
Symposium TP-2
Thursday, July 27, 2006

Effects of winning experience and testosterone on future aggressive behavior in *Peromyscus* mice

Cathy Marler



An aggressive experience can have potent effects on future aggressive behavior, but the effects may vary due to extrinsic and intrinsic factors and interactions among them. A number of environmental stimuli can influence aggressive encounters such as experience during the encounter, location, access to resources, and assessment of an opponent's fighting ability. Less well known is how such stimuli during an aggressive encounter influence future behavior, particularly ability to win future encounters. In parallel both hormonal and neural factors may vary within and between species and each of these may interact with extrinsic stimuli. We have been investigating some of these factors in *Peromyscus* mice. In the more aggressive *P. californicus* we found a strong influence of winning on future ability to win and this was accompanied by a transient increase in testosterone after an aggressive/winning encounter. Furthermore this transient increase in testosterone can directly increase aggression and future ability to win. These findings contrast with the less aggressive/territorial *P. leucopus* in which a winning encounter has a weak effect on future behavior and so far there has been no evidence of a transient increase in testosterone after a competitive encounter. We have also begun separating the experience of an aggressive encounter from the changes in testosterone and are finding that under some conditions experience alone has no effect on future behavior, but under other conditions winning without a change in testosterone can influence future behavior. In summary there are a variety of factors that may influence whether an aggressive encounter has long-term effects on future aggressive/winning behavior.