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Study population

The study population comprised 2,465 cases from four vasculitides (GCA, TAK, AAV, and IgAV) and 4,632 unaffected controls, organised as follows: the GCA dataset comprised two independent populations, one from Spain (763 cases and 850 controls) and another from UK (251 cases and 1000 controls); the TAK dataset included two populations, one of European ancestry from North America (USA/Canada; 112 cases and 599 controls) and one from Turkey (339 cases and 516 controls); the AAV dataset included 685 cases and 1,000 controls from UK; and the IgAV dataset comprised a population from Spain (315 cases and 667 controls). GCA and TAK patients were diagnosed following their respective 1990 American College of Rheumatology classification criteria [1, 2]. Additionally, GCA patients were only enrolled if they had a positive temporal artery biopsy, as described [3]. The EMEA clinically-based algorithm was used to classify AAV patients [4]. The IgA vasculitis condition was diagnosed accordingly with both the guidelines included in Michel *et al.* [5] and the American College of Rheumatology classification criteria for this disease [6]. The most relevant clinical data of each case cohort were described elsewhere [7-10]. All participants signed a written informed consent before being enrolled in the study. The procedures were followed according to the ethical standards of the Ethics Committees on human experimentation of the responsible committee on human experimentation (institutional and national) of all participant centres.

Figure S1. Manhattan plot representation of the overall cross-disease meta-analysis of the imputed HLA region. The $-\log_{10}$ of the inverse variance-weighted meta-analysis p-values are plotted against their physical chromosomal position. The diamond size depends on the linkage disequilibrium (r^2) with the lead signal (rs6457617).

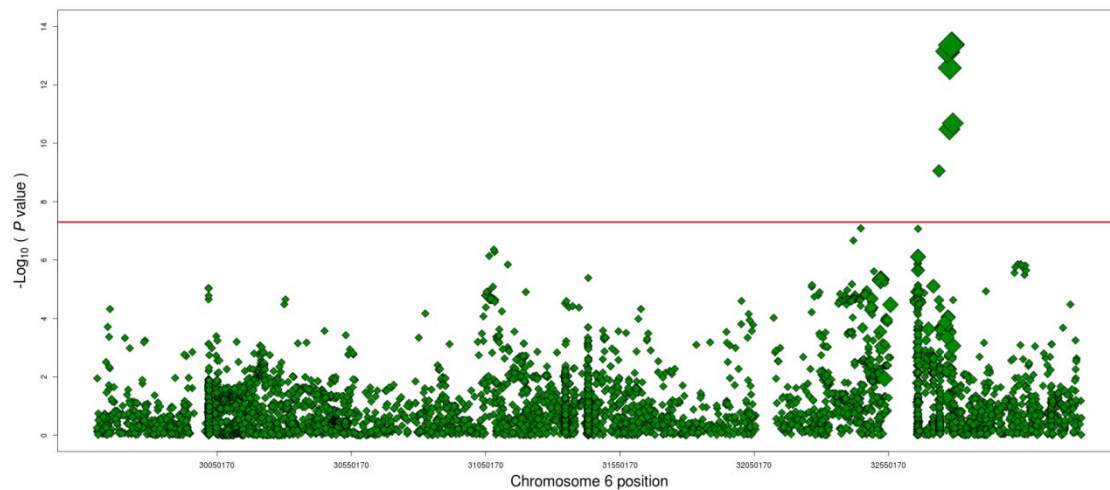
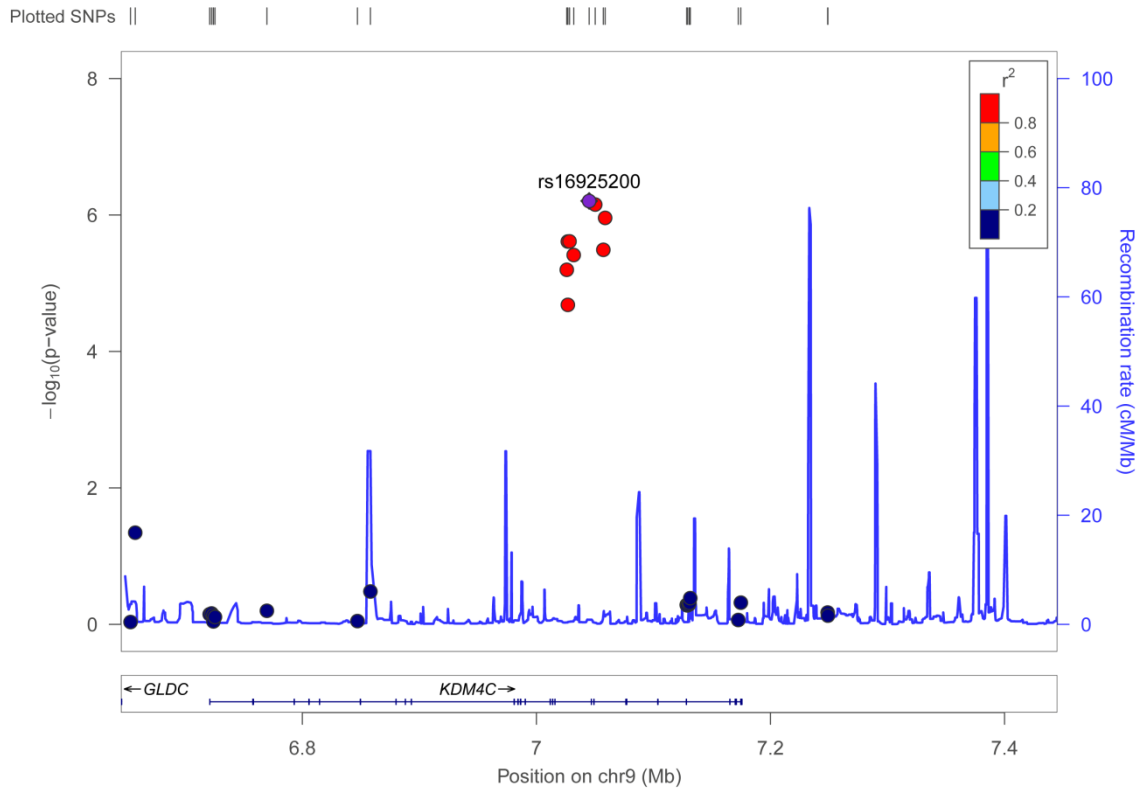


Figure S2. Regional association plot of the *KDM4C* region. The lead variant (rs16925200) is highlighted in violet.



References for 'Study population' and Table S4.

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