Additional References


**SAS code**

*In the code below, subtype is a variable with 6 levels, where subtype=0 corresponds to controls (the referent group). SNP is a 3 level ordinal variable, age and ancestry are mean-centered continuous variables, race is a 2 level categorical variable and offset is the offset term.*

```sas
PROC MCMC DATA=data NMC=50000 NBI=1000 THIN=10 SEED=3342
  MONITOR=(var OR1 OR2 OR3 OR4 OR5 b01 b02 b03 b04 b05 b11 b12 b13
            b14 b15 b21 b22 b23 b24 b25 b31 b32 b33 b34 b35 b41 b42 b43 b44 b45);

PARMS var b01 b02 b03 b04 b05 b11 b12 b13 b14 b15 b21 b22 b23 b24 b25 b31
        b32 b33 b34 b35 b41 b42 b43 b44 b45 0; *this starting value should be arbitrary

HYPERPRIOR var~igamma(shape=4, scale=0.5); *distribution with mode at 0.1;
PRIOR b01 b02 b03 b04 b05~normal(0, var=1e6);
PRIOR b11 b12 b13 b14 b15~normal(0, var=var); *var is the hyperprior defined above;
PRIOR b21 b22 b23 b24 b25 b31 b32 b33 b34 b35~normal(0, var=0.68);
PRIOR b41 b42 b43 b44 b45~normal(0, var=1);

mu1=b01+b11*snp+b21*age+b31*ances+b41*race+offset;
mu2=b02+b12*snp+b22*age+b32*ances+b42*race+offset
mu3=b03+b13*snp+b23*age+b33*ances+b43*race+offset;
mu4=b04+b14*snp+b24*age+b34*ances+b44*race+offset;
mu5=b05+b15*snp+b25*age+b35*ances+b45*race+offset;

logl= (subtype=0)*(0-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)))
    + (subtype=1)*(mu1-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)))
    + (subtype=2)*(mu2-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)))
    + (subtype=3)*(mu3-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)))
    + (subtype=4)*(mu4-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)))
    + (subtype=5)*(mu5-log(1+exp(mu1)+exp(mu2)+exp(mu3)+exp(mu4)+exp(mu5)));

MODEL subtype~general(logl);

OR1=exp(b11);
OR2=exp(b12);
OR3=exp(b13);
OR4=exp(b14);
OR5=exp(b15);

RUN;
```