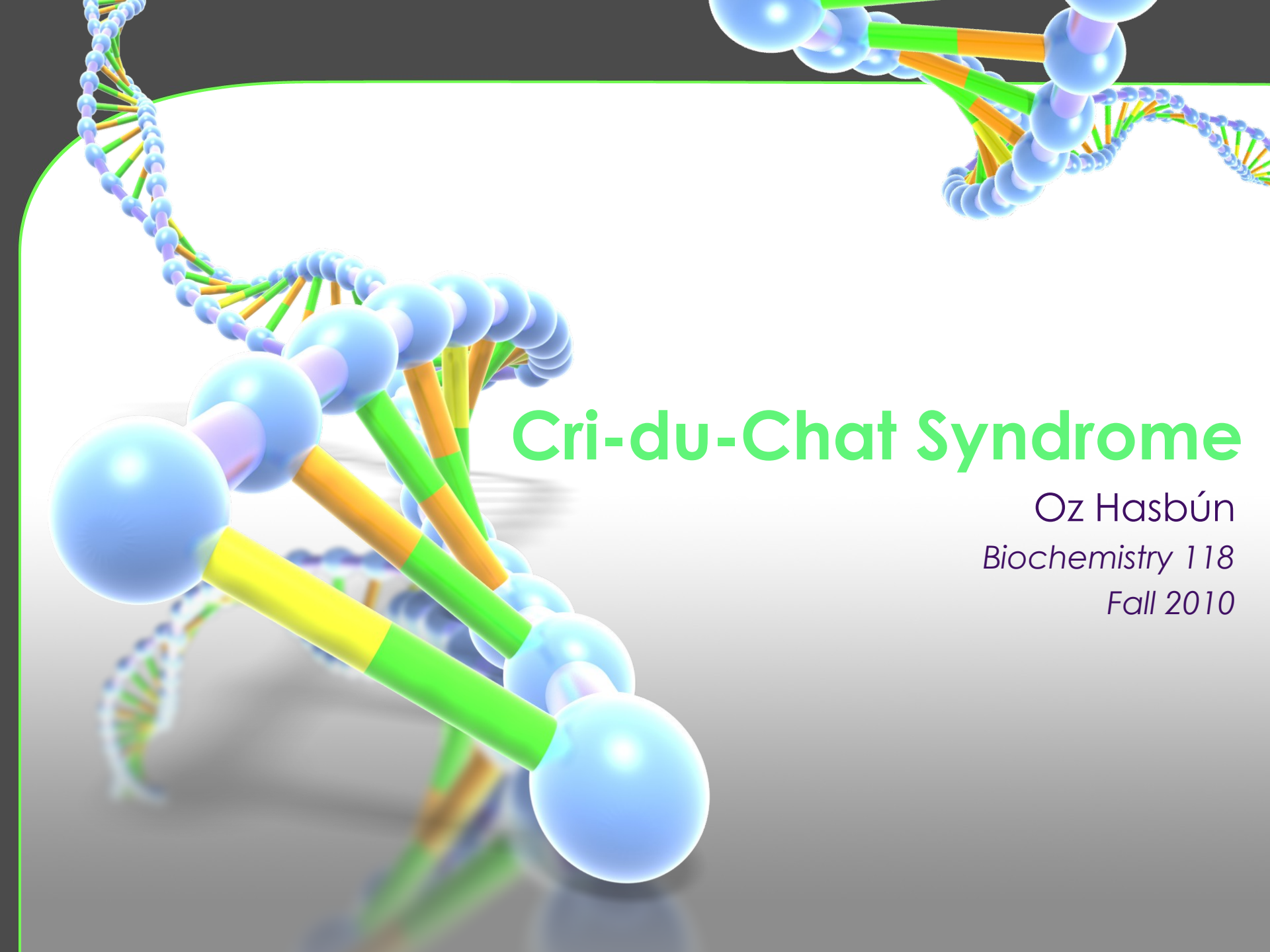

Cri-du-Chat Syndrome

Oz Hasbún

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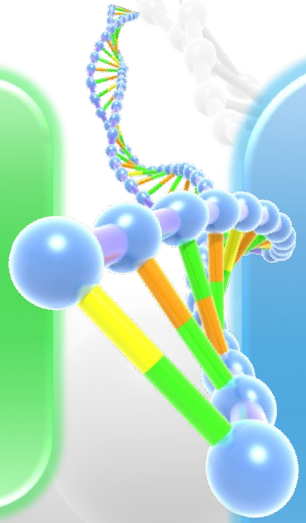
What is Cri-du-chat Syndrome?

