Biology 4605/7220 Name _____
Quiz #9a 17 November 2003

The General***ized*** Linear Model allows one to use non-normal errors.
Generalized Linear models are written as follows.

Identity Link: $Response = \mu + \varepsilon$

Log Link: $Response = e^{\mu} + \varepsilon$

Logit Link: $\frac{p}{1-p} = e^{\mu} + \varepsilon$

Power Link: $Response = \mu^{k} + \varepsilon$

Response is	Canonical link is
Normal	Identity
Poisson	Log
Binomial	Logit

where μ is the systematic or structural model ($\beta_o + \beta_1 X_1 + \beta_2 X_2$ ... *etc)* ϵ is the error, and the canonical link is the link typically used with a particular error type.

1. Daniel (1995 *Biostatistics*) reported the following data for 150 carriers of a certain antigen, compared to 500 noncarriers, in relation to blood group.

Blood Group	Carriers	Noncarriers	Total	Odds	OR
O	72	230	302		
A	54	92	146		
B	16	63	79		
AB	8	15	23		

1a Compute the odds that a person is a carrier, if their blood group is A _____

1b Compute the odds ratio for blood group B, relative to blood group O _____

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2 In the following example (Daniel, 1995, p559), state whether the response variable is a binomial count or a poisson count, define a symbol for the response variable and write a generalized linear model. A researcher compares the status of 3 communities with respect to immunity against polio in preschool children. A sample of preschool children was drawn from each of the 3 communities, each child was classified by age and whether or not they were immune to polio. _____

3 In the following example (Daniel, 1995, p559), state whether the response variable is a binomial count or a poisson count. In a study of the relationship of smoking and respiratory illness, a random sample of adults was classified according to consumption of tobacco and presence or absence of respiratory symptoms. _____