

**Board of examiners****Prof. Claus Gravholt**

Department of Endocrinology and Internal Medicine  
Aarhus University, Denmark

**Prof. Sjoerd Repping**

Centre for Reproductive Medicine  
University of Amsterdam, The Netherlands

**Prof. Martine Cools**

Division of Pediatric Endocrinology, Department of Pediatrics  
Universiteit Gent

**Prof. Maryse Bonduelle**

Department of Medical Genetics  
Vrije Universiteit Brussel

**Prof. Dirk Michielsen**

Department of Urology  
Vrije Universiteit Brussel

**Prof. Yvan Vandenplas, Chair**

Department of Pediatrics  
Vrije Universiteit Brussel

**Promotors****Prof. Jean De Schepper****Prof. Herman Tournaye,**

Division of Pediatric Endocrinology, Department of Pediatrics  
Centre for Reproductive Medicine  
Vrije Universiteit Brussel

PhD in Medical Sciences  
2015-2016

INVITATION to the Public defence of

**Inge GIES**

To obtain the academic degree of '**DOCTOR IN MEDICAL SCIENCES**'

**Exploring the conditions for fertility preservation in adolescents with Klinefelter syndrome.****Thursday 24 March 2016**

Auditorium **3**, 17:00

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

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Vrije Universiteit Brussel

## Summary of the dissertation

Klinefelter syndrome (KS), first described in 1942, and characterized by one or more additional X chromosomes in males, leads to a progressive testicular failure causing small firm testes, androgen deficiency, and azoospermia. In more than half of adult azoospermic KS men, testicular spermatozoa can be retrieved by testicular sperm extraction (TESE). Since germ cell depletion starts with the onset of puberty, peripubertal testicular tissue sampling might offer the possibility of a higher chance in preventing sterility.

We therefore examined the prevalence of spermaturia during adolescence in KS individuals and the outcome of sperm collection by masturbation, vibro-or electro stimulation and/or TESE under general anesthesia, when early clinical and/or hormonal signs of testicular damage were observed. In none of the seven investigated KS adolescents spermatozoa were retrieved, while in 4 patients, spermatogonia were identified at histological examination. Massive fibrosis and hyalinization was observed in all biopsies. None of the studied standard clinical or hormonal parameters of testicular function were of value in determining the presence of spermatogonial stem cells (SSC).

We also developed a questionnaire on the views and attitudes of KS parents as well as general pediatricians towards experimental fertility preservation techniques, and demonstrated that the majority of both groups were in favor of early detection and cryopreservation of spermatozoa or SSCs after TESE. Furthermore, almost all participants agreed on neonatal screening for the syndrome in order to improve the clinical as well as fertility outcome of the patients.

In conclusion, we showed that the success rates of retrieval of SSCs in both early and late pubertal KS patients are equal to the numbers found in adult KS patients. Despite the eagerness of parents and caregivers to prevent sterility in these boys, to date no clinical or hormonal biomarkers exist to predict the outcome of TESE at any age.

## Curriculum Vitae

Inge Gies was born on December 20th 1976 in Ukkel, Belgium. She studied Latin-Modern Languages at the Sint-Victor Institute, Alsemberg, and afterwards went to medical school at the Vrije Universiteit Brussel (VUB), Belgium, where she obtained her medical degree with great distinction in June 2001. She successfully completed here residency in Pediatrics at the VUB in 2006. Afterwards, she continued her education in Pediatric Endocrinology at the UZ Brussels Children's Hospital under the supervision of Prof. Dr. J. De Schepper. Since 2012, she coordinates the Pediatric Klinefelter Clinic in the University Hospital Brussels, and started at the same time her PhD on this topic under the surveillance of Prof. Dr. J. De Schepper and Prof. Dr. H. Tournaye. She is also a clinical tutor within the pediatric course at the Faculty of Medicine at the Vrije Universiteit Brussel, and (co-)authored over 15 papers in the field of pediatric endocrinology, diabetes and obesity.