- Cri-du-chat syndrome, also known as 5p- (5p minus) syndrome, is a hereditary, congenital condition of partial aneusomy resulting from deletion of the short arm of chromosome 5.

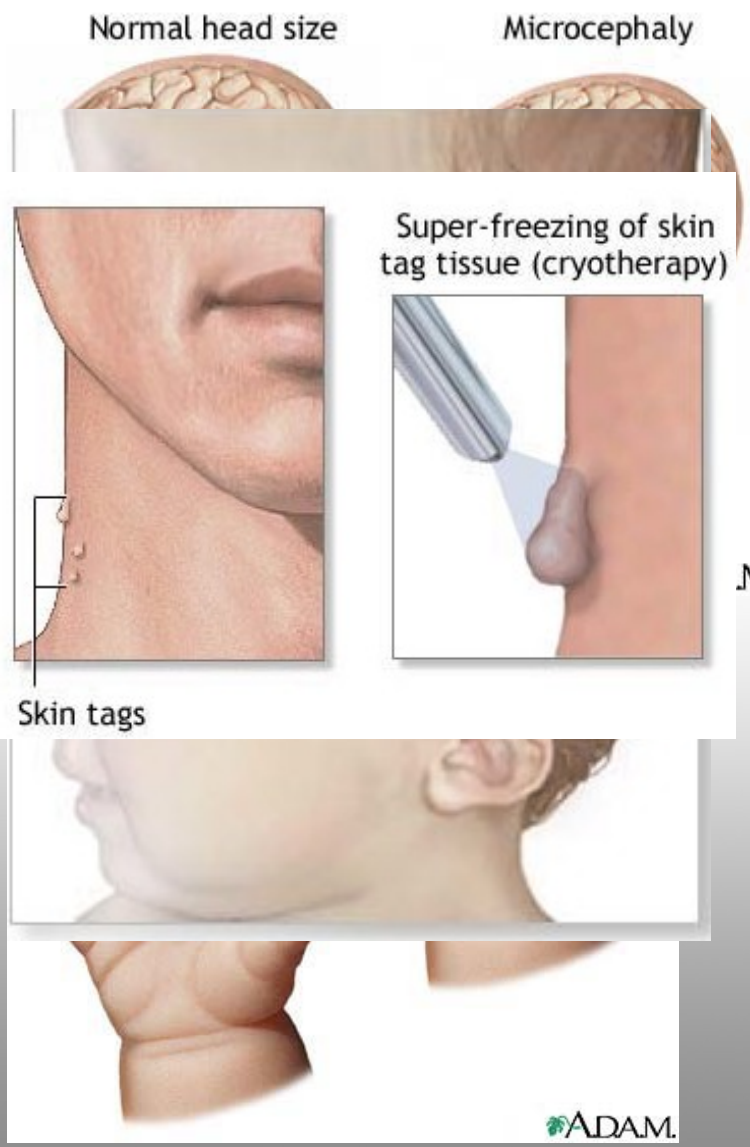
Cri-du-chat (cat's cry) Syndrome acquires its name from the characteristic high-pitched cry of affected infants that sounds like that of a cat.



Approximately 12% of the deletions result from unbalanced segregation of translocations/ recombination involving a pericentiric inversion in one of the parents.

Deletions vary in size; some include only band 5p15.2, while others the entire short arm. Larger deletions tend to result in more severe intellectual disability and developmental delay.

Classical Signs & Symptoms (S & Sx)



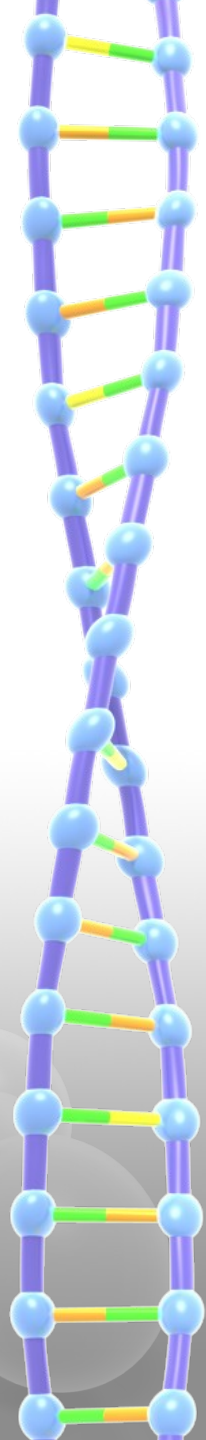
- Microcephaly
- Rotund face
- Hypertelorism
- Micrognathia
- Epicanthal folds
- Simian Crease
- Low-set ears (pinna)
- Skin tags in front of ear
- Mental retardation/delayed development
- High-pitched cat-like cry (Same cry is seen in patients with a deletion confined to 5p15.3 and without the typical dysmorphic and severe developmental features of the syndrome).

