Inherited disorders result in dental anomalies

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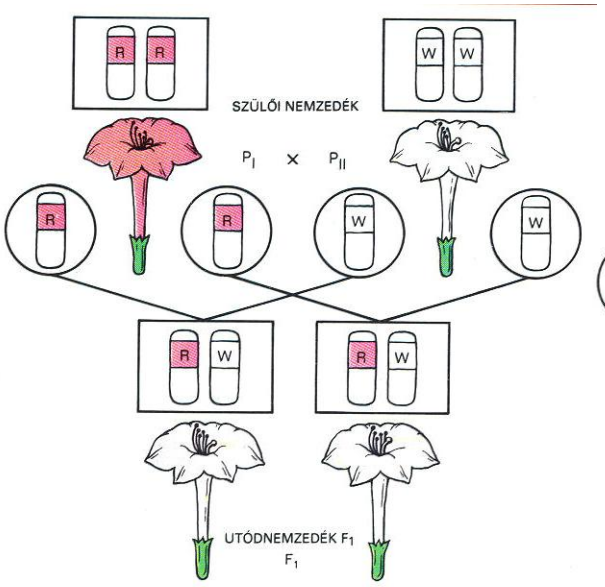
Anomalies

- **inherited (genetic) → mutation**
- **acquired → harms**
  - **abnormalities of placenta**
  - **radiation**
  - **medication**
  - **virus infections (rubeola, influenza)**

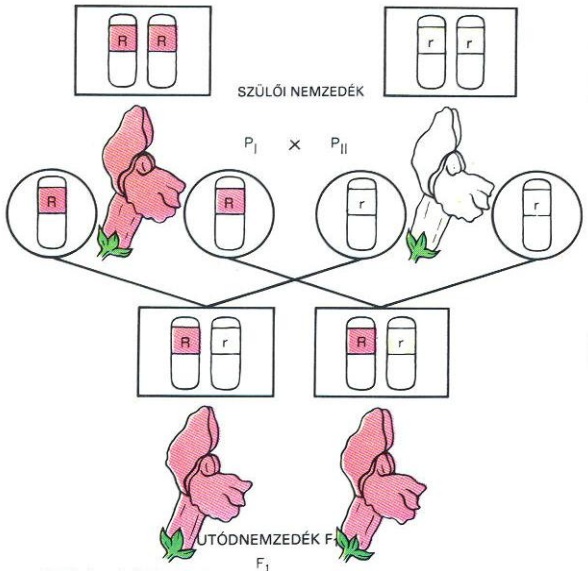
Genetics

Mendel

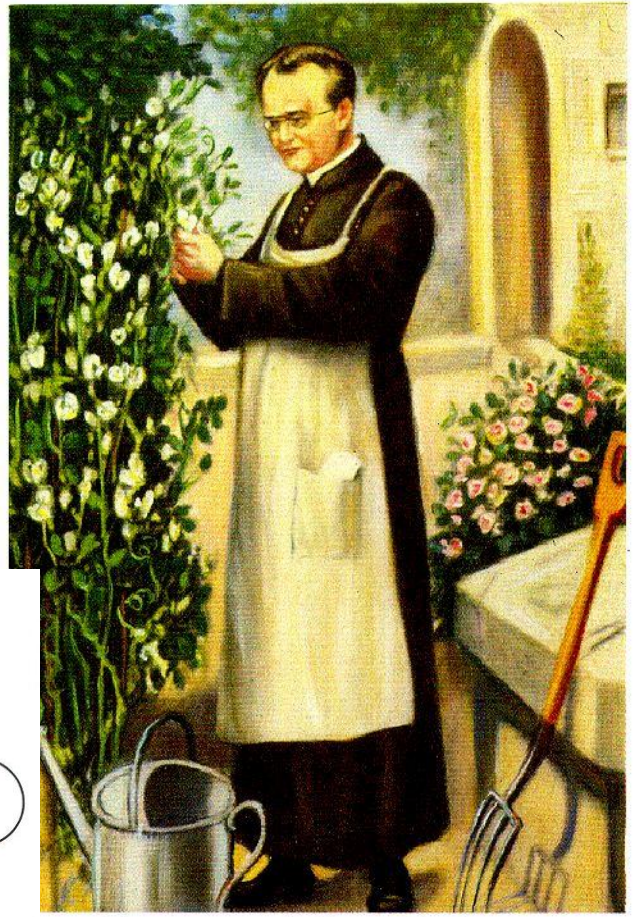
- forming of the science of genetics
- 1865
- today: Mendelian lows of heredity
- he examined 22 different types of pea



intermedier öröklésmenet
nagy csodatölcsér



domináns öröklésmenet
oroszlánszáj



Gregor Mendel

Genetic disorders

3 groups:

- **anomalies caused by harms of 1 gene (locus)**
  - **autosomal (dominant, resessive)**
  - **X-linked (dominant, resessive)**
- multifactorial inherited anomalies
- chromosome aberrations

Autosomal dominant inheritance

1. **Scheuthauer-Marie-Sainton syndrome** (dysostosis cleidocranialis)
2. **Osteogenesis imperfecta**
3. **Crouzon syndrome**
4. **Apert syndrome**
5. **Treacher Collins-Franceschetti syndrome** (dysostosis mandibulofacialis)
6. **Gardner syndrome**
7. **Waardenburg I. syndrome**
8. **Marfan syndrome**

Autosomal dominant inheritance

1. **Scheuthauer-Marie-Sainton syndrome**

   (Marie and Sainton P, 1898.)

   (dysostosis cleidocranialis)

   ⬇

   general dysplastic bone formation manifested in typical malformations in skull, pelvis and thoracic region

   (abnormal ossification ➡ persistence of sutures for years or for life)

   prevalence: 1: 1.000.000

Autosomal dominant inheritance

1. **Scheuthauer-Marie-Sainton syndrome**

   (dysostosis cleidocranialis)

   General symptoms:

   - short stature
   - ankylosis
   - absent or hypoplastic clavicules (hypermobility of shoulders)

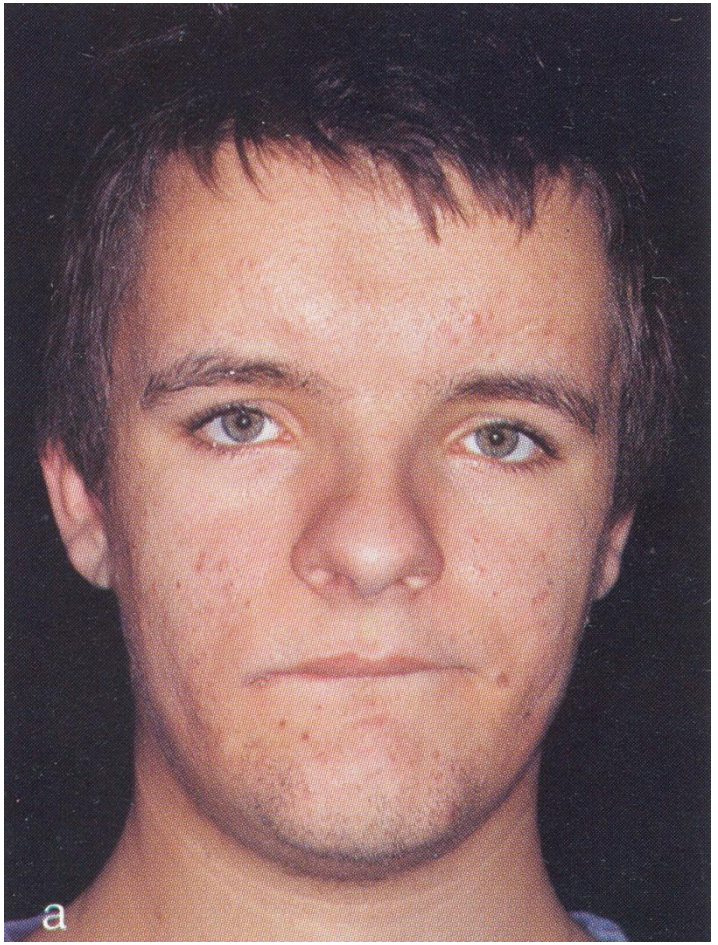
Autosomal dominant inheritance

1. **Scheuthauer-Marie-Sainton syndrome**

   (dysostosis cleidocranialis)

   Symptoms:

   - large, broad and short cranium (macrocephalus, brachycephalus)
   - frontal and paritel bossing
   - broad and depressed nasal bridge
   - nem légtartó sinusok
   - hypoplastic midface
   - relative progenia



Autosomal dominant inheritance

1. Scheuthauer-Marie-Sainton syndrome

Dental symptoms:

