

**Department of Pediatrics  
COLLEGE OF MEDICINE**

**and CINCINNATI CHILDREN'S HOSPITAL MEDICAL CENTER**

**SUMMER RESEARCH OPPORTUNITIES  
FOR UNDERGRADUATE WOMEN**

**APPLICATION DEADLINE: March 3, 2008**

The Department of Pediatrics at Children's Hospital is pleased to offer the following research project for the summer of 2008. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and if possible, develop a timetable for the twelve-week research period.

**An animal model of prenatal schizophrenia:  
Effects on the brain and behavior**

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**Project Description**

Dr. Vorhees' laboratory has investigated the effects of drugs of abuse on brain development and behavior for many years and continues to do so and projects related to this are available to students who have this interest. The studies are conducted in collaboration with the adjoining laboratory of Dr. Michael Williams. The drugs currently investigated are methamphetamine and MDMA ('ecstasy').

In addition, this summer we are moving into a new area of research. Schizophrenia is a serious CNS disease that appears during adolescence or early adulthood characterized by positive symptoms (hallucinations, delusions, inappropriate affect) and negative symptoms (inappropriate social interactions, anhedonia, and cognitive dysfunction). Once manifested, schizophrenia is an irreversible, progressive disorder that cannot be cured but can be treated but treatment is only partially effective. The cause (or causes) of schizophrenia are unknown. In the last 15 years a new theory has emerged that the disorder originates because of a prenatal injury that does not appear until later and only if triggered by a major life-stress. The basis for the theory is

epidemiological evidence find that significantly more schizophrenics are born in winter and early spring than at other time of the year. This corresponds to the peak of cold and flu season. Strengthening this association is the fact that this association only occurs if the maternal infection is during the second trimester, a period of brain development when brain structures are forming that influence the behaviors known to be abnormal in schizophrenia. Animal experiments testing this association have shown that influenza infection during the equivalent stage of rodent pregnancy leads to offspring with behavioral abnormalities that resemble symptoms of schizophrenia. Moreover, further studies have compared the effects of giving pregnant rodents influenza versus a synthetic double-stranded RNA similar to what viruses produce during infection (called Poly IC) that cause inflammation but which contains no virus. The findings show that it is the maternal inflammatory response and not the virus itself that leads to behavioral abnormalities in the progeny. In collaboration with faculty in the Dept. of Psychiatry we are setting up this model in order to investigate the mechanism by which Poly IC damages the developing brain. In order to do this we must first establish the model and show that we can obtain the same effects as others. This summer we will be treating animals prenatally and testing their offspring for schizophrenic-like changes to determine how reliable this model is. Students working in the lab will be involved in the extensive behavioral testing required to determine the effects of prenatal Poly IC treatment.