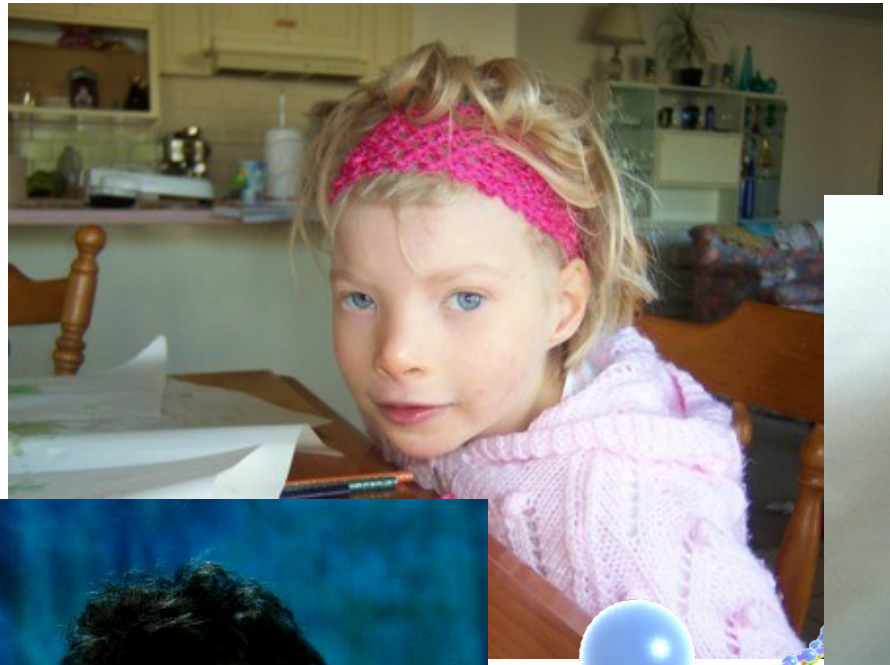
S & Sx Cont. & Diagnosis

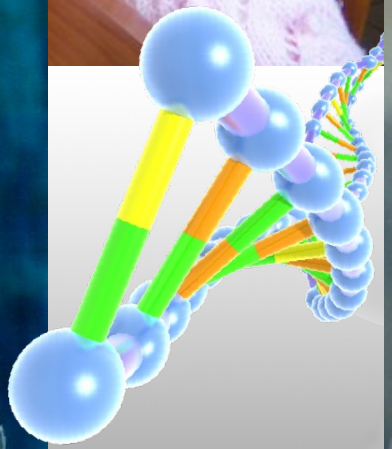
In addition to symptoms, the physical examination may show:

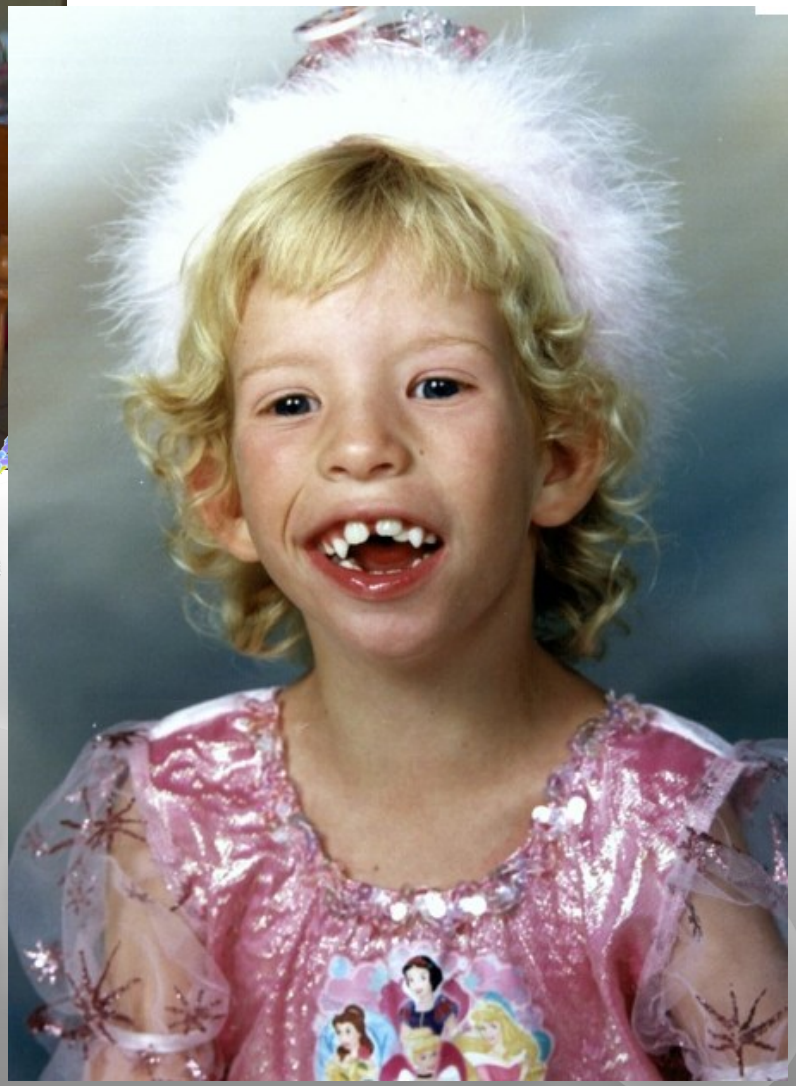
- Inguinal hernia
- Diastasis recti (separated abdominal muscles)
- Hypotonia, which affects psychomotor function