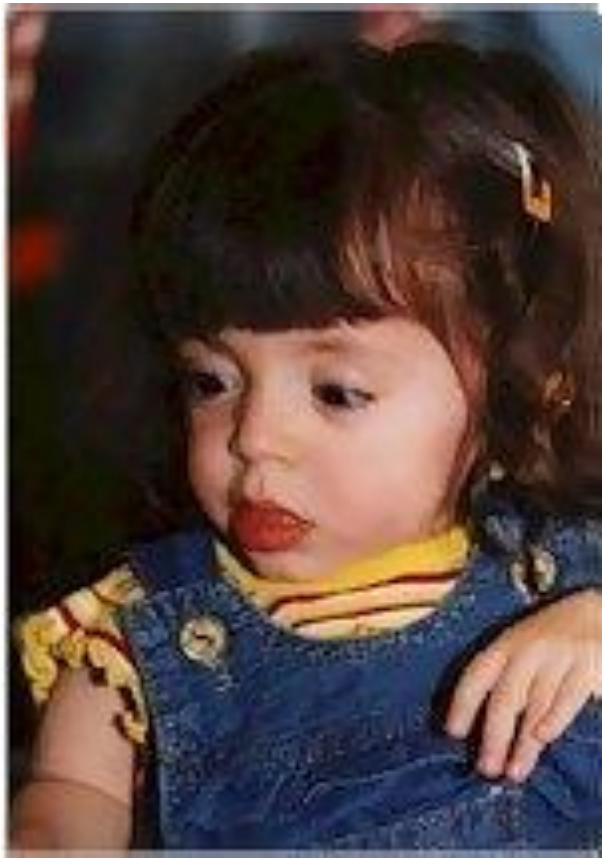
- high and narrow palate (with or without cleft palate)
- supernumerary teeth
- delayed eruption
- crowns and roots are in abnormal localisation
- teeth in retention are in ectopic places
- extremely long-lasting second dentition

Autosomal dominant inheritance

2. Osteogenesis imperfecta

- complex harm of connective tissue (collagen)
- it is characterized by bones that break easily
- 4 types:

type I – „mild”
type II – lethal
type III
type IV
} - severe

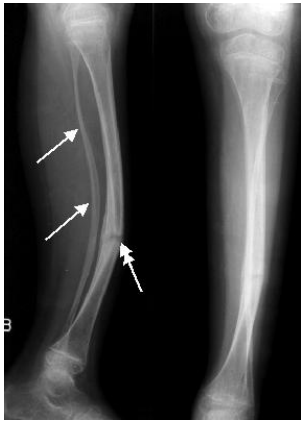


Autosomal dominant inheritance

2. **Osteogenesis imperfecta Type I (mild)**

   Symptoms:

   - problems with the production of collagen Type I (collagen structure is normal, but the amount is less than normal)
   - bones break very easily
   - ossification is quick after fracture, but not normal



Autosomal dominant inheritance

2. **Osteogenesis imperfecta**
   Type I (mild)

   Symptoms:

   - normal or near-normal stature
   - blue sclera
   - hearing loss
   - dentinogenesis imperfecta

Autosomal dominant inheritance

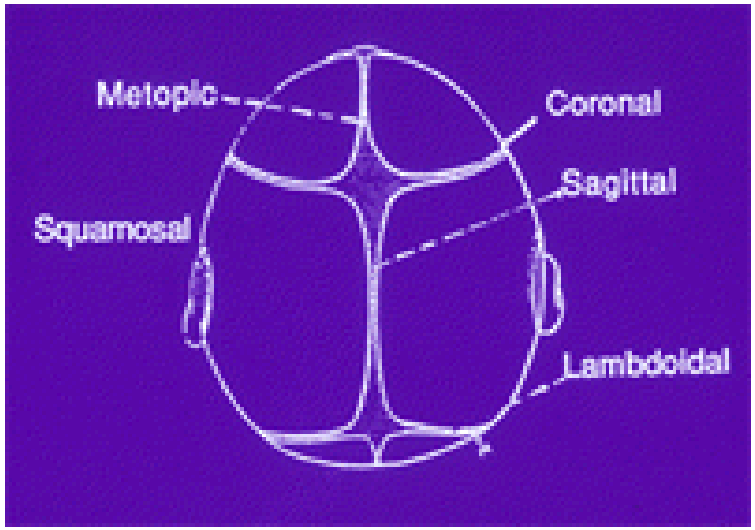
3. Crouzon-syndrome

(Octave Crouzon)

(dysostosis craniofacialis)

premature fusion of cranial sutures

(increasing intracranial pressure)



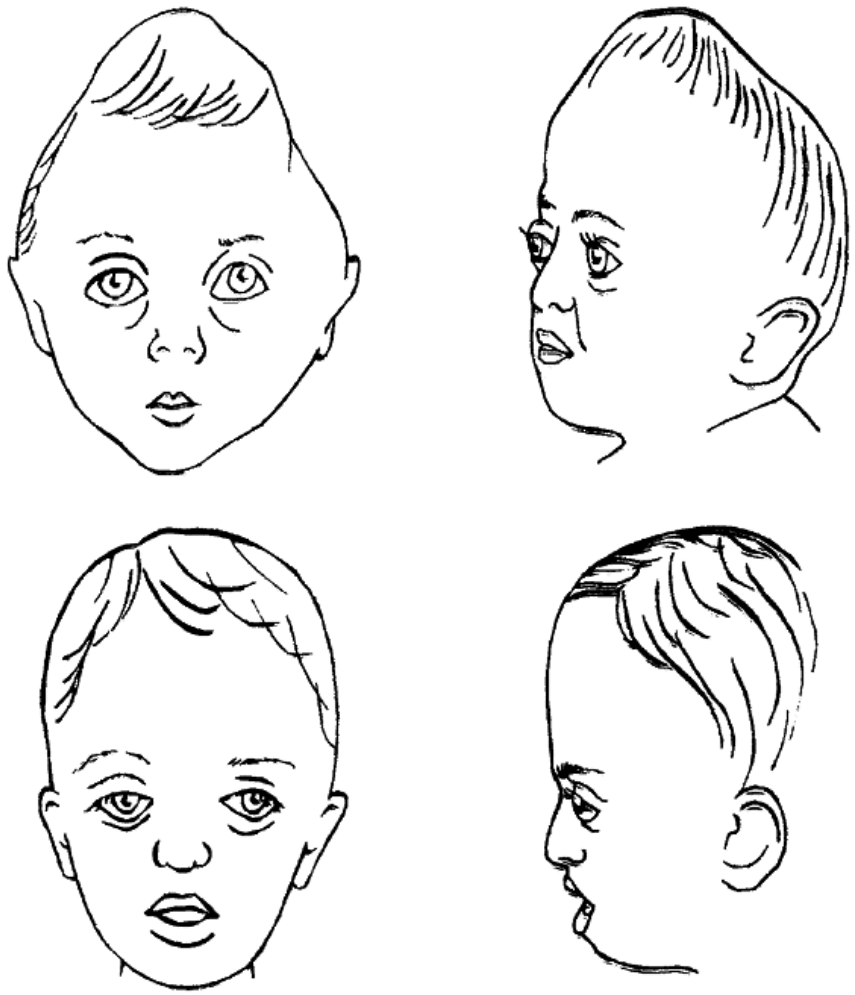
Autosomal dominant inheritance

3. **Crouzon syndrome**

(dysostosis craniofacialis)

Symptoms:

- cerebral harms
- mid-face hypoplasia
- shallow orbits
- exophthalmus
- strabismus
- blindness
- hearing loss
- syndactyly



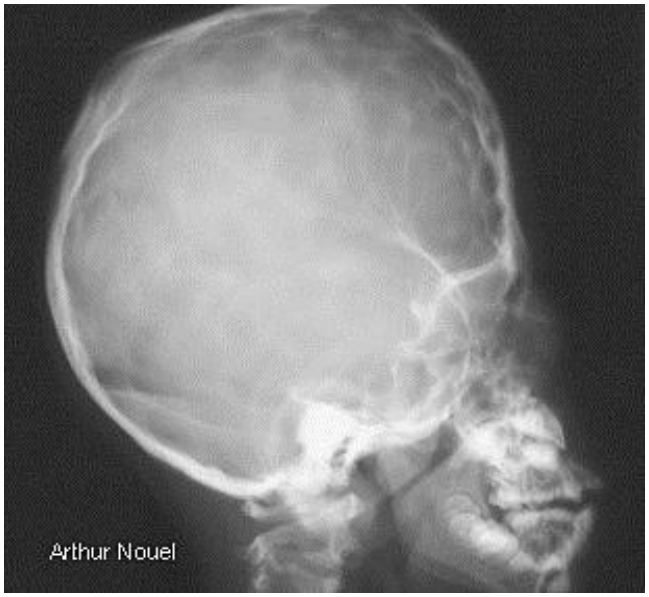
Autosomal dominant inheritance

3. Crouzon syndrome

(dysostosis craniofacialis)

