These results will be published in the on-line edition of the prestigious journal *Environmental Health Perspectives.*

Hairspray is linked to common genital birth defect

The study was carried out in the UK and coordinated by the Imperial College London, with the participation of the Centre for Research in Environmental Epidemiology (CREAL) in Barcelona and University College Cork.

Barcelona, 21st November 2008. The study is the first to show that women who are exposed to hairspray in the workplace during the first trimester of pregnancy have more than double the risk of having a son with the genital birth defect hypospadias.

Hypospadias is one of the most common birth defects of the male genitalia, where the urinary opening is displaced to the underside of the penis. The cause of this is phthalates, present in most hairsprays, which are substances that are associated with a drop in androgen activity causing genital defects like hypospadias. Phthalates are a group of chemical compounds that are usually added to plastics to increase flexibility and are present in other products such as cosmetics and electric cables.

According to **Mark Nieuwenhuijsen, CREAL researche**r and one of the authors of the study: *"This is the most comprehensive study on hypospadias that has been carried out and the first to show a significant link between hairspray and hypospadias."* The new study may also have implications for other reproductive problems in addition to hypospadias, say the researchers. It has recently been proposed that hypospadias, undescended testes, poor semen quality and some types of testicular cancer are symptoms of an underlying problem with the way the testicles develop in the uterus.

It is thought that hypospadias affects around 1 in 250 boys in the UK and in the USA, and 1 in 150 boys in Spain, although estimates about prevalence vary. Usually, hypospadias can be successfully treated with corrective surgery after a boy reaches his first birthday, but more severe cases can lead to problems with urinating, sexual relations and fertility.

The new research also reveals that taking folic acid supplements in the first three months of pregnancy is associated with a 36 percent reduced risk of bearing a child with the condition. Doctors already recommend that folic acid supplements are taken up until the twelfth week of pregnancy in order to prevent neural tube defects such as spina bifida.

Previous smaller studies had suggested that hypospadias might be linked to vegetarianism but the new study did not show any increased risk in women who had a vegetarian diet during pregnancy.

Professor Paul Elliott, the corresponding author of the research from the Department of Epidemiology and Public Health at Imperial College London, said: *"Hypospadias is a condition that, if left untreated, can cause problems in later life. Although surgery to correct it is usually successful, any surgery will*

be traumatic for the child and his parents. It is encouraging that our study showed that taking folic acid supplements in pregnancy may reduce the risk of a child being born with the condition."

The researchers reached their conclusions after conducting **detailed telephone interviews with 471 mothers** whose sons had been referred to surgeons for hypospadias and **490 controls,** across **120 London Boroughs and Local Authority Districts**. The questionnaires explored a range of aspects of the women's health and lifestyle: the mother's occupation and possible exposure to different chemical substances, family history of disease, maternal occupation, vegetarianism, smoking and use of folic acid supplements. Women who had exposure to hairspray in the workplace included office workers, flight attendants and financial consultants and those working in hairdressing and beauty therapy, research chemists and pharmaceutical operators. The study was funded by a grant from the UK Department of Health.

However in light of these results, further study is needed to understand better why women exposed to hairspray at work in the first 3 months of pregnancy may have increased risk of giving birth to a boy with hypospadias. Measuring phthalate exposure and/or biomonitoring may help us understand exposure possibilities and toxicity levels. In addition, the protective role of folic acid in relation to this defect may have important implications on public health and prevention.

Reference Article

"**Endocrine Disruptors in the Workplace, Hair Spray, Folate Supplementation, and Risk of Hypospadias: Case-control Study," Environmental Health Perspectives**

About Imperial College London

Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 12,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment - underpinned by a dynamic enterprise culture.

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About CREAL

CREAL is a joint initiative together with the Municipal Institute of Medical Research (IMIM-Hospital del Mar), Pompeu Fabra University (UPF) and the Generalitat of Catalonia. Despite its recent creation in 2005, this centre has inherited a line of environmental epidemiological research initially promoted by the IMIM Respiratory and Environmental Health Research Unit (URRA- *Unidad de Investigación Respiratoria y Ambiental*). Thus, its research staff has extensive experience in information systems research and advising, environmental risk assessment and crisis management, as well as in environmental epidemiology methods training and knowledge management. Director: Josep Maria Antó. www.creal.cat

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