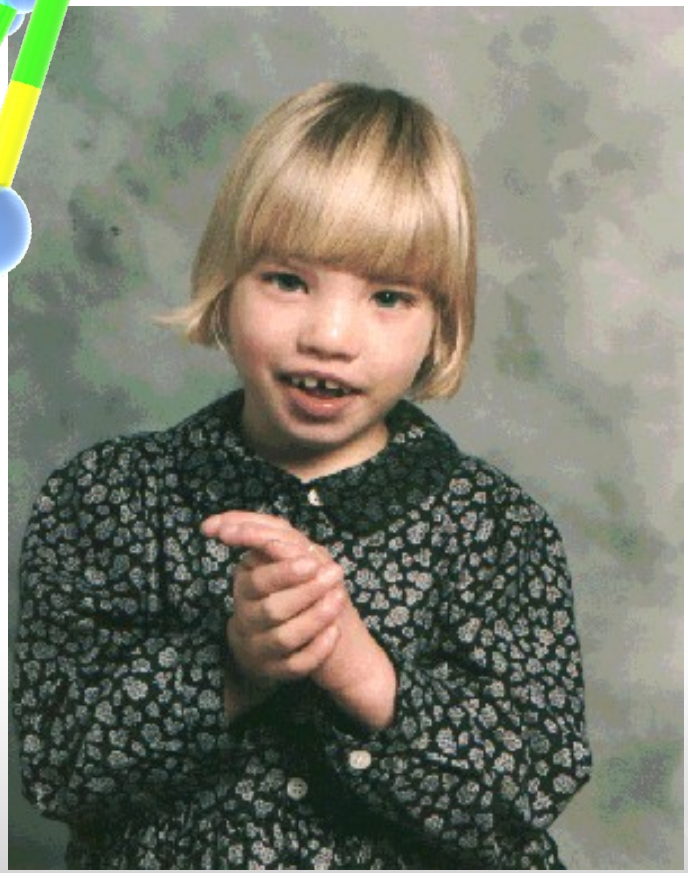
- Genetic testing, such as array comparative genomic hybridization to map DNA copy number change, can show deletions on chromosome 5, as well as the extent of the deletion and therefore possible severity/ prognosis.
- Cri-du-chat Syndrome seems to be one of the most common human deletion syndromes, with an incidence varying between 1 in 20,000 to 1 in 50,000 births. The frequency of the syndrome in populations of severely mentally retarded patients with IQs <20 is around 1%.





