


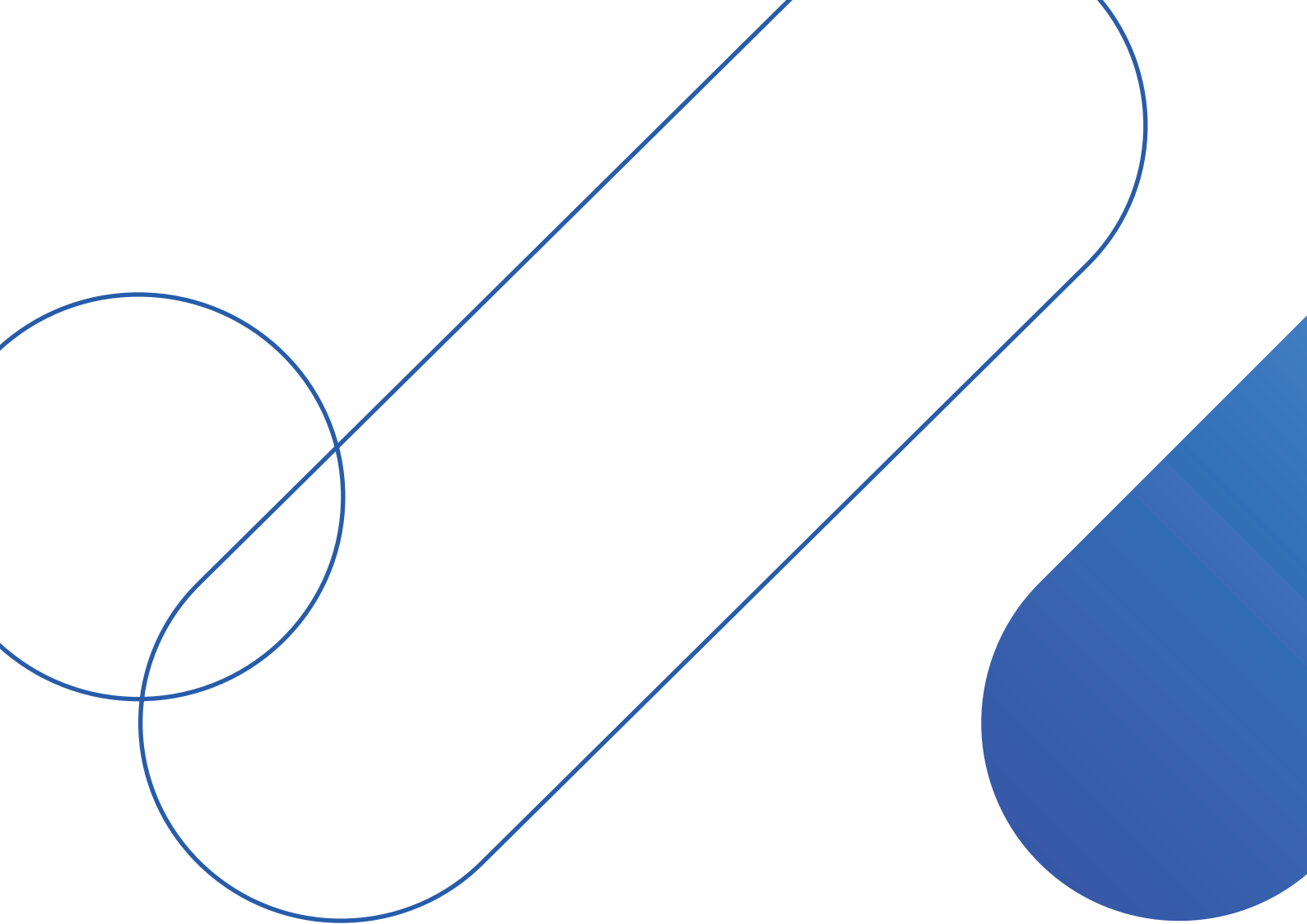
**STEM CELLS  
TREASURE  
FOR LIFE**

 **SWISS KNOW-HOW**

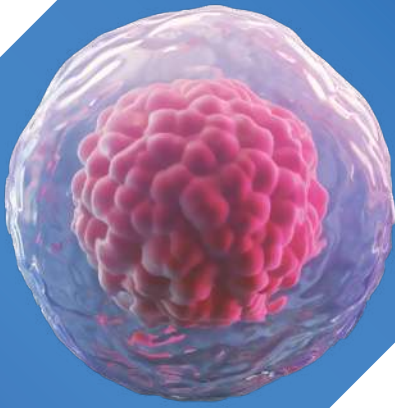
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# STEM CELLS AND THE UMBILICAL CORD

