



Caption: Expression levels of IL8RB, a gene involved in the inflammatory immune response, in rhesus macaque monkeys of different dominance rankings (1 is the highest and 5 is the lowest). For each dominance rank, IL8RB expression levels are shown for 9 or 10 monkeys. Each monkey within a dominance rank was from a different social group. Scientists created social groups with one monkey from each rank. The gene expression levels are shown relative to the mean (shown as 0.0) of IL8RB expression for all 49 monkeys across all 10 groups. The trend line has a p-value of 0.003.

BACKGROUND INFORMATION

Social status in primates is known to impact many physiological conditions including disease susceptibility, fertility, and survival, with lower social status generally being a predictor of negative impacts on each of these conditions. To determine the genes underlying such physiological changes in primates of different social statuses, a team of scientists manipulated the dominance ranking of female rhesus macaques living in social groups. They did this by controlling the order in which individuals were introduced to the social group. The monkeys introduced first were perceived and treated as having the highest social status by the monkeys introduced later. The scientists set up 10 replicate social groups, each with four or five monkeys with dominance rankings of 1 through 4 or 5, with 1 being the highest rank and 5 the lowest.

The scientists collected blood samples from the monkeys and examined gene expression levels across the entire genome. Gene expression was quantified by measuring amounts of mRNA. They found that the expression levels of genes involved in immune system processes differed the most between monkeys of different ranks. This figure shows data for one of these genes, *IL8RB* (Interleukin 8 receptor, beta). The IL8RB protein (more commonly called CXCR2) is a receptor found on white blood cells. When a protein called cytokine IL8 binds to the IL8RB receptor, the white blood cell migrates to the point of infection. The migration of immune cells results in inflammation. While inflammation is a necessary part of healing, chronic inflammation has been associated with increased risk of cancer, heart disease, depression, and obesity.