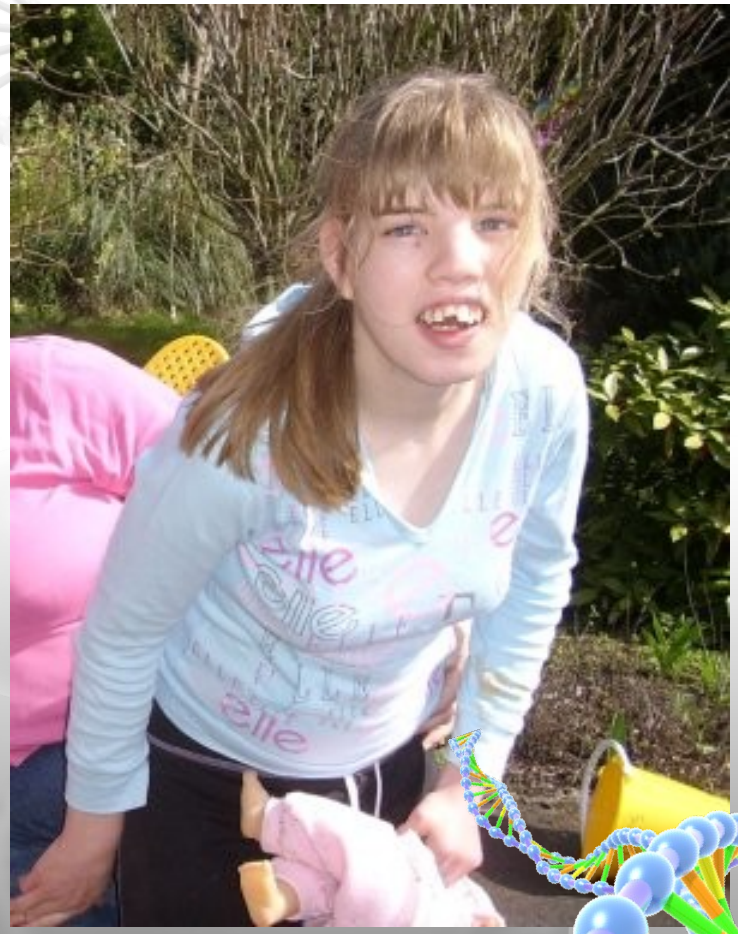




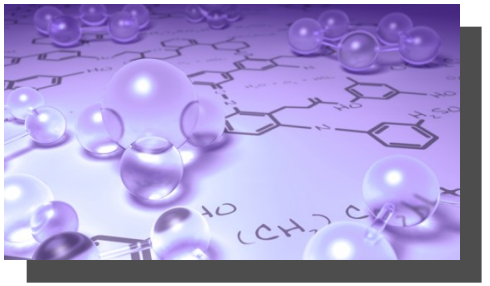


At age of six

At age of sixteen



Molecular Genetics



- Cri-du-chat has complex molecular genetics mostly revolving around the length of the deletion in chromosome 5 as well as where the deletion occurs on the chromosome.
- The deletion occurs most often as a random event during the formation of reproductive cells (eggs or sperm) or in early fetal development.
- Only about 10 percent of people with Cri-du-chat Syndrome inherit the chromosome abnormality from an unaffected parent.
- In these cases, the parent carries a chromosomal rearrangement called a balanced translocation (asymptomatic), in which no genetic material is gained or lost.
- Children who inherit an unbalanced translocation can have a chromosomal rearrangement with extra or missing genetic material. Individuals with Cri-du-chat Syndrome who inherit an unbalanced translocation are missing genetic material from the short arm of chromosome 5.

Molecular Genetics

- A critical chromosomal region involved in the high-pitched cry mapped to proximal 5p15.3.
- The chromosomal region involved in the remaining features of the syndrome mapped to a small region within central 5p15.2.
- Deletions that did not include these 2 chromosomal regions presented varying clinical phenotypes from severe mental retardation and microcephaly to a clinically normal phenotype.
- The CTNND2 gene maps to a specific region in chromosome 5p15.2 implicated in the mental retardation phenotype. There is a strong correlation between hemizygous loss of CTNND2 and severe mental retardation.
- The properties of CTNND2 as a neuronal-specific protein, expressed early in development and involved in cell motility, supports its role in mental retardation when present in only 1 copy.

Treatment & Therapies

- No specific treatment is available for this syndrome, but detection is definitive with genetic mapping.
- There is no known prevention.
- The mental retardation can be treated with special education and professional aid, and counseling is recommended for the parents.
- What can be expected varies, but mental retardation is usual.
- Half of children with Cri-du-chat syndrome learn sufficient verbal skills to communicate. The cat-like cry becomes less apparent over time.
- Couples with a family history of this syndrome who wish to become pregnant may consider genetic counseling.
- Genetic testing at time of birth would determine whether a child had the syndrome and to what degree. The location of the deletion in chromosome 5 would also allow for a fairly accurate prognosis with which the parents can develop a plan for therapy.

References

http://www.nlm.nih.gov/medlineplus/ency/imagepages/17226.htm

http://www.nlm.nih.gov/medlineplus/ency/article/001593.htm

http://ghr.nlm.nih.gov/condition/cri-du-chat-syndrome

http://www.ncbi.nlm.nih.gov/omim/123450#ClinicalFeatures-123450

Images acquired from Google Image Search of Cri-du-chat Syndrome.