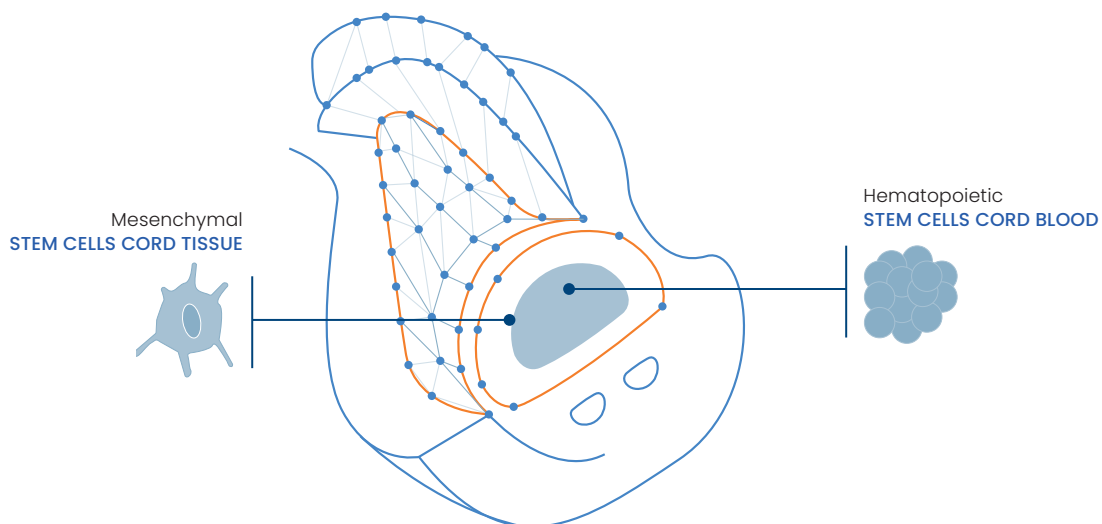


## WHAT ARE STEM CELLS?

Stem cells are primary, non-specialised cells that have enormous reproductive potential and the ability to transform into specialised cells. Thanks to these properties, they are used in medicine to restore damaged cells.

## WHERE CAN STEM CELLS BE FOUND?

Stem cells are found in various parts of the body (including the umbilical cord blood, the umbilical cord itself and the placenta). The special feature of these stem cells is that they are young and free from environmental influences and thus have a high regenerative capacity. They can only be harvested and stored during birth.



## STEM CELLS FROM THE UMBILICAL CORD AND PLACENTA

- ⚡ The umbilical cord is rich in two different types of stem cells, which can be used to treat different diseases due to their unique properties.
- ⚡ **Hematopoietic** stem cells from the umbilical cord blood: They are similar to stem cells from bone marrow and produce all cells of the blood and immune system. Currently, more than 80 diseases are treated with them.
- ⚡ **Mesenchymal** stem cells from the umbilical cord and placenta tissue: These can differentiate into cartilage, bone, muscle and other tissues. Under specific circumstances, these cells can be used for a joint transplantation with cells from the umbilical cord blood or bone marrow.
- ⚡ Both types of stem cells are currently being investigated in dozens of clinical trials for the treatment of diseases such as type 1 diabetes, cerebral palsy, rheumatoid arthritis, etc.

# UMBILICAL CORD BLOOD

## UMBILICAL CORD BLOOD

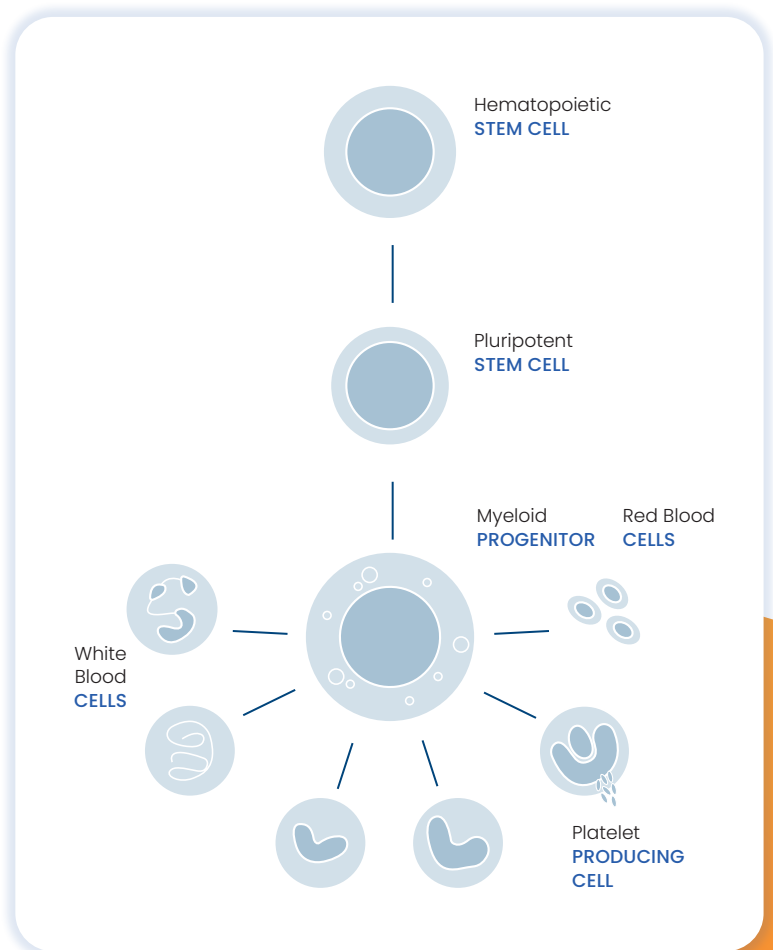
Umbilical cord blood is the blood that remains in the umbilical cord and placenta after birth and the cutting of the umbilical cord. It is a valuable source of stem cells and is currently collected for the isolation of stem cells for storage and later therapeutic use.

