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CANADIAN GENETIC DISEASES NETWORK

GENE RESPONSIBLE FOR 'CYCLOPS' SYNDROME DISCOVERED BY CANADIAN SCIENTISTS

Toronto - November 1, 1996: A team lead by Network scientists Dr. Lap-Chee Tsui and Dr. Stephen Scherer, together with Dr. Elena Belloni at the Toronto Hospital for Sick Children has identified a gene which causes a devastating disease called holoprosencephaly (HPE3). The disorder, which affects development of the forebrain and midface in the unborn infant, is caused by mutation in a gene called 'sonic hedgehog' (SHH), which is the first known gene to cause holoprosencephaly.

Usually leading to mortality after birth, HPE3 arises due to complete failure of division of the forebrain into right and left hemispheres and commonly results in cyclopia, the formation of a single eye in the centre of the face, and the absence of a mature nose. More mild symptoms of HPE3 include defects of the upper lip and/or nose. The incidence of the disorder is 1 in 16,000 live births.

The results of the research, carried out in collaboration with scientists at the University of Toronto, the University of Victoria, and in the United States and France, are described in two papers published in the November 1 issue of the scientific journal *Nature Genetics*.

Although SHH has been well characterized in other organisms and is known to occur in virtually every animal species, this is the first time a link between the gene and HPE3 has been established in humans. "Not only did Homer refer to cyclopia, but it's mentioned in the writings of the early Romans",

explains Dr. Scherer, a molecular biologist at the Hospital for Sick Children. "If based on fact, these accounts represent the earliest documentation of survivors of the severe form of holoprosencephaly."

SHH is located on human chromosome 7 and is one of at least four different loci implicated in familial holoprosencephaly. Commented Dr. Tsui, Principal Investigator with the Canadian Genetic Diseases Network and Chief Geneticist at HSC, "The Canadian Genome Analysis and Technology Program (CGAT) and our team's advanced gene map of chromosome 7 have been highly instrumental in the success of this project; however," he added "funding assistance from the Canadian Genetic Diseases Network has been crucial to our efforts in clinical material collection and will continue to be essential to our ongoing research."

Commented Dr. Michael Hayden, Scientific Director of the Canadian Genetic Diseases Network "I congratulate Dr. Tsui and Dr. Scherer and their team on these outstanding scientific results. The identification of the HPE gene is a step toward better understanding normal and abnormal brain development in humans and is an excellent example of the scientific benefits accruing to Canada through the federal Networks of Centres of Excellence program."

The Canadian Genetic Diseases Network is a consortium of 38 of Canada's leading geneticists who are linked with 11 universities, 8 hospitals, and 9 core facilities across the country. The Network performs leading-edge research on common genetically transmitted diseases and works with industry partners on methods of detection and treatment of the diseases. Core funding for Network programs is provided by the federal Networks of Centres of Excellence Program through the Medical Research Council of Canada.

For further information contact:
Carol Smith, Network Manager
Canadian Genetic Diseases Network
Tel. 604-822-7217/7886