



## Uniparental Disomy of Chromosome 14 OMIM #608149

### INTRODUCTION

Uniparental disomy (UPD) is the abnormal situation in which both copies of a chromosome pair are inherited from only one parent, with no copies inherited from the other parent. UPD has been observed to result through several mechanisms including trisomy rescue and gametic complementation, and from the presence of structurally abnormal chromosomes, including Robertsonian translocations.

Uniparental disomy of chromosome 14 (UPD14) results in one of two distinct abnormal phenotypes depending on the parent of origin, although phenotypes can be variable:

**Maternal UPD:** pre- and postnatal growth retardation, precocious puberty, hypotonia, mild developmental delay although intelligence can be normal, obesity, hyperextensible joints, macrocephaly, and scoliosis.

**Paternal UPD:** More severe phenotype than maternal UPD 14 with polyhydramnios, skeletal abnormalities that result in short-limb dwarfism, narrow thorax and associated respiratory difficulty and decreased survival, dysmorphic facies with small ears, short palpebral fissures and long philtrum, moderate to severe mental retardation, and scoliosis.

The discordance between maternal and paternal UPD phenotypes may be due to reciprocal over and under-expression of one or more imprinted genes on 14q. A cluster of imprinted genes including *DLK1* and *MEG3* has been identified and localised to 14q32.

UPD for chromosome 14 usually involves the entire chromosome, however there have been reports describing cases of segmental disomy 14 and several cases of *DLK1* deletions resulting in both the maternal and paternal phenotypes.

Confirming a diagnosis of UPD14 is important as:

- Management of the syndrome requires that differential diagnoses are excluded
- A predisposing parental chromosomal rearrangement can be excluded which significantly reduces the recurrence risk

**REFERRALS:** Only accepted from Clinical Genetics

### TESTING

Diagnostic testing:

- Clinically affected individuals
- Affected individuals with cytogenetically identified Robertsonian translocations involving chromosome 14

Prenatal testing, where possible arranged in advance:

- Fetus at risk of UPD14 through inheritance of a structurally abnormal chromosome from a balanced Robertsonian translocation carrier
- Fetal sample shown to have a chromosome 14 derived marker chromosome or mosaicism for chromosome 14 trisomy and therefore at risk of UPD14

### STRATEGY AND TECHNICAL INFORMATION

- Microsatellite marker analysis (parental samples are required and will be requested prior to analysis)
- The sensitivity of this test is unknown, but will be dependent on the availability of family members, the informativity of individual families and the location of informative markers, in cases of segmental UPD.

### TARGET REPORTING TIMES

Diagnostic testing: 10 days  
Prenatal testing (includes maternal contamination check): 3 days

**N.B. Details are correct for the date of printing only – last updated 01/09/2015**