Stem cells from the umbilical cord blood can be transplanted similarly to those from bone marrow for the regeneration of the hematopoietic and immunological system and are characterized by a higher efficacy than stem cells from adult donors. They can be used both in autologous (when the donor is also the recipient of the cells removed) and allogeneic transplants (when the recipient receives cells from another person, e.g. in family transplants).

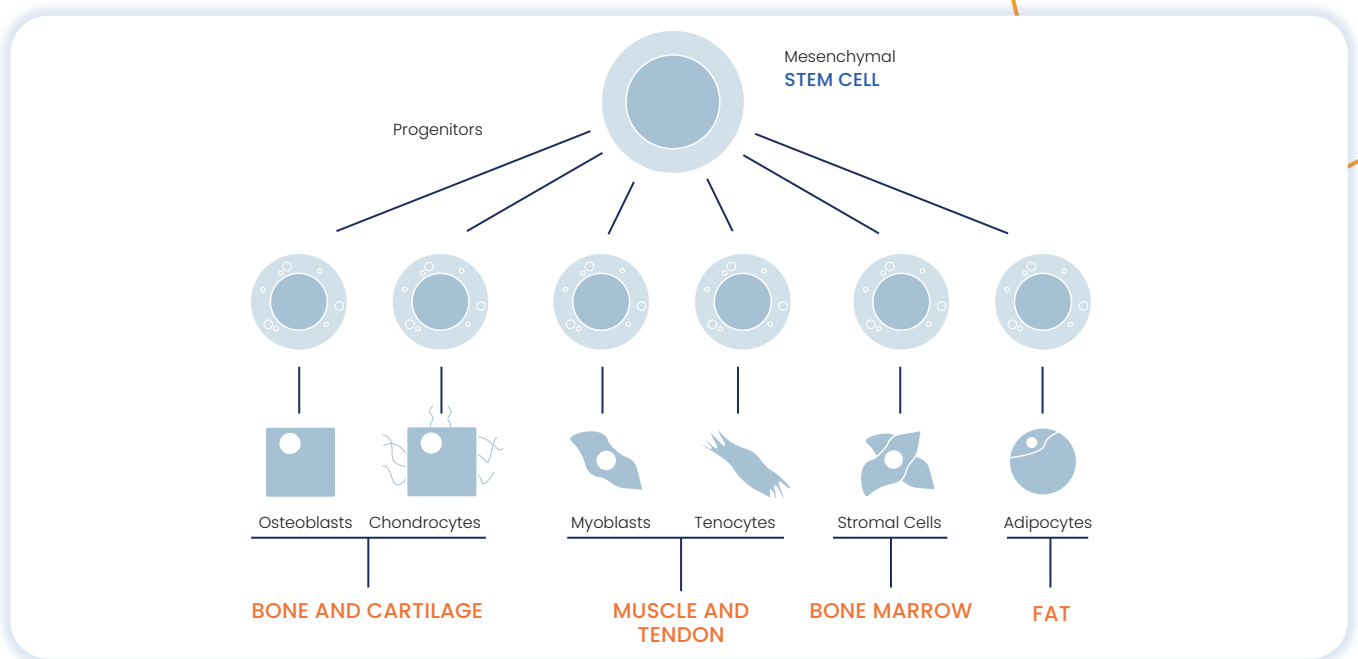
## ADVANTAGES OF STEM CELLS FROM THE UMBILICAL CORD BLOOD

The advantages of stem cells from cord blood over those from bone marrow contribute to the fact that the former are increasingly used in life-saving measures. Although stem cells from the bone marrow can be collected throughout the whole life, stem cells from the umbilical cord blood are much more valuable, which is illustrated in some of the following points:

- ⚡ **Collection takes only a few minutes and is safe and non-invasive**
- ⚡ **Represents a once in a lifetime opportunity to collect such a quality of stem cells**
- ⚡ **Cord blood is immediately available for the recipient**
- ⚡ **Higher multiplication potential**
- ⚡ **Greater compatibility between donor and recipient**



# UMBILICAL CORD AND PLACENTA TISSUE



## UMBILICAL CORD TISSUE

The umbilical cord contains special stem cells - the so-called mesenchymal cells. They have slightly different characteristics than stem cells from the umbilical cord blood: They differentiate much more easily into other cell types such as nerve, bone and cartilage cells.

The cells from the umbilical cord are called cells from Wharton's jelly. It is a special tissue that surrounds the umbilical cord vessels. The umbilical cord can be obtained very easily after birth. The procedure is non-invasive and painless for both the child and the mother. The doctor or midwife cuts a small, 10-15 cm long section of the umbilical cord and places it in a special container. In the laboratory the tissue is examined, prepared and then frozen. It is possible to isolate stem cells before freezing.

## PLACENTA TISSUE

An important feature of the placenta stem cells is their low immunogenicity! Immunogenicity is defined as the ability of cells to provoke an immune response and is generally considered to be an undesirable physiological response in cell therapy. However, due to their hypo immunogenicity and unique immunosuppressive properties, mesenchymal stem cells (MSCs) are considered one of the most promising adult stem cell types for cell therapy. For this reason, these cells can be used for different individuals without the need for HLA compatibility. MSCs from the placenta and the newborn baby's cord tissue can thus be stored and used by the whole family!

