

## The ENVIR.REPROD.HEALTH Project:

# Increasing incidence of human male reproductive health disorders in relation to environmental effects

*During the last decades, numerous observations on adverse trends in male reproductive health have been reported. These worrying trends include the rising incidence of testicular cancer, low and probably declining semen quality, high and possibly increasing frequencies of cryptorchidism (undescended testis) and malformations of the penis (hypospadias) as well as a growing demand for assisted reproduction.*



### Objectives

The general objectives of this project were:

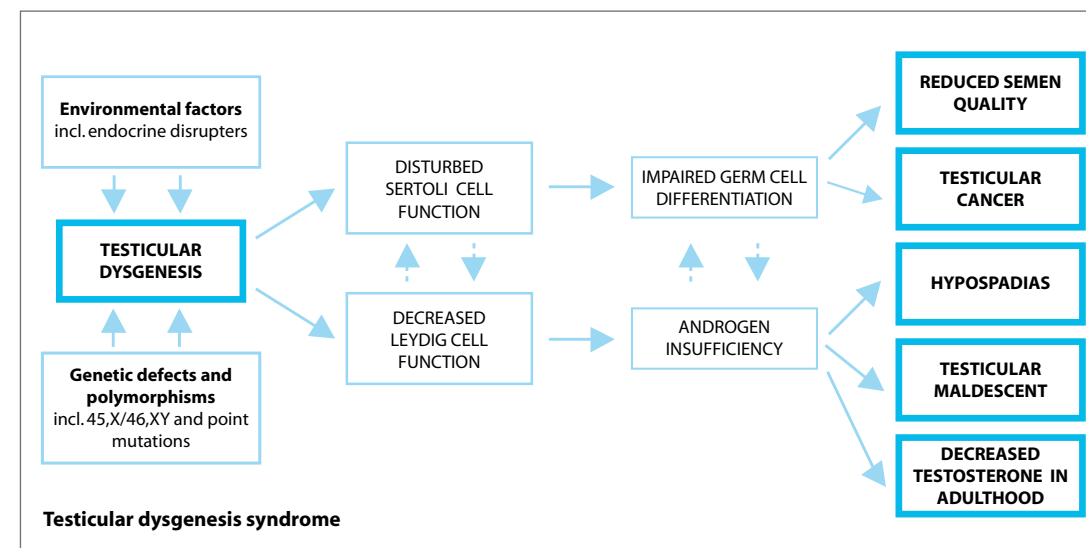
- to establish the status of infant and adult male reproductive health in Europe;
- to identify potential environmental causes for adverse trends in male reproductive health;
- to identify mechanisms of action of environmental chemicals on reproductive development; and
- to evaluate non-invasive methods for detection of environmental exposure;
- We have utilised differences in incidence of reproductive disorders between participating EU countries and experimental animal models as the main paths to search for association between environmental factors and adverse male reproductive health outcomes.

### Key findings and conclusions

- Significant differences in sperm quality in the participating countries exist. In Northern

Europe, a west-east gradient seems to exist with Danish and Norwegian men exhibiting lower sperm concentrations than Swedish men, who in turn have poorer sperm quality than men from the Baltic countries and Finland. The contrast between Denmark and Finland is striking, which also is reflected in the incidence of testicular cancer in the two countries. Environmental factors that might explain this difference will be explored;

- Standardised Danish and Finnish mother-child cohorts demonstrated that the incidence of congenital malformations of the male genitalia is much higher in Danish newborn boys than in Finnish ones – another indication that male reproductive health is worse in Denmark compared to Finland. Mother-child cohorts in



U.K., Spain and France are also being followed up, which will provide more information on regional variation in congenital malformations of the male genitalia;

- Country differences between Danish and Finnish boys were also observed at 3 months of age for testicular size and in the level of serum inhibin B; a serum marker of Sertoli cell function;
- Clinical and biochemical data, medical history and questionnaire data on life-style factors collected in a central database are currently being analysed for possible risk associations;
- Based on the clinical and epidemiological associations between different male reproductive disorders, the hypothesis of a testicular dysgenesis syndrome (TDS) has been proposed, which may serve to explain the observed associations.

### Relevance and contribution to EU policy

Chemical analyses of a range of environmental compounds with suspected or known endocrine disrupting activity are currently carried out on biological samples collected in the mother-child cohorts. Results will be related to the clinical and biochemical findings. The chemical analyses have been funded by the European Commission.

Analysis of the immense data set collected in the central European database on male reproductive

health and in the mother-child cohorts' database will continue. The results are relevant for several EU policies including the REACH regulation in chemicals and the EU strategy on Endocrine Disrupters.

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#### Project acronym

ENVIR. REPROD.HEALTH

#### Contract number

QLK4-CT-1999-01422

#### FP5 Thematic Programme

Quality of Life and Management of Living Resources

#### Duration

66 months (2000-2005)

#### EC contribution

€ 2 700 000

#### Website

<http://www.reproduction.dk/>

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