Dental symptoms:

- maxilla hypoplasia (narrow arch)
- crowding of teeth
- progenia
- open bite
- cross bite (1 or 2 side)

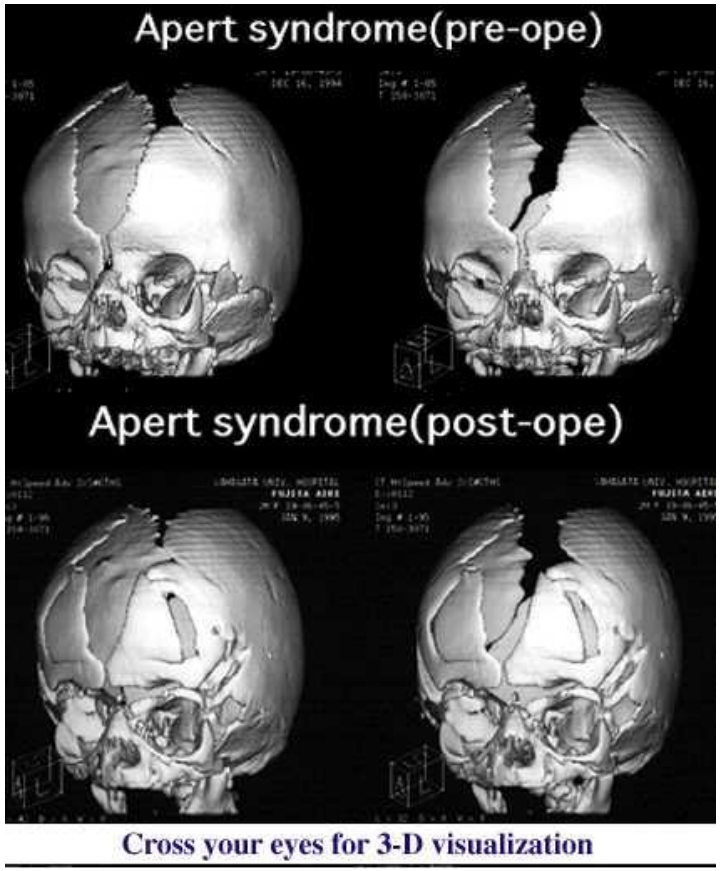


Autosomal dominant inheritance

4. Apert syndrome

(E. Apert, 1906)

(acrocephalosyndactyly)



- it is characterized by the **premature closure of the seams** between the skull bones, which results in a peaked head and an unusual facial appearancei

- it has many different types in combinations of clinical symptoms and severity

- 1:160.000-200.000

Autosomal dominant inheritance

4. Apert syndrome

(acrocephalosyndactyly)

Symptoms:

- unusual facial appearance
- skeletal (limb) abnormalities
- full-length webbing or fusion between the fingers and toes
- retarded intellectual development
- prominent or bulging eyes

Autosomal dominant inheritance

4. **Apert syndrome**
   (acrocephalosyndactyly)

   Dental symptoms:

- **maxilla hypoplasia**
- **progenia**
- **high and narrow palate**
- **cleft palate**
- **late dentition**
- **crowded teeth**

Autosomal dominant inheritance

5. **Treacher Collins-Franceschetti syndrome** (dysostosis mandibulofacialis)

- a defect of the 5q 32-33 locus
- causes mainly facial defects

Autosomal dominant inheritance

5. **Treacher Collins-Franceschetti syndrome**

(dysostosis mandibulofacialis)

Symptoms:

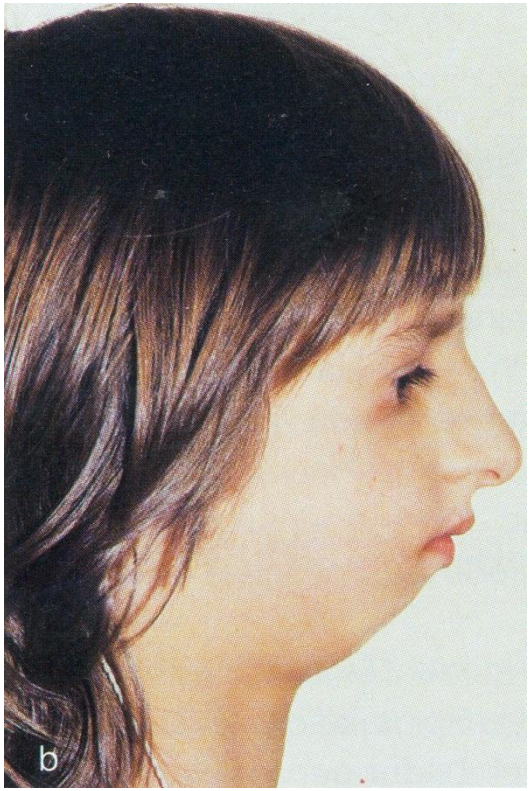
- abnormal to almost completely absent external ears
- hearing loss
- defect in the lower eyelid (coloboma)
- narrow face

Autosomal dominant inheritance

5. **Treacher Collins syndrome** (dysostosis mandibulofacialis)

Symptoms:

- **very small jaw (micrognathia)**
- **sinus maxillaris hypoplasia**
- **parotis aplasia**
- **macrostomia**
- **macroglossia**
- **cleft palate**
- **crowded teeth**



Autosomal dominant inheritance

6. Gardener syndrome

Symptoms:

- multiple osteomas (particularly of the jaws and facial bones)
- multiple polyps of the large intestine
- epidermoid cysts and fibromas of the skin
- polyps have a tendency to rapid malignant change
- **supernumerary teeth**

Autosomal dominant inheritance

7. Waardenburg syndrome

(Petrus Johannes Waardenburg: Dutch eye doctor, who first noticed it in 1951.)

there are at least 4 types

WS1, WS2A, WS2B, WS3 (WS4 – alternative)

WS1 (classic form)

- characterized by varying degrees of **hearing loss** and **changes in skin and hair pigmentation**

Autosomal dominant inheritance

7. Waardenburg I. syndrome

Symptoms:

- hearing loss (20%)
- disorder of eyelid
- differently colored eyes (one eye is usually blue and the other is brown)
- distinctive hair coloring
  (patch of white hair)
- broad nasal bridge
- **maxilla and mandibula hypoplasia**
- associated symptoms also:
  - abnormal development of heart and limbs

Autosomal dominant inheritance

8. Marfan syndrome

disorder of connective tissue, that affects:

- skeleton
- lungs
- eyes
- heart
- blood vessels

defect: a protein called **fibrillin** is defficient or Abnormal (the fibrillin gene on chromosome 15)

Autosomal dominant inheritance

8. Marfan syndrome

Symptoms:

- cardio-vascular system
  - wide and more fragile aorta
  - aortic aneurysms
  - a mitral and/or aortic valve prolapse
- lungs
  - spontaneous collapse of the lung (pneumothorax)
- eyes
  - near-sighting
  - dislocation of the ocular lens
  - retinal detachment

Autosomal dominant inheritance

8. Marfan syndrome

Symptoms:

- **sceleton:**
  - **tall stature**
  - **hyperasthenia**
  - **arms, legs and fingers are long**
  - **scoliosis**
  - **pectus deformity**
  - **long face**

Autosomal dominant inheritance

8. Marfan syndrome

Dental symptoms:

- high palate
- malocclusion

Harms of 1 locus

- **autosomal**
  - **dominant**
  - **recessive**

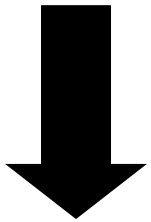
- X-linked
  - dominant
  - recessive

Autosomal recessive inheritance

1. **Dubowitz syndrome**
2. **Ellis van Creveld syndrome**
3. **Pierre Robin syndrome**
4. **Johanson-Blizzard syndrome**
5. **Morquio syndrome**
6. **Sanfilippo syndrome**
7. **Papillion LeFevre syndrome (hyperkeratosis palmoplantaris et periodontoclasia)**
8. **Goldscheider syndrome (epidermolysis bullosa dystrophica)**

Autosomal recessive inheritance

1. **Dubowitz syndrome**
   (1965)



3 main symptoms:

- dwarfizm
- eczema
- peculiar face

the fenotype varies from mild to severe aberrations

about 200 affected patients

Autosomal recessive inheritance

1. Dubowitz syndrome

Characteristics:

- growth retardation (short stature)
- primary microcephaly
- characteristic facial appearance:
  - small face
  - micrognathia
  - broad nasal bridge
  - telecanthus
  - broad and high forehead
- mild mental retardation
- eczematous skin eruption (min. 50 %)

- photosensitivity
- sparse body and scalp hair
- anaemia
- anaemia
- jug-ear
- short neck
- poly- or syndactyly

Autosomal recessive inheritance

1. Dubowitz-syndrome

Characteristics:

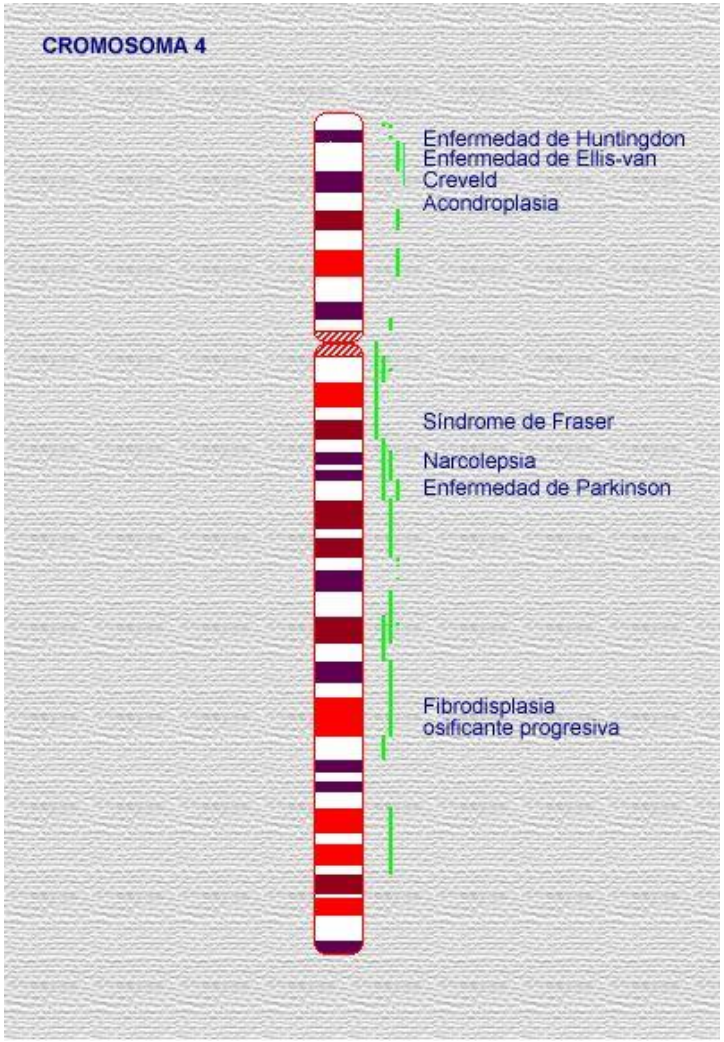
- large or small mouth
- high and narrow palate
- cleft palate
- micrognathia
- dental symptoms:
  - delayed eruption
  - crowded teeth
  - micro- or macrodontia
  - malocclusion
  - diastema
  - oligodontia
  - fused teeth
  - doubled teeth

Autosomal recessive inheritance

2. Ellis van Creveld syndrome

chondroectodermal dysplasia with oral symptoms

- the gene has been mapped to the short arm of chromosome 4 („**EVC-gene**")
- the function of a healthy EVC gene is not known
- this syndrome is often seen in a little isolated group of people in Pennsylvania



Autosomal recessive inheritance

2. Ellis van Creveld szindróma

Symptoms:

- malformations of the bones
  - short limbs
  - short stature
- dystrophy of the fingernails and hair
- mental retardation
- congenital heart defects (50%)
- polydactyly (additional digit next to the 5th finger)

Prognosis

Autosomal recessive inheritance

2. Ellis van Creveld syndrome

Symptoms:

- oral problems:
  - prenatal eruption of the teeth
  - mainly lower incisors are affected
  - hypodontia
  - abnormal frenulae
  - missing or peg-shaped teeth
  - enamel hypoplasia
  - tendency to get cavities (early dental care!)

Autosomal recessive inheritance

3. Pierre Robin syndrome

It was first described in 1891.

Prevalence: 1 per 8500

3 pathophysiological theories exist to explain the occurance, the most accepted:

The **mechanical theory**: The mandibular hypoplasia occurs between the 7th and 11th week of gestation. This keeps the tongue high in the oral cavity, causing a cleft in the palate by preventing the closure of the palatal shelves.

Autosomal recessive inheritance

3. Pierre Robin syndrome

Symptoms:

- respiratoric distress syndrome in the newborn
- heart defects
- syndactyly, polydactyly (in 70-80%)
- clubfeet
- otitis media
- hearing loss
- gastroesophageal reflux
- esophagitis

Autosomal recessive inheritance

3. Pierre Robin syndrome

Symptoms:

- micrognathia (91.7%)
- glossoptosis (70-85%)
- macroglossia and ankyloglossia
- cleft palate

Autosomal recessive inheritance

4. Johanson-Blizzard syndrome

Extremely rare inherited disorder!

Symptoms:

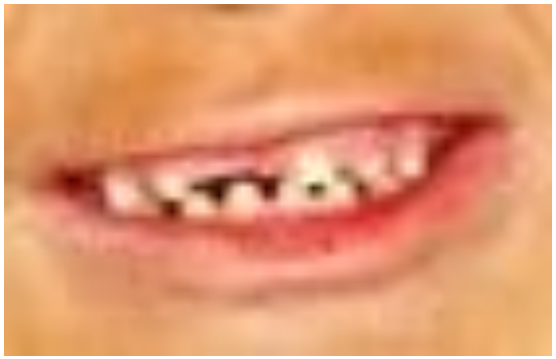
- congenital absence or underdevelopment of the nostrils: „beak shaped” nose
- insufficient intestinal absorption (malabsorption)
- pancreatic insuffitiency
- short stature
- hypothyroidism
- weakness of mental and physical activity (psychomotor retardation)
- congenital hearing loss

Autosomal recessive inheritance

4. Johanson-Blizzard syndrome

Symptoms:

- dental symptoms:
  - abnormally small, malformed primary teeth
  - problems with the development of permanent teeth
  - misshapen or absent permanent teeth



Autosomal recessive inheritance

5. Morquio syndrome

2 types:

mucopolysaccharidosis type IVA (galactoseamine-6-sulfatase enzyme deficiency)

mucopolysaccharidosis type IVB (ß-galactosidase enzyme deficiency)

Consequence:

accumulation in the body and brain of abnormally large amounts of mucopolysaccharide

Autosomal recessive inheritance

5. Morquio syndrome

Symptoms:

- short stature
- coarse facial features
- abnormal development of many bones including the spine
- hypermobile joints
- enamel defects
- life expectancy: may exceed 20 years

Symptoms are delayed until after the 1st year!

Autosomal recessive inheritance

6. Sanfilippo syndrome

(Dr. Sylvestor Sanfilippo, 1963)

- mucopolysaccharidosis

- absence of one of several enzymes

- large amounts of heparan-sulfate (mucopolysaccharide) are excreted in the urine

- 4 main types:

Sanfilippo A	**Heparan-N-sulphatase**
Sanfilippo B	**α-N-Acetylgucosaminidase**
Sanfilippo C	**AcetylCoA:N-acetyltransferase**
Sanfilippo D	**N-Acetylglucosamine 6-sulphatase**

Autosomal recessive inheritance

6. Sanfilippo syndrome

Symptoms:

- short stature
- coarse facial features
- mental retardation
- gait disturbances
- short, massive bones
- stiff joints
- liver and spleen enlargement
- speech disturbances
- full lips
- bulky eyebrow
- gargoyle-face
- macroglossia

