



**Supplemental Figure S1.** Impact of proxy generation parameters on imputation accuracy. **(a)** Imputation accuracy (Genotype level R2) of proxy-panel-based imputation protocol with respect to increasing  $p_1^{(w)}$ , variant selection weight for first degree term in allele hashing. **(b)** Impact of changing  $p_2^{(w)}$ , variant selection weight for 2<sup>nd</sup> degree term in allele hashing. **(c)** Impact of changing  $p_3^{(w)}$ , variant selection weight for 3<sup>rd</sup> degree term in allele hashing. **(d)** Impact of changing minimum number of variants used in allele hashing. **(e)** Imputation accuracy vs increasing normalized population size,  $N_e^{(w)}$ , that is used in local variant selection for hashing variants. **(f)** Imputation accuracy vs increasing window size for allele hashing,  $n_{vic}$ . **(g)** Imputation accuracy vs increasing standard deviation of genetic map distance noise,  $\sigma_g$ . **(h)** Imputation accuracy vs increasing permutation of window size for untyped variants.