

## Negative binomial

```
model_nb = '  
model  
{  
  ## Likelihood  
  for(i in 1:N){  
    for(j in 1:9){  
      Y[i,j] ~ dnegbin(p[i,j],r[j])  
      p[i,j] <- r[j]/(r[j]+lambda[i,j])  
      log(lambda[i,j]) <- mu[i,j]  
      mu[i,j] <- alpha[j] + beta[j]*t[i]  
    }  
  }  
  
  ## Priors  
  for(i in 1:9){  
    alpha[i] ~ dnorm(0,taus[i])  
    taus[i] ~ dgamma(0.1,0.1)  
  }  
  
  # Slopes  
  for(i in 1:9){  
    beta[i] ~ dnorm(mu.beta,taus.beta[i])  
    taus.beta[i] ~ dgamma(0.1,0.1)  
  }  
  
  # r  
  for(i in 1:9){  
    r[i] ~ dunif(0,10)  
  }  
  
  ## Posterior Predictive Checks  
  for(i in 1:N){  
    for(j in 1:9){  
      Y2[i,j] ~ dnegbin(p[i,j],r[j])  
    }  
  }  
  
  for(j in 1:9){  
    Dm[j] <- mean(Y2[,j])  
    Dsd[j] <- sd(Y2[,j])  
  }  
  
  #Prediction  
  for(i in 1:N){  
    for(j in 1:9){  
      Yp[i,j] ~ dnegbin(pp[i,j],r[j])  
      pp[i,j] <- r[j]/(r[j]+lambdap[i,j])  
      log(lambdap[i,j]) <- mup[i,j]  
      mup[i,j] <- alpha[j] + beta[j]*t[i]  
    }  
  }  
}
```