**QUANTITY:** Possible to store a higher quantity of MSC

**LOW RISK OF NON-REMOVAL**

**TIMING:** The process is prolonged up to 120 HOURS (5 DAYS), which ensures a high percentage of vitality of the cells themselves

**STERILITY:** Microbial contamination minimized

**USE:** MSCs are potentially suitable for regenerative medicine and can be stored and provided to the whole family as they do not require HLA compatibility



## WHY IS IT WORTH STORING STEM CELLS?

The storage of the umbilical cord blood at birth is certainly one of the most important decisions in life that you have to make. Here you will find everything you need to know about it and what it can be used for.

The first successful use of umbilical cord blood cells was in France in 1988. In 2007 umbilical cord blood from FamiCord Suisse was used for the first time. So far, the stem cells from the umbilical cord blood have been transplanted 60,000 times, saving the life or health of many people. Medicine is constantly developing and the list of diseases for which the transplantation of stem cells is the therapeutic standard is constantly increasing.

## CRYOPRESERVATION ALLOWS THE IMMEDIATE AVAILABILITY OF STEM CELLS

Cryopreservation means that cells are preserved for a long period of time at low temperatures ( $-196^{\circ}\text{C}$ ) without losing their viability. The stem cells can be easily thawed for use and are immediately available.

## BENEFITS OF THE STORAGE

### 80 ONCOLOGICAL AND HAEMATOPOIETIC DISEASES

So many diseases are treated as standard with the transplantation of stem cells from the umbilical cord blood

### AUTISM AND INFANTILE CEREBRAL PALSY

Patients with these diseases benefit from the application of stem cells from the umbilical cord blood

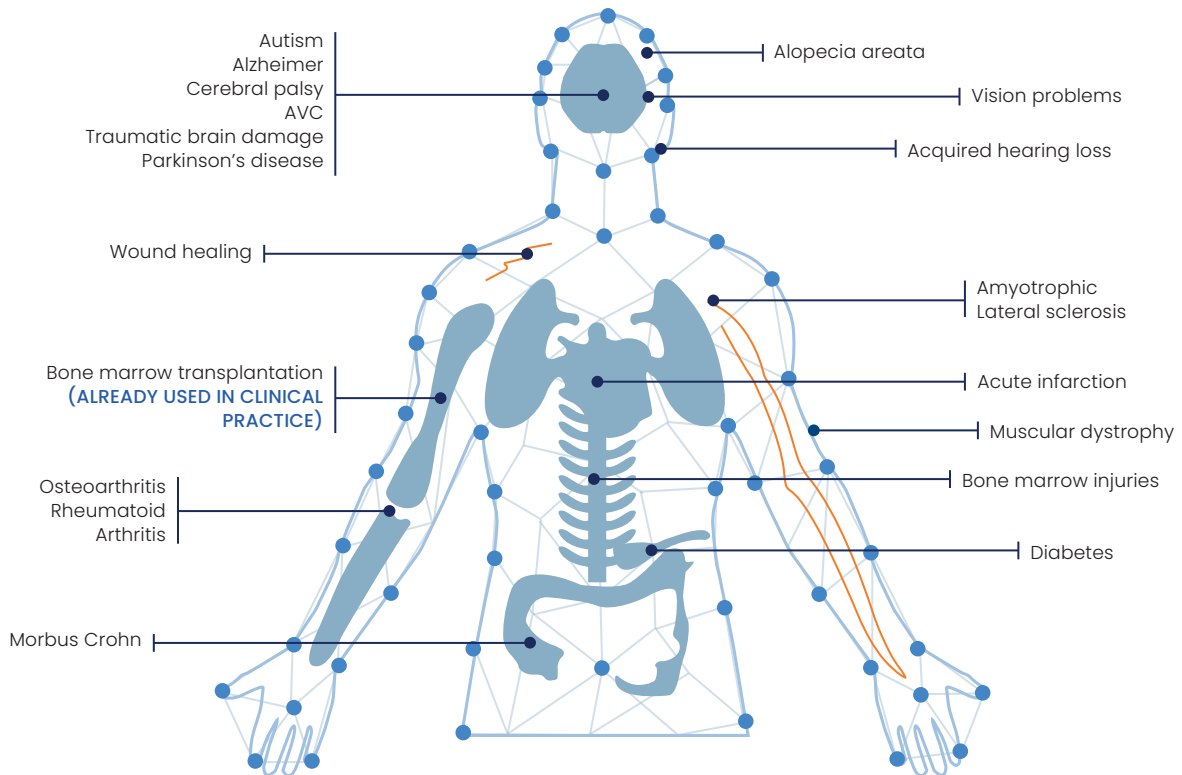
### REGENERATIVE MEDICINE

Umbilical cord and placenta stem cells are widely used in the reconstruction of neurons, joints and bones

Perinatal stem cells have ten times the regenerative capacity of bone marrow. Rather, they are characterized by a lower immunological maturity, which means that their transplantation causes fewer complications for the recipient (in the case of allogeneic transplants this means a lower risk of rejection).

# RESEARCH AND DEVELOPMENT WITH STEM CELLS

Stem cell research is a very promising area of medicine. This is emphasized by thousands of clinical studies with stem cells from different sources in which thousands of patients worldwide with a broad spectrum of diseases (cardiovascular, autoimmune, degenerative diseases etc.) take part. In the year 2012 the potential of this area has once again been recognized by awarding a Nobel Prize in medicine to two scientists working in the field of stem cells.



