

$$\begin{aligned}
p(\boldsymbol{\beta}, w | \mathbf{y}) \propto & \underbrace{w^{p/2} \exp\left(-\frac{w}{2}\left(\left(\boldsymbol{\beta}-\boldsymbol{\mu}^*\right)^\top C^\top C\left(\boldsymbol{\beta}-\boldsymbol{\mu}^*\right)\right)\right)}_{\mathcal{N}\left(\boldsymbol{\mu}^*, w^{-1}\left(C^\top C\right)^{-1}\right)} \\
& \underbrace{w^{(n+d)/2-1} \exp\left(-\frac{w}{2}\left(\mathbf{y}^\top \Lambda \mathbf{y}+m^\top K m+\eta-\boldsymbol{\mu}^{*\top} C^\top C \boldsymbol{\mu}^*\right)\right)}_{\Gamma\left((n+d) / 2,\left(\mathbf{y}^\top \Lambda \mathbf{y}+m^\top K m+\eta-\boldsymbol{\mu}^{*\top} C^\top C \boldsymbol{\mu}^*\right) / 2\right)}
\end{aligned}$$

$$p(\boldsymbol{\beta} | \mathbf{y}) \propto \Gamma\left(\frac{n+d}{2}, \frac{\mathbf{y}^\top \Lambda \mathbf{y}+m^\top K m+\eta-\boldsymbol{\mu}^{*\top} \boldsymbol{\kappa}^* \boldsymbol{\mu}^*}{2}\right)$$