Brain IL-6- and PG-dependent actions of IL-1β and lipopolysaccharide in avian fever

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We used avian cytokines to investigate a role for proinflammatory cytokines in the central component of avian fever. Inteleukins IL-1 β and IL-6 injected intracerebroventricularly into Pekin ducks (n = 8) initiated robust fevers of equal magnitude and duration, although there was a significant difference in the latency to a febrile response. In addition, the IL-1β -induced fever could be abolished with an intracerebroventricular injection of antibodies to avian IL-6 or an oral administration of a prostaglandin (PG) synthesis inhibitor. Our findings indicate the following sequence of events within the central component of the avian febrile mechanism: IL-1β gives rise to bioactive IL-6, which stimulates an accelerated synthesis of PGs, and these PGs then adjust the sensitivity of warm-sensitive neurons in the avian brain stem to mediate fever. Yet PGE_2 was not upregulated in the cerebrospinal fluid of ducks made febrile with lipopolysaccharide. We conclude that IL-1β and IL-6 may well mediate fever by instigating an accelerated synthesis of brain-derived PG, of a class other than PGE_2, or that IL-6 serves as one of the terminal mediators of the avian febrile response.