RISRIhet(loglindispersion).Rmd

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$$Y_{ij} = (\beta_0 + \mu_{0j}) + (\beta_1 + \mu_{1j})\mathbf{time_{ij}} + \beta_\mathbf{2}\mathbf{SNP_j} + \epsilon_\mathbf{ij}$$

$$\epsilon_{ij} \sim N(0, \sigma^2_{\epsilon ij})$$

$$\sigma_{\epsilon ij} = exp(\alpha + \gamma + \tau\mathbf{SNP})$$

$$\begin{bmatrix} \mu_{0j} \\ \mu_{1j} \\ \gamma_j \end{bmatrix} \sim N(0, \Omega_{\mu\gamma})$$

$$\Omega_{\mu\gamma} = \begin{bmatrix} \sigma^2_{\mu 0} & & \\ \sigma_{\mu 01} & \sigma^2_{\mu 1} & \\ \sigma_{\mu 0\gamma} & \sigma_{\mu 1\gamma} & \sigma^2_{\gamma} \end{bmatrix}$$

NOTE: I removed the ^2 in $\sigma_{\epsilon ij}$ since the function stats::rnorm takes the standard deviation not variance in the data generating process. Similarly, nlme::lme returns the SD and not the variance in modmer objects.