SUPPLEMENTARY DATA

Authors:
Jie Shen M.D. Ph.D.[1,2,* †], Tingwei Guo Ph.D.[3,4,* †], Tao Wang M.D. Ph.D[5], Yisong Zhen Ph.D[6], Xiao Ma M.S.[2], Yuan Wang B.S.[7], Zhi-Xin Zhang [8], Jian-Ping Cai [9,10],Wei Mao [11], Fa-Ming Zhu [12],Jian-Ping Li [13], Zhen-Lei Wang [14], De-Mei Zhang [15], Meng-Li Liu [16], Xiao-Yan Shan [8], Bo-Wei Zhang [17], Chuan-Fu Zhu [18], Zhi-Hui Deng [19], Wei-Jian Yu [20], Qiang Chen [21], Guo-Liang Li [22], Tao Yang M.D. Ph.D.[1], Shan Lu [23], Qin-Qin Pan [2], Su Fan [2], Xiao-Yan Wang [2], Xing Zhao [2], Xin-Yun Bi [2], Yan-Hui Qiao [24], Pin-Can Su [25], Rong Lv [26], Guo-Ying Li [27], Heng-Cong Li [28], Bin Pei [29], Li-Xin Jiao [30], Gang Shen [31], Jie Liu [32], Zhi-Hui Feng [33], Yu-Ping Su [34], Yu-Bin Xie [35], Wen-Ying Di [36], Xin-Yu Wang [37], Xiang Liu [38], Xiao-Ping Zhang [39], Dan Du [40], Qi Liu [40], Yin Han [40], Jia-Wei Chen M.D.[1], Min Gu [41], Leslie Baier Ph.D.[42], China Marrow Donor Program.

* These authors contributed equally to this work. † Corresponding author: Dr. Shen at the center of immunological genetics and HLA typing, the First Affiliated Hospital of Nanjing Medical University, Nanjing, Jiangsu 210029, China or at shenjie@njmu.edu.cn; or Dr. Guo at the Department of Genetics, Albert Einstein College of Medicine, Bronx 10461, USA, or at tingwei.guo@einstein.yu.edu or at tingweiguo@gmail.com.

The Supplementary Text have the following sections in order:

1. HLA Genotype in CMDP database
2. Allele frequencies of low resolution and high resolution HLA allele
3. Association between BMI associated HLA alleles with body weight and height
4. Legend of Supplementary Tables
5. Supplementary Figure S1
6. References

1. HLA Genotype in CMDP database

HLA data, including *HLA-A*, *-B*, *-C*, *-DRB1* and *-DQB1*, was submitted to the CMDP database to be used for matching potential donors for transplantation recipients suffering from a variety of blood, bone marrow or immune system disorders. No data is available for the DRB3/4/5 locus because typing of this locus is not routinely done by HLA laboratories. HLA high resolution alleles are described with the first two fields (four-digit code) of HLA allele nomenclature, representing protein level assignment. HLA low resolution genotype are described with the first fields (two-digit code, group allele) of HLA allele nomenclature, representing a group of collection of proteins expressed by the respective HLA gene. Many of the low resolution HLA alleles contain multiple high resolution alleles.

2. Allele frequencies of low resolution and high resolution HLA allele

The three most common low resolution alleles for each of the five loci were as follows: A*02 (30.64%), A*11 (22.48%), and A*24 (16.44%); B*40 (15.44%), B*15 (14.44%) and B*13 (10.97%); C*03 (42.85%), C*07 (17.56%) and C*01(16.67%); DRB1*15 (15.11%), DRB1*09 (14.50%) and DRB1*12 (12.13%); and DQB1*03 (42.85%), DQB1*06 (22.64%) and DQB1*05 (16.22%) (Supplementary Table 1). The three most common high resolution alleles for each of the five loci were as follows: A*11:01 (20.89%), A*24:02 (15.69%), and A*02:01 (12.54%); B*46:01 (10.08%), B*40:01 (9.86%) and B*13:02 (5.94%); C*01:02 (15.92%), C*07:02 (15.28%) and C*03:04 (10.00%); DRB1*15:01 (11.84%), DRB1*07:01 (9.34%), DRB1*12:02 (8.24%); and DQB1*03:01 (21.05%), DQB1*03:03 (15.82%) and DQB1*06:01(10.26%) (Supplementary Table 1). These results are similar to those from previous data in Chinese populations. [1,2]

3. Association between BMI associated HLA alleles with body weight and height

Since our primary interest was in body weight, and BMI is influenced by both weight and height, the association with BMI was further adjusted for weight and height, respectively (supplementary Table 3). Many of these alleles had effects on both weight and height, with the exception of C*07, B*08, B*46, DRB1*03, DRB1*07:01 and DRB1*12 which affect weight only (Supplementary Table 2).