## CLINICAL STUDIES WITH UMBILICAL CORD BLOOD:

- Diabetes type 1
- Cerebral palsy and other neurological diseases
- Bone marrow injuries
- Peripheral vascular diseases
- Acquired hearing loss
- Autism
- Congenital heart disease
- Stroke

## CLINICAL STUDIES WITH UMBILICAL TISSUE:

- Diabetes type 1 and 2
- Ulcerative colitis
- Cirrhosis
- Multiple sclerosis
- Ankylosing spondylitis
- Idiopathic dilated cardiomyopathy
- Liver failure
- Bronchopulmonary Dysplasia
- Graft-versus-Host disease
- Muscular dystrophy Duchenne

# TREATABLE DISEASES

Stem cells are a therapeutic resource that is currently used for the treatment of more than 80 diseases.

For some of these diseases the own stem cells can be used, especially for bone marrow deficiencies and solid tumours. The autologous usage is preferred for diseases that are not existent from birth on and of no genetic nature.

For other diseases transplantations are performed with cells that were donated from a family member, e.g. for the treatment of leukaemia or metabolic diseases; these diseases are in general related to a genetic mutation and are hereditary.

## ONCOLOGIC DISEASES

- Acute lymphoblastic leukaemia (ALL) (1)
- Acute myelogenous leukaemia (AML)
- Chronic myeloid leukaemia (CML)
- Chronic lymphocytic leukaemia (CLL)
- Myelomonocytic leukaemia
- Solid tumours (e.g. neuroblastoma or retinoblastoma) \*
- Hodgkin's disease
- Non-Hodgkin's lymphomas
- Refractory anaemia
- Myelofibrosis
- Systemic mastocytosis
- Autoimmune lymphoproliferative syndrome
- Histiocytosis
- Langerhans cell histiocytosis
- Hemophagocytic lymphohistiocytosis
- Lymphomatoid granulomatosis
- Childhood chromosome 7 monosomy syndrome

## IMMUNO DEFICIENCIES

- Severe combined immunodeficiency (SCID), including
  - Omenn syndrome
  - SCID with adenosine deaminase deficiency (ADA-SCID) (2)
  - X-linked SCID
- Ataxia telangiectasia syndrome
- DiGeorge syndrome
- Wiskott-Aldrich syndrome
- X-linked agammaglobulinemia
- Chronic granulomatous disease
- IKK gamma deficiency
- Hypogammaglobulinemia
- X-linked lymphoproliferative syndrome
- Griscelli syndrome
- Nezelof syndrome

## HEMOGLOBINOPATHIES

- Beta thalassemia major
- Beta thalassemia intermedia
- Alpha thalassemia intermedia (H-haemoglobin disease)
- Alpha thalassemia major (Hydrops fetalis)
- Sickle cell anaemia

## OTHER DISEASES

- Osteopetrosis

## BONE MARROW DEFICIENCIES

- Aplastic anaemia
- Acquired aplastic anaemia \*
- Fanconi anaemia
- Congenital dyserythropoietic anaemia
- Diamond-Blackfan anaemia
- Congenital sideroblastic anaemia
- Hypoproliferative anaemia
- Pure erythroid aplasia
- Cyclic neutropenia
- Autoimmune neutropenia (severe)
- Evans syndrome
- Paroxysmal nocturnal haemoglobinuria
- Glanzmann's disease (platelet disorder)
- Amegakaryocytic thrombocytopenia
- TAR syndrome (thrombocytopenia with absent radius)
- Severe neonatal thrombocytopenia
- Juvenile dermatomyositis
- Juvenile xanthogranuloma
- Pancytopenia
- Kostmann's syndrome
- Shwachman-Diamond syndrome \*
- Pearson syndrome

## METABOLIC DISEASES

- Adrenoleukodystrophy
- Gunther disease
- Gaucher disease
- Hunter syndrome (MPS-II)
- Hurler syndrome (MPS-I)
- Hurler-Scheie syndrome
- Maroteaux-Lamy syndrome (MPS-VI)
- Sanfilippo syndrome (MPS-III)
- Hermansky-Pudlak syndrome
- Mucopolipidosis type II, III
- Alpha-mannosidosis
- Niemann-Pick disease
- Sandhoff disease
- Tay Sachs disease
- Krabbe disease
- Metachromatic leukodystrophy
- Fucosidosis (fucosidase deficiency disease)
- GM1 gangliosidosis
- Wolman disease
- Aspartylglucosaminuria
- Morquio syndrome (MPS-IV)
- Lesch-Nyhan syndrome
- Austin disease (multiple sulfatase deficiency)

(1) First report of autologous cord blood transplantation in the treatment of a child with leukaemia. Hayani A, Lampeter E, Vivanatha D, Morgan D, Salvi SN. Paediatrics. 2007 Jan;119(1):e296-300.

(2) In combination with genetic therapy

\* In these diseases, the umbilical cord blood was used in an autologous context (donor and recipient are the same person). In all other cases, the cord blood was used in an allogeneic context (donor and recipient are different people), e.g. between brothers.