Autosomal recessive inheritance

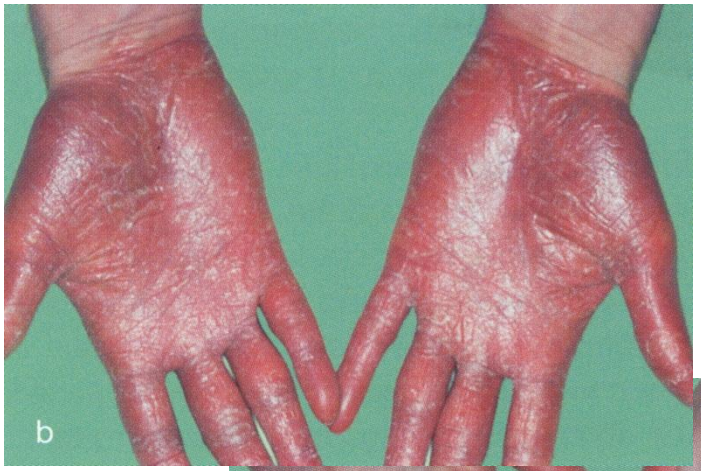
6. Sanfilippo syndrome

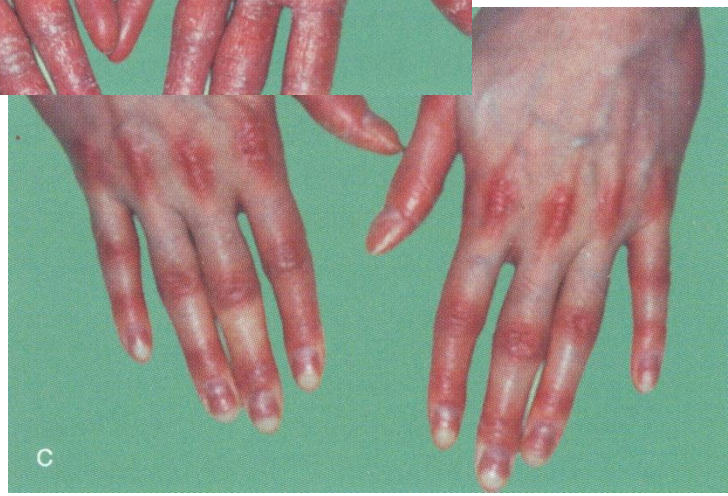
Characteristics:

- symptoms are delayed until after the 1st year! bulky eyebrow
- life expectancy: may exceed 20 years
- 1: 66.000

Autosomal recessive inheritance

7. **Papillion LeFevre syndrome**
   (hyperkeratosis palmoplantaris et periodontoclasia)





main characteristics:

- palmoplantar hyperkeratosis
- juvenile parodontitis

Autosomal recessive inheritance

7. Papillion LeFevre syndrome

Symptoms:

- right after the eruption of primary teeth:
  - chr. gingivitis
  - fast destruction of the alveolar bone
  - primary teeth are eliminated from the granulated tissue 1-2 years after the eruption
- mucous membrane is intact in the toothless oral cavity
- after the eruption of permanent teeth:
  - parodontitis again
  - fast bone destruction
  - 1st molars are missing before the eruption of incisors
- individual becomes totally toothless for 14-16 years

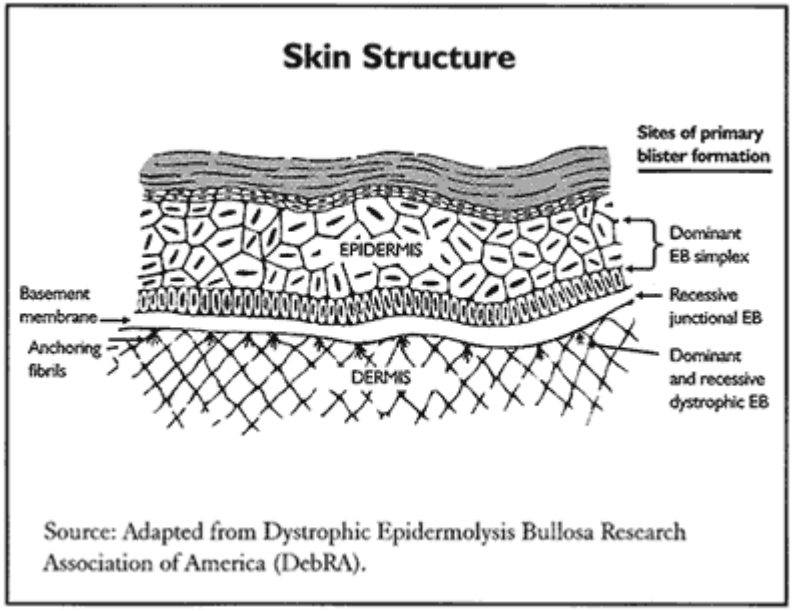
Autosomal recessive inheritance

8. Goldscheider syndrome

(epidermolysis bullosa dystrophica)

Epidermolysis bullosa (skin blisters develop in response to minor trauma):

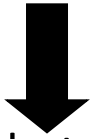
- 2-4: 100.000
- more, than 10 genes
- 4 main types:
  - epidermolysis bullosa simplex
  - epidermolysis bullosa junctionale
  - epidermolysis bullosa dystrophica
  - epidermolysis bullosa hemidesmosomale



Autosomal recessive inheritance

8. Goldscheider syndrome

(epidermolysis bullosa dystrophica)



- fluid-filled blisters that develop in response to minor trauma or temperature change (or spontaneous)
- chafing of the skin, rubbing or even increased room temperature may cause blisters to form
- scarring after blister may cause deformities
- there are 4 main types and many different subtypes
- varies in severity from minor blistering of the skin to a lethal form involving other organs

Autosomal recessive inheritance

8. Goldscheider syndrome

(epidermolysis bullosa dystrophica)

Symptoms:

- blistering of the skin
- nail loss or deformed nails
- alopecia (hair loss)
- hoarse cry and cough
- other respiratory difficulties
- blistering in or around the mouth and throat
- **enamel hypoplasia**
- **tooth decay**

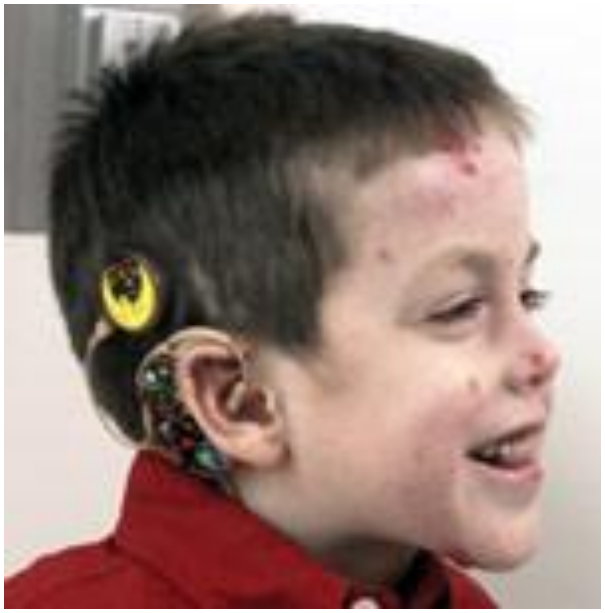
Autosomal recessive inheritance

8. Goldscheider-syndrome

(epidermolysis bullosa dystrophica)

Prevention:

- keeping rooms at an even temperature
- applying lubricants
- using simple, soft clothing that requires minimal handling when dressing a child
- wearing mittens at bedtime
- **regular controll in dental office**



Genetic disorders

3 groups:

- anomalies caused by harms of 1 gene (locus)
- multifactorial inherited anomalies
- chromosome aberrations

Harms of 1 locus

- autosomal
  - dominant
  - recessive

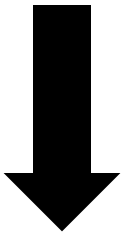
- **X-linked**
  - **dominant**
  - **recessive**

X-linked inheritance

1. **Aarskog syndrome**
2. **Albright-Buttler-Bloomberg syndrome**
3. **Goltz (Goltz-Gorlin) syndrome**
4. **Rapp-Hodgkin syndrome (ectodermalis dysplasia)**

X-linked inheritance

1. Aarskog syndrome



- X-linked recessive genetic disorder
- main symptoms:
  - short stature
  - musculosceletal and genital anomalies
  - facial abnormalities

X-linked inheritance

1. Aarskog syndrome

Symptoms:

- short stature, which not be obvious until the child is between 1 and 3
- delayed sexual maturation
- mild to moderate mental retardation
- macrocephalia
- underdeveloped mid-portion of the face
- rounded face
- wide set eyes with droopy eyelids
- small nose
- **hypoplasia of the upper and lower jaws**
- **delayed eruption of teeth**

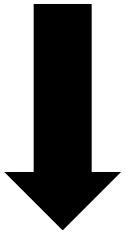
X-linked inheritance

2. Albright-Buttler-Bloomberg syndrome

Fuller Albright

Allan Macy Butler

Esther Bloomberg



X-linked, dominant genetic disorder

X-linked inheritance

2. Albright-Buttler-Bloomberg syndrome

Symptoms:

- dwarfism
- rachitis
- osteomalatia
- hypophosphataemia
- hyperphosphaturia
- the amount of Ca in the serum is normal!
- bone anomalies do not respond to vitamin D treatment
- **enamel hypoplasia**

X-linked inheritance

3. **Goltz (Goltz-Gorlin) syndrome**
   (focal dermal dysplasia)
   (RW Goltz, 1962)

- X-linked, dominant disorder; de novo mutation
- gene: short arm of the X chrom.
- women (1998: 150 females and 11 males)
- it is characterized by malformed skin (appearance, function); hair, nails, teeth also

X-linked inheritance

3. Goltz (Goltz-Gorlin) symptoms

Symptoms:

Skin:

- epidermis: deformed or absent
- dermis: abnormal formation of IV type collagen

Hair:

- missing in patches or completely absent

Teeth and nails:

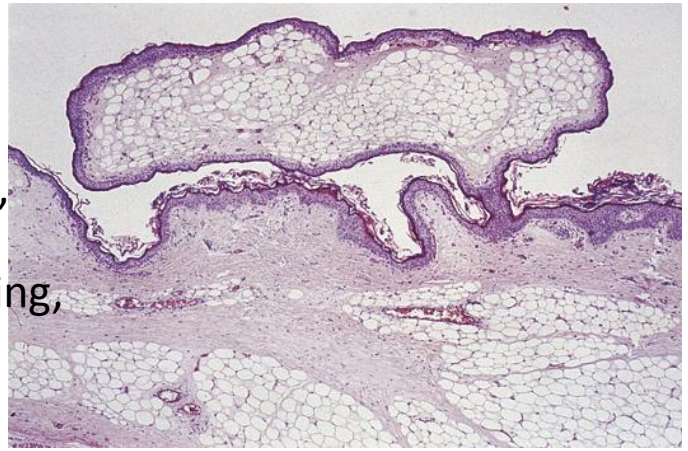
- unusual appearance

The skin is completely absent, or discolored, itchy, or blistered.

X-linked inheritance

3. Goltz (Goltz-Gorlin) syndrome

Symptoms:



Skin lesions:

- depigmentation
- inflammed, irritated areas (itching, blistering, reddening, swelling, crusting, bleeding)
- papillomas (gums, lips, tongue, vaginal opening, anus)
- excessive skin growth: hyperhidrosis
- hypohidrosis

Skeleton:

- fingers and toes (webbing, fusion or polydactyly)
- curvature of the spine
- underdevelopment or protrusion of the lower jaw
- fused vertebrae

Facial asymmetry

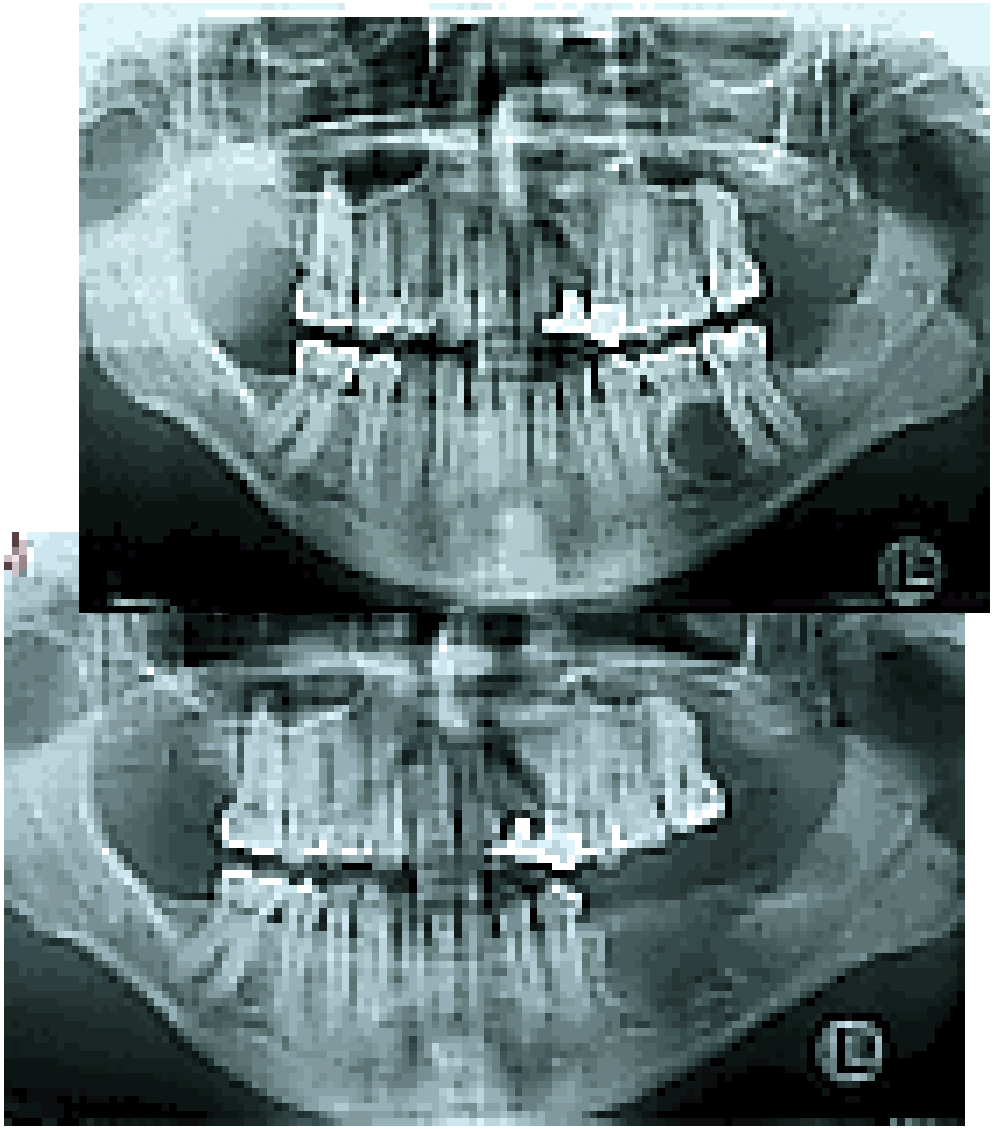
- eyes, ears, chin

X-linked inheritance

3. Goltz (Goltz-Gorlin) syndrome

Dental symptoms:

- incomplete tooth enamel
- frequent cavities
- teeth
  - malformed
  - mispositioned
  - absent



X-linked inheritance

4. **Rapp-Hodgkin syndrome**
   (anhidrotic ectodermal dysplasia)

- it has many different types
- X-linked, dominant inherited anomaly is the most common
- it is characterized by abnormal development of the skin and associated structures (hair, nails and teeth, sweat glands)

X-linked inheritance

4. Rapp-Hodgkin syndrome

(anhidrotic ectodermal dysplasia)

Symptoms:

- absent or decreased sweat and tear glands
- temperature control is a problem (heat intolerance, extremely high fevers)
- chronic nasal infections
  - foul-smelling discharge
- thin skin
- decreased pigment
- photophoby
- absent or scanty body hair
- alopecia
- small and abnormal nails

X-linked inheritance

4. **Rapp-Hodgkin syndrome**

(anhidroticus ectodermalis dysplasia)

oral structures:

- **small mouth**
- **cleft palate**
- **hypodontia**
- **enamel hypoplasia**
- **delayed or absent tooth formation**

Genetic disorders

3 groups:

- harms of one locus
- **multifactorial inherited anomalies**
- chromosome aberrations

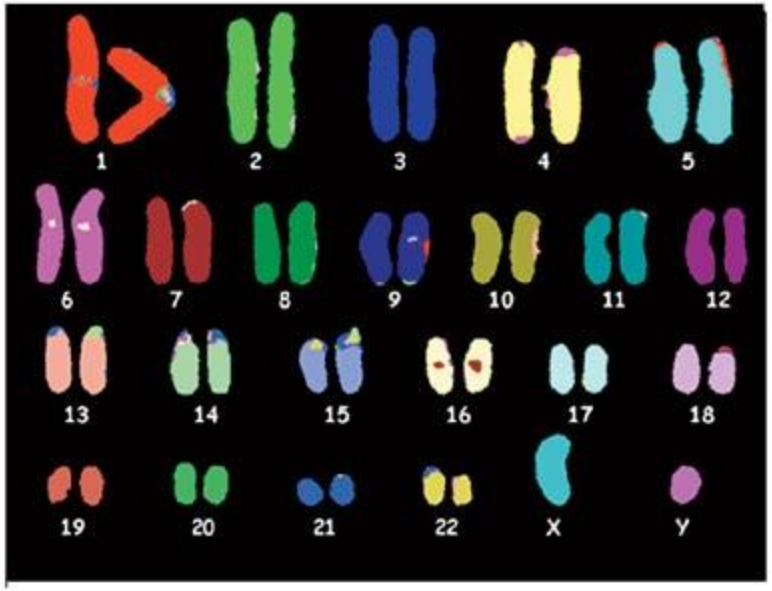
Multifactorial inherited disorders

- **there are many gene variations in a population (set of genes, environmental effects)**
- **many gene pairs make individual being susceptible to disorders caused by the environment**
- **accumulation can be in a family**
- **risk is higher amoung near relatives (shared genes)**
- **when the parent is healthy the anomaly will recur in offspring in 1-15%**
- **distribution of normal and abnormal genes (limit)**
- **the limit can be different in males and females**
- **disorders having quantity character:**
  - hypertony
  - ischemic heart disease
  - psychiatric diseases
  - diabetes mellitus
- **disorders having quality character:**
  - cleft palate and lip
  - spina bifida

