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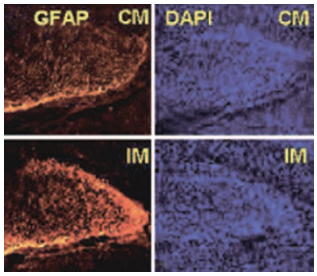
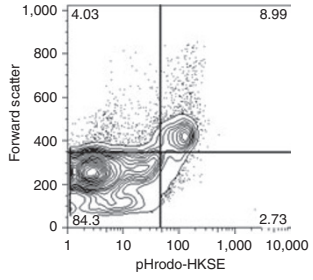
Intrauterine growth restriction and hippocampus



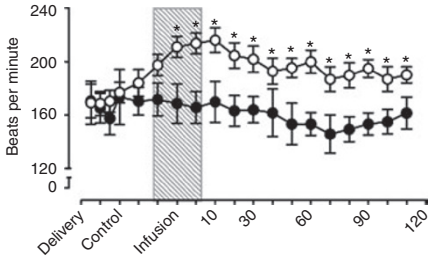
Uteroplacental insufficiency (UPI) results in numerous neurodevelopmental deficits that affect the hippocampus of intrauterine growth–restricted (IUGR) offspring, with males having greater deficiency than females. Fung *et al.* found that, as compared with sex-matched controls, IUGR rat offspring have altered cellular hippocampal composition and ErbB-receptor expression. These cellular and molecular alterations may account for the neurodevelopmental complications of IUGR and for the male disadvantage regarding neurologic outcomes. See page 2

Susceptibility to late-onset sepsis



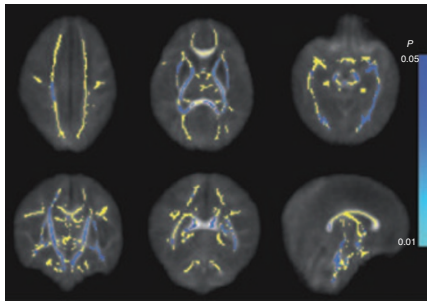
Staphylococcus epidermidis (SE) rarely causes infection in term infants but is a leading cause of late-onset sepsis in preterm infants. Cord and peripheral blood mononuclear cells from newborns of varying gestational ages were stimulated with SE, and a range of innate immune responses were assessed. The functional immaturity of monocyte-activation pathways in preterm infants may explain their susceptibility to sepsis due to commensal bacteria. See page 10

Caffeine's effect on preterm lambs



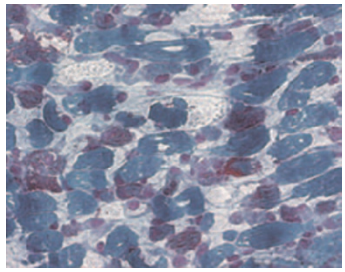
Caffeine administration is associated with a reduction in bronchopulmonary dysplasia, assisted ventilation, patent ductus arteriosus (DA), and cerebral palsy in preterm infants, but the mechanisms are unknown. Crossley and co-investigators sought to determine the effects of caffeine on renal and pulmonary function in ventilated preterm lambs. Caffeine led to an increased heart rate and urine output but had a limited effect on renal function and no acute effect on cardiopulmonary function. See page 19

Hypothermia, white-matter fractional anisotropy, and neurodevelopment



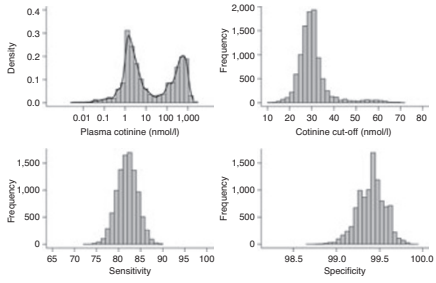
Tusor and colleagues tested the hypothesis that, in newborns treated with therapeutic hypothermia, neurodevelopmental performance can be predicted via fractional anisotropy values in the white matter on early diffusion tensor imaging (DTI). They found that DTI might serve as a biomarker with which to assess neuroprotective interventions in the newborn. See page 63

Mitochondrial DNA mutations and lactic acidosis



Mutations in heteroplasmic mitochondrial DNA (mtDNA) are an important cause of childhood disorders, but the role of homoplasmic mtDNA mutations in severe neonatal manifestations is not well known. Investigators found a G7453A mutation of mtDNA in a newborn with severe and fatal lactic acidosis. See page 90

Self-reported tobacco use during pregnancy



Uncertainty about the validity of self-reported smoking behavior is a notorious issue in epidemiologic research. Investigators from the Norwegian Mother and Child Cohort Study (MoBa) validated self-reported tobacco use against nicotine exposure assessed by plasma cotinine. In a subsample of 2,997 women who gave birth during the period 2002–2003, self-reported tobacco use was a valid marker for tobacco exposure. See page 101