The list was compiled with the help of the scientific article Moise KJ "Umbilical cord stem cells" Obstet Gynecol 2005; 108: 1393-1407 and the website [www.parentsguidecordblood.com](http://www.parentsguidecordblood.com)



# COLLECTION - STORAGE - APPLICATION

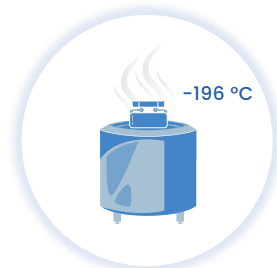
## THE COLLECTION

The collection of the cord blood is a simple, non-invasive procedure. It is performed after the umbilical cord is cut; the blood is taken from the part of the umbilical cord that is connected to the placenta, which is why the process is completely painless and neutral for the child and the mother.



## THE STORAGE

By cryopreservation, the stem cells from the baby's umbilical cord can be preserved at very low temperatures (**-196 ° C**). In this way, cells can be stored for years without losing their viability so that they can be used when needed.



## THE APPLICATION

Cord blood stem cells offer an invaluable potential as a therapeutic source for the treatment of **more than 80 diseases**, which have been proven in **more than 60,000 transplantations worldwide**. Umbilical cord blood cells are mainly used for the treatment of oncological diseases, spinal cord deficits, hemoglobinopathies, immune deficiencies and metabolic diseases.

## THERE ARE TWO TYPES OF STEM CELL APPLICATION: AUTOLOGOUS AND ALLOGENEIC

- **Autologous use** – use of own stem cells (1) (2).

This option is preferred for diseases that can be treated with the patient's own stem cells in order to prevent complications due to incompatibility.

- **Allogeneic use** – the patient is treated with stem cells from a compatible person.

The donor may or may not be related to the patient. However, the transplantation success is higher if both (donor and patient) are family members (3).

## THE ADVANTAGE OF FAMILY DONORS

The use of umbilical cord samples between siblings is preferable to that of unrelated donors as it increases the success of the transplant. This advantage is mainly due to the lower incidence of graft-versus-host disease. The probability of complete compatibility between siblings is 25%.



(1) The use of autologous cord blood cannot be recommended for hereditary and/or congenital diseases, due to the risk that the cells may already be affected by the disease. For other diseases, the use of autologous cells is useful to avoid rejection of the transplant and the complications associated with allogeneic transplantation.

(2) Rosenthal et al. (2011) Hematopoietic cell transplantation with autologous cord blood in patients with severe aplastic anaemia: An opportunity to revisit the controversy regarding cord blood banking for private use. *Pediatr Blood Cancer*. 56:1009-12.

(3) Gluckman E et al. (2011) Family-directed umbilical cord blood banking *Haematologica*. 96(11):1700-7.

# PROCESS FROM REGISTRATION TO STORAGE

## 1. REQUESTING THE COLLECTION KIT

Ideally you should register your child for cryopreservation as early as possible before birth. But if the birth is also soon, you can still register. The first step is to order\* the collection kit, either on our website [www.famicord.lu](http://www.famicord.lu), by calling **+41 41 588 05 99** or by sending an email to [kundendienst@famicord.ch](mailto:kundendienst@famicord.ch).

The collection kit also serves as packaging for transport to the laboratory after the birth.



## 2. PREPARE CRYOPRESERVATION

After receiving the collection kit, you should fill out the “clinical questionnaire” and a copy of the contract, which are included in the collection kit, and send it back to us before the birth.



## 3. THE DAY OF BIRTH

Immediately after the birth of the baby and right after the weaning, the medical staff collects the umbilical cord blood, the umbilical cord and the placenta itself. After the birth, the parents report the transport to our special courier, who brings the collection kit to our laboratory. A description as well as contact details are additionally on the collection kit.



## 4. ARRIVAL AT THE LABORATORY

After arrival at the laboratory, the stem cells are processed and stored. At the same time a quality control of the received samples is performed, e.g. test for infections, microbiological analyses.



## 5. STORAGE

After the samples have been processed and analysed, the parents are informed about the result of the cryopreservation of the stem cells. If the sample does not meet the criteria for later use, it will not be cryopreserved and the parents will not be charged for the costs.



## 6. CERTIFICATE

Once the stem cells have been successfully cryopreserved, the parents receive a certificate containing all the information about the samples. The stem cells are stored for a period of 25 years and can be requested at any time upon medical request.



\* For twins, a collection kit should be requested for each baby. Special discount: 50% on the 2nd storage for all services (if both samples have been successfully stored).

# FAMICORD SUISSE – EXPERIENCE & QUALITY

FamiCord Suisse is part of the FamiCord Group. Founded in 2002, it was one of the first family stem cell banks in Europe. From the beginning, FamiCord Group has been fully committed to developing the best cryopreservation solutions and stem cell based therapies. Today, FamiCord Group is the most experienced bank in Europe and the first choice of parents.