Genetic disorders

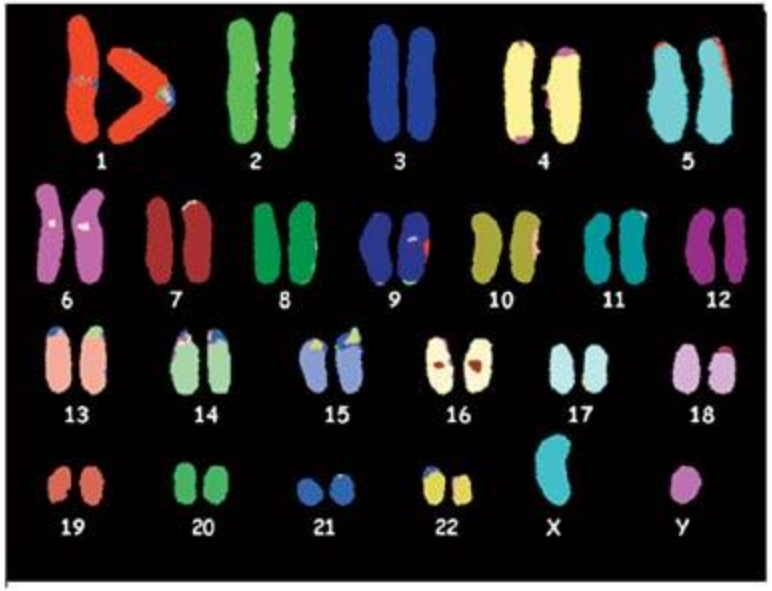
3 groups:

- harms of one locus
- multifactorial inherited anomalies
- **chromosome aberrations**



Chromosome aberrations

- **numerical**
- **structural** (in shape) – one or more chromosomes have changed morphology (size, pattern)
- **combinated**



Chromosome aberrations

Numerical changes

1. **Changes in the number of autosomal chromosomes**
   - **Down syndrome**
   - **Edwards syndrome**
   - **Patau syndrome**

2. **Changes in the number of sex chromosomes**
   - Turner syndrome

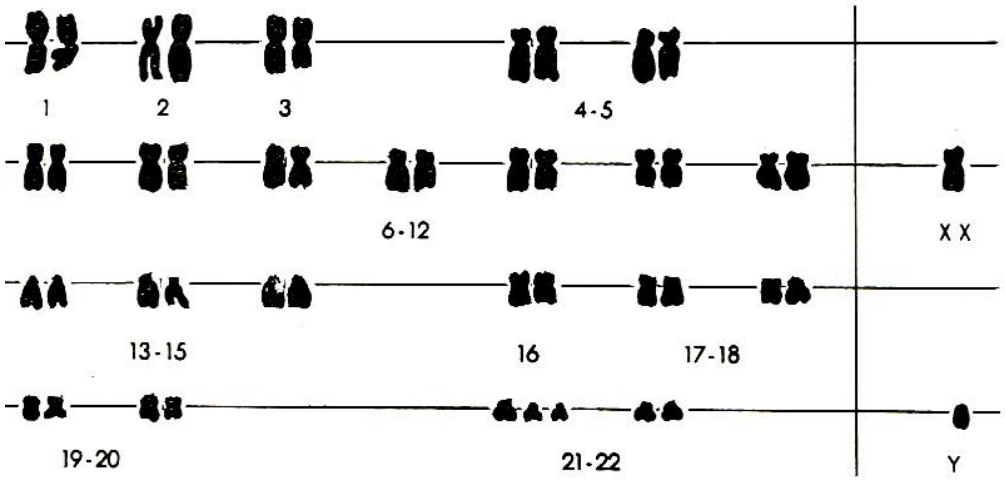
Chromosome aberrations

Numerical changes:

(autosomal)

Down syndrome

- **the commonest of all malformation, affecting up to 1 in 600 births**
- **extra 21st chromosome (trisomy 21) in 95%**
- **it caused by translocation in about 3-4% of people with Down syndrome**



Chromosome aberrations

Down syndrome

Symptoms:

- severe mental retardation
- short stature
- microcephalia
- decreased muscle tone
- extremely flexible joints
- characteristic facial appearance
- mongoloid eye: epicanthal folds over the eye
- small nose with flattened nasal bridge
- abnormal outer ear
- short and wide hand
- single palmar crease

Chromosome aberrations

Down syndrome

Symptoms:

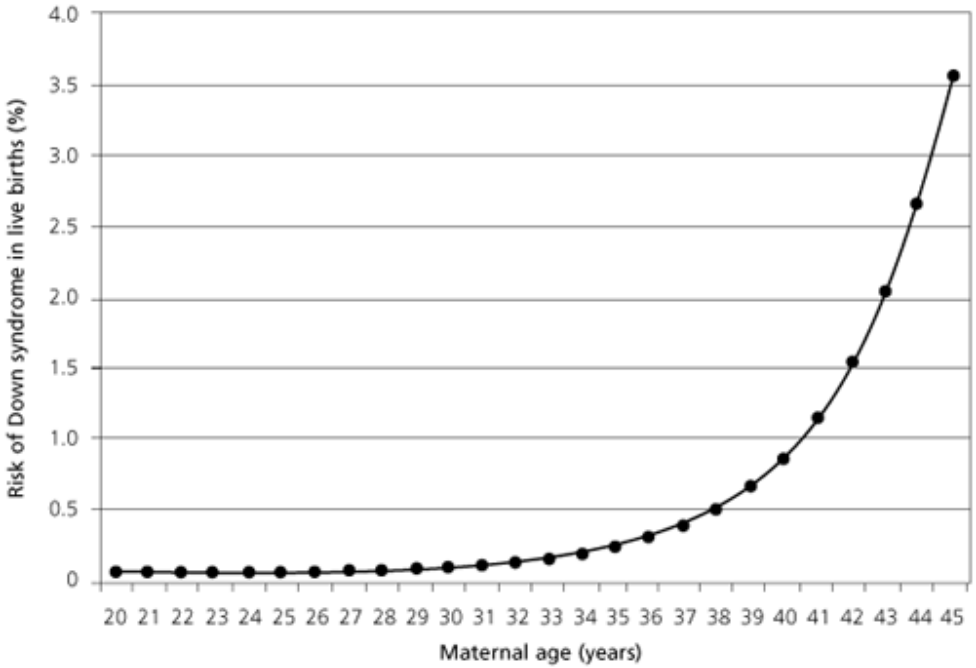
- macroglossia
- microdontia
- hypodontia
- dysgnathia
- delayed eruption of teeth
- cross bite
- open bite
- parodontitis
  - after the eruption of primary teeth
  - mild gingivitis but deep sulcus
  - it can not be explained with the bad oral hygiene

Chromosome aberrations

Down syndrome

Symptoms:

- frequent congenital heart defects
- susceptibility to infections
- life expectancy is good
- the risk of Down syndrome increases with age after 40 years
- prenatal diagnosis (amniocentesis) is recommended for all pregnant women age 35 or older



Chromosome aberrations

Down syndrome

Diagnosis:

- screening tests
- blood tests
- ultrasound scan
- chorionic villus testing
- amniocentesis

