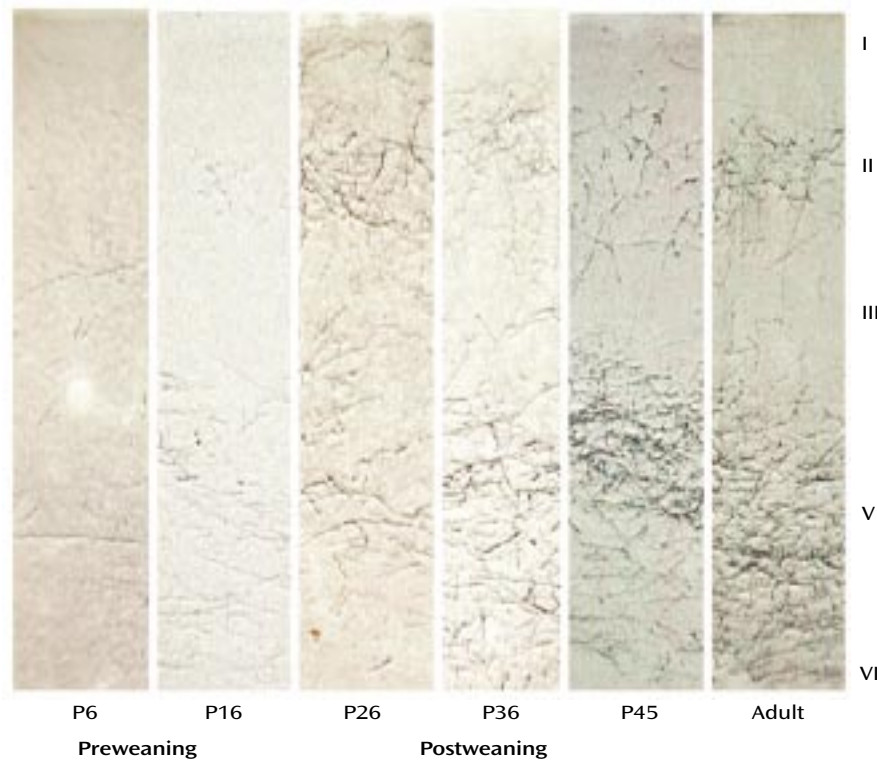


Schizophrenia, II



Amygdalar projections to the anterior cingulate cortex in rat tissue. P6, P16, P26, etc. represent the postnatal age (in days), and the Roman numerals depict each cortical layer.

Amygdalar Fiber Alteration as Etiology?

Schizophrenia is a brain disease for which much is known about the phenomenology but little of the biology. The observation that onset of schizophrenia occurs during adolescent and young adult years has driven considerable research toward identifying a biology consistent with this age at onset. Onset in adolescent/young adult years is unusual for a brain disease; usual neurodegenerative illnesses have their onset in adult/elderly ages (e.g., Parkinson's disease, Alzheimer's dementia), and typical neurodevelopmental illnesses have their onset in childhood (e.g., Rett's syndrome, fragile X syndrome, and various forms of mental retardation). Therefore, one focus of study in schizophrenia has been the identification and elucidation of neural events that occur during the adolescent/young adult years, especially normal maturational changes. Neural changes during this period probably underlie the formation of normal adult behaviors and skills; however, normal maturational events may also act as "triggers" for pathologic adolescent behavior in individuals who carry vulnerability genes for mental illness. One major change in rodent brain that takes place during the adolescent/young adult years is shown here. The tissue in the figure is from the rat anterior cingulate cortex and the projections shown are from the amygdala. In

humans, the amygdala plays a role in the regulation of affect learning that takes place in relation to the emotional and behavioral responses to stressful conditions. At birth, the connection between the amygdala and the anterior cingulate cortex (an area of the brain that processes emotion at the conscious level and regulates selective attentional responses) is quite sparse, suggesting that emotional and stress responses may be rudimentary. Throughout postnatal development, even extending into adult years, these amygdalar fibers continue to develop and increase the ability of the amygdala to regulate emotional and attentional responses in the cingulate cortex. Since the cingulate region is a limbic brain area implicated in the pathophysiology of schizophrenia, any change in the amygdalo-cingulate pathway during late adolescent years may influence the development of schizophrenia symptoms. Were we to demonstrate an alteration in this amygdalar projection to the cingulate cortex in human brain in persons with schizophrenia, it would implicate this fiber system in the etiology of the disorder.

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