## EXPERIENCE

### THE SECURITY OF AN EXPERIENCED BANK

- More than **20** years of experience, part of the largest stem cell bank in Europe, the FamiCord Group
- More than **1'000'000** biological samples stored with us
- Own laboratories** in several European countries
- Strong experience** in the collection, processing as well as the storage and release of human stem cells for therapeutic applications
- Active** in clinical stem cell research for various diseases, is networked with leading transplant centres worldwide and regularly participates in certified clinical trials
- Own laboratories with the possibility to produce **ATMPs**



**IN EUROPE**



**IN THE WORLD**



**STORAGE IN SWITZERLAND**

## QUALITY

### GUARANTEE OF QUALITY

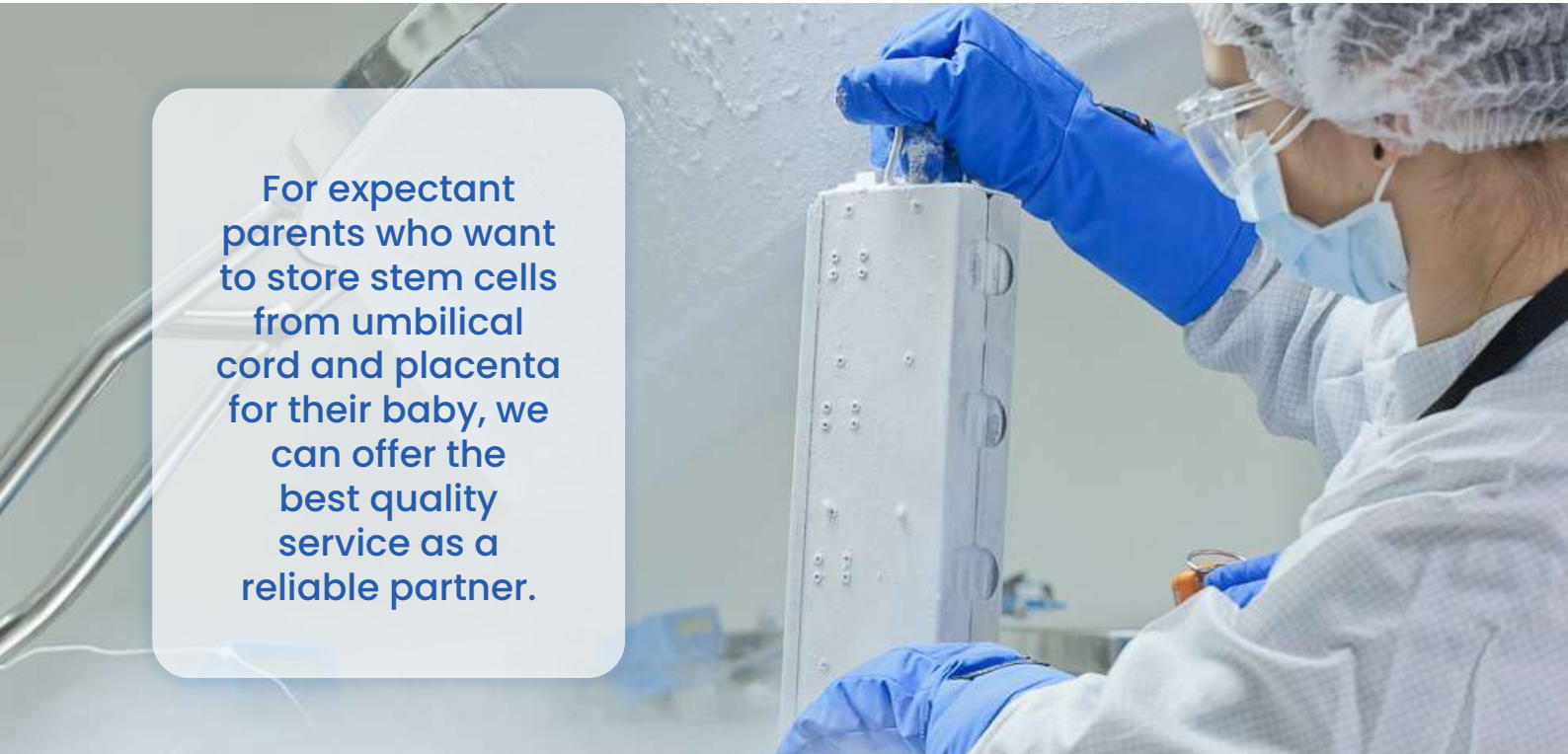
- Licensed by Swissmedic and the Federal Office of Public Health (FOPH)**
- The laboratories of the FamiCord Group also have international accreditations such as AABB and ISO 9001
- Approval from the Food and Drug Administration to provide Stem cells for life-saving transplants for hospitals in the USA
- The only family stem cell bank in Europe that is a member of European Society for Blood and Marrow



**EXPERIENCE**

## FAMICORD – LABORATORY

- With its high number of stored biological samples, the FamiCord Group is currently the largest stem cell bank in Europe and the third largest in the world.
- FamiCord Group has the most experience in Europe in releasing samples for transplantation
- Our laboratory is able and authorized to produce ATMPs (a personalized tissue-based medical product).
- We are present in twenty countries in Europe with our own offices or partner companies.
- Our laboratory is fully specialized in stem cells, state-of-the-art and equipped with the latest equipment.
- FamiCord Group has scientific and medical teams, including medical and diagnostic laboratory staff, transplantation team and a research and development department with the most experienced specialists in the field of stem cell preparation.



