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Sensory Deficits in Schizophrenia and Psychosis

Deficits in the expression of cortical oscillations in schizophrenia suggest that the neural networks generating these oscillations are not functioning optimally. **Spencer *et al.*** (pages 369–375) report that the power and phase-locking of the 40 Hz auditory steady-state oscillatory response is reduced in first-episode patients diagnosed with schizophrenia and affective disorder (mainly bipolar).

Deficits in auditory sensory gating are related to the inability to filter out irrelevant input. **Brockhaus-Dumke *et al.*** (pages 376–384) present evidence that deficits in auditory sensory gating are present in patients at risk for schizophrenia prior to the onset of the full-blown psychosis, as well as in patients in their first episode of schizophrenia prior to the onset of antipsychotic treatment. Thus, the sensory gating deficits appear to be an early sign of schizophrenia and are not a consequence of antipsychotic treatment.

Deficits in the cortical electrical response to changes in auditory input, mismatch-negativity (MMN), may be a heritable feature of schizophrenia. However, **Magno *et al.*** (pages 385–391) report that MMN was normal in first-degree healthy biological relatives and in first-episode schizophrenia patients. This finding questions the relationship between MMN deficits and the heritable risk for schizophrenia.

Quednow *et al.* (pages 434–437) provide evidence that two related variations (polymorphisms) in the gene coding for the serotonin-2A (5-HT_{2A}) receptor are related to the extent of prepulse inhibition of the startle response, a form of sensory gating, in a group of 68 patients diagnosed with schizophrenia.

Hallucinogen-Induced Changes in the Prefrontal Cortex

Celada *et al.* (pages 392–400) report that a hallucinogen, DOI, reduced the amplitude of slow oscillations in the prefrontal cortex, suggesting an important effect on the function of cortical networks. The changes produced by DOI are dependent on stimulating the 5-HT_{2A} receptor and are reversed by the antipsychotic drugs clozapine and haloperidol.

Adjunct NAC Treatment Improves Schizophrenia Symptoms

Berk *et al.* (pages 361–368) provide preliminary evidence that the addition of N-acetyl cysteine (NAC) to ongoing antipsychotic treatment improved clinical outcomes during 24 weeks of treatment. NAC may stimulate brain stores of the natural antioxidant glutathione. [See commentary by John Krystal, pages 358–360]

Imaging Evaluations of the Schizophrenic and Depressed Brain

Shibata *et al.* (pages 401–406) used a novel T1-weighted magnetic resonance imaging technique that was relatively able to detect the presence of the endogenous pigment melanin to study the integrity to two brain regions that contain high levels of this pigment, the substantia nigra and the locus coeruleus. The substantia nigra is a major center for dopamine nerve cell bodies in the brain and the locus coeruleus encompasses large numbers of noradrenergic cell bodies. The signal intensity of the substantia nigra was significantly higher in schizophrenia, while that of the locus ceruleus was significantly lower in depression. These findings suggest that there are differential changes in dopamine and norepinephrine cells in schizophrenia and depression.

Kuperberg *et al.* (pages 407–418) used functional brain imaging to examine how meaning is built from language in schizophrenia. The authors describe abnormal network activity in the processing of information that is presented out of its appropriate context (incongruous information) and concrete information.

Psychosis: Genetic Risk and Association Studies

There is quite strong evidence that the Neuregulin 1 (*NRG1*) gene plays a role in susceptibility to schizophrenia. **Georgieva *et al.*** (pages 419–427) analyzed a large family based genetic association sample of 876 trios with these disorders and found evidence that *NRG1* is a susceptibility gene for bipolar disorder as well as schizophrenia. These data also suggest that different risk variants might differentially be associated with aspects of the psychosis phenotype.

Hall *et al.* (pages 428–433) show that genetic variation in the D-amino acid oxidase activator (*DAOA*) gene, which has been associated with schizophrenia, results in alterations in brain function in individuals at risk of the disorder. In particular, risk-associated variants of the gene resulted in decreased activation of the hippocampus, a brain region implicated in psychosis.

Soronen *et al.* (pages 438–442) report on their association study of the most promising candidate genes for psychotic disorders (*DAOA*, *COMT*, *DTNBP1*, *NRG1* and *AKT1*) and bipolar disorder. The data did not reveal any strong evidence for association of the studied genes with bipolar or psychotic disorder. Instead, the nonsynonymous DAOA variant associated strongly with visuospatial ability.

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