GLN	14.0	High ERAP1 activity	Risk of AS and Psoriasis Protective against BD
Hap2	GLU/ARG/ILE/GLY/MET/LYS/ASP/ARG/GLN	14.4	High ERAP1 activity	Risk of AS and Psoriasis and BD
Hap3	GLU/ARG/ILE/GLY/MET/LYS/ASP/ARG/GLU	6.5	High ERAP1 activity	Risk of AS and Psoriasis
Hap4	GLU/ARG/ILE/GLY/MET/ARG/ASP/ARG/GLU	1.0	Moderate ERAP1 activity	Risk of AS
Hap5	GLU/ARG/ILE/ASP/MET/ARG/ASP/ARG/GLU	6.3	Moderate ERAP1 activity	Risk of AS
Hap6	GLU/PRO/ILE/GLY/MET/ARG/ASP/ARG/GLU	9.2	Low ERAP1 activity	Protective against AS
Hap7	LYS/PRO/ILE/GLY/MET/ARG/ASP/ARG/GLU	4.1	Moderate ERAP1 activity	Protective against AS

Hap8	GLU/PRO/ MET /GLY/MET/ ARG /ASP/ARG/ GLU	21.5	Moderate ERAP1 activity	Protective against BD
Hap9	GLU/PRO/ MET /GLY/MET/ ARG / ASN /ARG/ GLU	0.4	Moderate ERAP1 activity	Undetected
Hap10	GLU/PRO/ILE/GLY/ VAL / ARG / ASN / GLN / GLU	22.4	Low ERAP1 activity	Protective for AS Risk for BD

*the blue amino acids represent the variation from the ancestral haplotype Hap1; AS=ankylosing spondylitis; BD=Behçet's disease.

Supplementary Table S3: PRISMA 2020 for Abstract Checklist [59].

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	No
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	No
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	No
Synthesis of results	6	Specify the methods used to present and synthesize results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarize relevant characteristics of studies.	Yes

Section and Topic	Item #	Checklist item	Reported (Yes/No)
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favored).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	No
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	No
Registration	12	Provide the register name and registration number.	No

Supplementary Table S4: PRISMA 2020 Checklist [59].

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Supplementary
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 1
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 1
METHODS			

Section and Topic	Item #	Checklist item	Location where item is reported
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 4, 5
Information sources	6	Specify all databases, registers, websites, organizations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 4, 5
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 4, 5
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 4, 5
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 4, 5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Pages 7-11
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Pages 7-11
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	n/a
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	n/a
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Page 6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pages 6-11

Section and Topic	Item #	Checklist item	Location where item is reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pages 6-11
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	n/a
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	n/a
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	n/a
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	n/a
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	n/a
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 4-6
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Pages 6
Study characteristics	17	Cite each included study and present its characteristics.	Pages 7-11
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	n/a
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pages 7-11
Results of syntheses	20a	For each synthesis, briefly summarize the characteristics and risk of bias among contributing studies.	n/a
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its	Pages 7-11

Section and Topic	Item #	Checklist item	Location where item is reported
		precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	n/a
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	n/a
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	n/a
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	n/a
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 12-15
	23b	Discuss any limitations of the evidence included in the review.	n/a
	23c	Discuss any limitations of the review processes used.	n/a
	23d	Discuss implications of the results for practice, policy, and future research.	Page 1, 15-16
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	n/a
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	n/a
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	n/a
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 16
Competing interests	26	Declare any competing interests of review authors.	Page 16
Availability of	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from	n/a

Section and Topic	Item #	Checklist item	Location where item is reported
data, code and other materials		included studies; data used for all analyses; analytic code; any other materials used in the review.	

n/a: not applicable