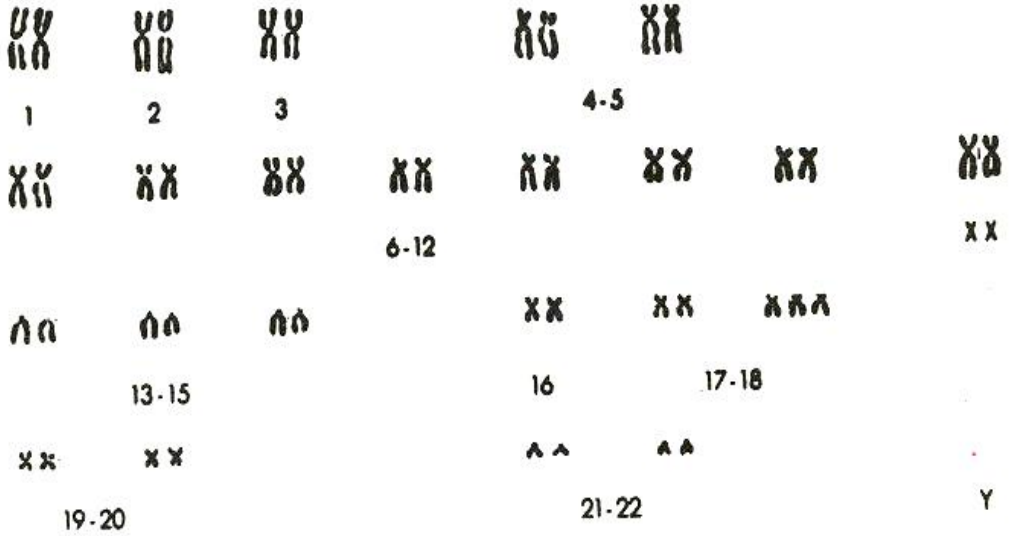
Chromosome aberrations

Numerical changes:

(autosomal)

Edwards syndrome

- **trisomy 18**
- **1 out of 3000 live births**
- **the multiple abnormalities make hard for infants to live longer than a few months**



Chromosome aberrations

Edwards syndrome

Symptoms:

- severe mental deficiency
- abnormal development:
  - heart
  - kidney
  - eye
- clenched hands and underdeveloped fingernails
- microcephalia
- flat forehead
- protruded occiput
- abnormal ears
- **cleft palate and lip**

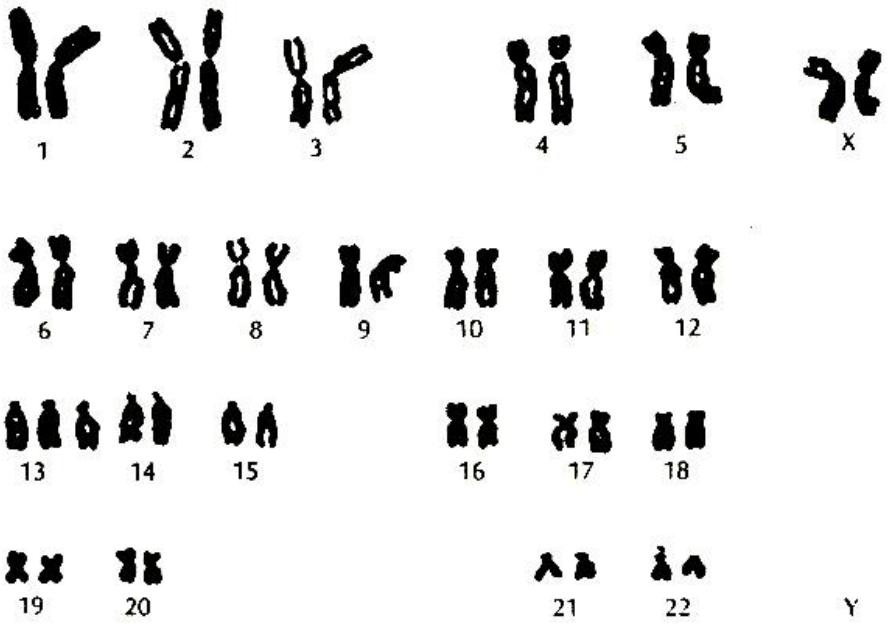
Chromosome aberrations

Numerical changes:

(autosomal)

Patau syndrome

- **trisomy 13**
- **frequency: 1 out of every 5000 live birth**
- **the multiple abnormalities often are not compatible with life (80% of children die in the 1st month)**



Chromosome aberrations

Patau syndrome

Symptoms:

- multiple congenital aberrations
- severe mental retardation
- congenital heart diseases
- poly- or hexadactyly
- microcephalia
- wide nasal bridge and face
- small eyes (microphthalmia) and eyes close set
- **cleft palate and lip**

Chromosome aberrations

Numerical changes

1. Changes in the number of autosomal chromosomes
   - Down syndrome
   - Edwards syndrome
   - Patau syndrome

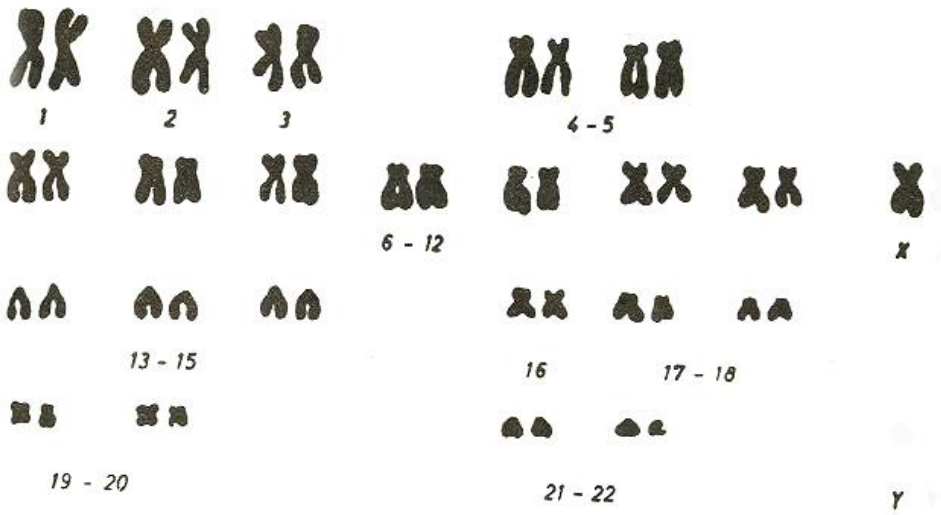
2. **Changes in the number of sex chromosomes**
   - **Turner syndrome**

Chromosome aberrations

Numerical changes:

(gonadal)

Turner syndrome



- **monosomy X**
- **frequency: 1 out of 2000 live birth**

Chromosome aberrations

Turner syndrome

Symptoms:

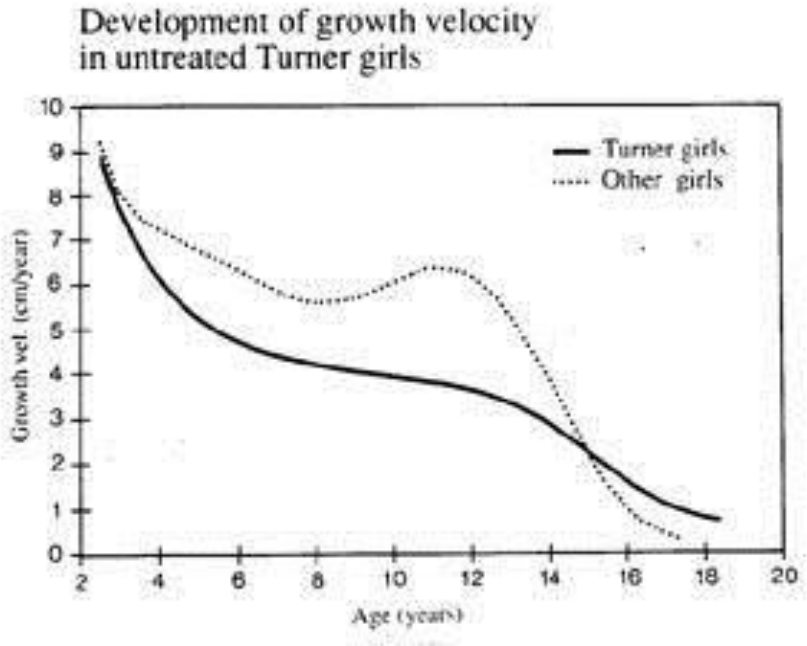
- it occurs only in females
- sexual infantilism or gonadal dysgenesis
- mental deficiency
- short height
- webbed neck
- low hairline
- underdeveloped body hair
- „shield-shaped” chest
- heart and kidney abnormalities

Chromosome aberrations

Turner syndrome

Dental symptoms:

- mandibula hypoplasia
- narrow and high palate
- crowded teeth



Inherited disorders result in dental anomalies:

- early diagnosis
- preventive treatment (reqiured time and required methods)
  - special knowledge
  - thoroughness
  - more often control as usually

Thank you!