SUPPLEMENTARY DATA

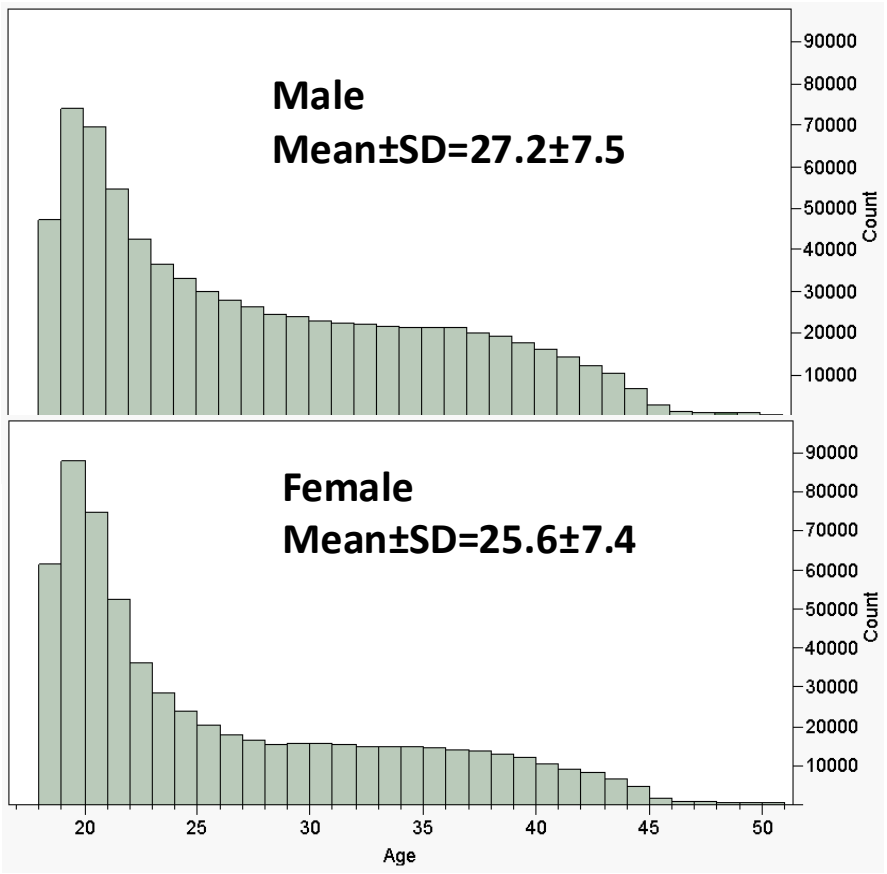
Supplementary Table S1. The HLA allele frequencies of low and high resolution alleles in CDMP data.
The "Common" column indicates whether the alleles have the frequency more than 0.001 (yes). "Total" and "N" are the number of individuals with genotype at those loci and the total number of the individuals with this allele.

Supplementary Table S2. The association between BMI-associated HLA alleles and body weight and height.
P_weight_adj_height and P_height_adj_weight are the association p value for BMI after adjusted height and weight for weight and height respectively, beta_weight_adj_height, beta SE_weight_adj_height, beta_height_adj_weight and beta SE_height_adj_weight are the linear regression slope (beta) and its standard error for weight and height respectively.

Supplementary Table S3. Top HLA alleles associated with BMI, obesity and overweight in CDMP.
P_BMI, P_Obesity and P_Overweight are the association p value for BMI, Obesity and Overweight. β (SE)_BMI are the linear regression slope (beta) and its standard error. N is the number of the individual for association test. OR(95% CI)_obesity and OR(95% CI)_overweight are the Odds Ratio and 95% confidence interval of obesity and overweight respectively.

Supplementary Table S4. The square of pairwise correlation (r^2) matrix of all BMI-associated HLA alleles.

Supplementary Figure S1. Age distribution in CDMP data for male (upper panel) and female (lower panel).



Reference

1. Hei AL, Li W, Deng ZH, et al. Analysis of high-resolution HLA-A, -B, -Cw, -DRB1, and -DQB1 alleles and haplotypes in 718 Chinese marrow donors based on donor-recipient confirmatory typings. Int J Immunogenet 2009;36:275-82.

2. Zhou XY, Zhu FM, Li JP, et al. High-Resolution Analyses of Human Leukocyte Antigens Allele and Haplotype Frequencies Based on 169,995 Volunteers from the China Bone Marrow Donor Registry Program. PLoS One 2015;10:e0139485.