**For expectant parents who want to store stem cells from umbilical cord and placenta for their baby, we can offer the best quality service as a reliable partner.**

The way cord blood is collected, transported, processed and stored has a direct impact on the quality of the stem cells and the chance of saving a life during transplantation. Our high standards are confirmed by the following worldwide and local certificates and accreditations:

- Certified in Switzerland by Swissmedic and the Federal Office of Public Health (FOPH)
- AABB – American Association of Blood Banks
- ISO 9001 Certification
- European Association of Family Cord Blood Bank – Certification

# PRICES AND OPTIONS

FamiCord Suisse offers various options for the storage of stem cells from umbilical cord blood, umbilical cord tissue and placenta tissue. The cost of EUR 250 for the collection kit is payable before birth, the remaining costs are only due after successful cryopreservation of the stem cells and are valid for a total of 25 years including storage.

## OUR PACKAGES



### BLOOD STANDARD

1 blood bag with stem cells from the umbilical cord blood is stored



### BLOOD AND TISSUE STANDARD

1 blood bag with stem cells from the umbilical cord blood and mesenchymal stem cells from the umbilical cord tissue will be stored



### BLOOD AND TISSUE PREMIUM

1 blood bags with stem cells from the umbilical cord blood and \*isolated mesenchymal stem cells from the umbilical cord tissue will be stored

\*The standard tissue requires further processing steps to release the tissue cells in a clinical application. In the case of the isolated stem cells, the stored sample needs fewer steps before it can be used, e.g. for a co-transplantation with hematopoietic stem cells to enhance the positive effect of these cells. In addition, the stem cells are simultaneously tested for their ability to multiply in this procedure and we can therefore confirm with certainty that these samples can be used in the future.



### BLOOD, TISSUE AND PLACENTA PLATINUM

1 blood bags with stem cells from umbilical cord blood, isolated mesenchymal stem cells from the umbilical cord tissue and stem cells from placental tissue are stored.

## OUR ADDONS

With our addons, you can adjust the service to your needs for an even greater sense of security.



### HLA TYPING

EUR 450

HLA typing (Human Leukocyte Antigen) is a genetic test used to match patients and donors for bone marrow, cord blood, cells or organ transplants. HLA are proteins, so-called markers, which the immune system uses to recognise which cells belong in your body and which do not. HLA typing, also known as HLA matching, can help determine if potential donors are a good match for recipients. This increases the likelihood of a successful transplant. This is an add-on that tells the parents in advance, when the samples are frozen, what HLA typing the samples have. This gives them the opportunity to match the samples with other samples from siblings, for example, at an early stage.



### TRANSPLANT ASSISTANT

EUR 80

The Transplant Assistant refers to haemopoietic stem cells derived from cord blood and used in the context of standard medical/therapeutic transplants, excluding administrations in the context of experimental medical treatments. As part of the Transplant Assistance Package, FCS provides:

- Consultation with a haematologist or transplantologist
- Transplant HLA test
- Counting of CD 34+ cells and nucleated erythrocytes (from a thawed reference sample)
- Cell viability test and WBC count (from a thawed reference sample)
- Haemopoietic progenitor cell count (from a thawed reference sample)
- Delivery of cells from the site of storage to any transplant centre in the world.



### TRANSPLANT ASSISTANT PLUS

EUR 120

Transplant Assistant Plus refers to haemopoietic stem cells derived from umbilical cord blood and used in the context of standard medical/therapeutic transplants or in the context of experimental medical treatments and to mesenchymal stem cells (MSC) derived from umbilical cord fragments used in the context of experimental medical treatments. As part of the Transplant Assistance Plus package, FCS ensures the following:

a) for standard transplantation of haematopoietic stem cells collected from umbilical cord blood and/or placental blood and for the use of stem cells from umbilical cord blood and/or placental blood in experimental medical treatments:

- an online consultation with the haematologist or transplantologist based on the analysis of the medical records sent by the parents to FCS by e-mail
- Transplant HLA test of the umbilical cord blood
- CD 34+ cell and nucleated red cell count (from a thawed reference sample)
- Cell viability test and leukocyte count (from a thawed reference sample)
- Complete blood count (CBC)
- Haematopoietic progenitor cell count (from a thawed reference sample)
- Delivery of cells from the place of storage to any transplant centre in the world

b) In the event that the stored biological material needs to be used for experimental therapies, customers will receive additional benefits depending on whether the therapy involves the use of cells from umbilical cord blood or mesenchymal stem cells (MSC):

- In the case of MSC cell administration, clients are enrolled in the programme to facilitate access to experimental therapies
- In the case of cord blood stem cell administration, clients will have access to the FamiCord Group Expanded Access Protocol Cord Blood for Brain Development



## REIMBURSEMENT GUARANTEE

EUR 40

If for any reason the collection or storage of the samples is not possible, you will be refunded the money already paid to FamiCord Suisse (basic and service fee). Shipping and guarantee fees are excluded.



## EXTENSION OF THE STORAGE DURATION

Extension for 5 years

EUR 550

EUR 750

EUR 950

EUR 1250

Extension for 10 years

EUR 800

EUR 1000

EUR 1200

EUR 1500

Extension for 25 years





EUR 1550

EUR 1750

EUR 1950

EUR 2250

## SPECIAL OFFERS FOR OUR CUSTOMERS

-  You can divide each option you choose into monthly interest-free instalments. Please contact us for more information about our payment options and special offers.
-  Twins receive a 50% discount on the 2nd twin for all services if both samples are successfully stored.
-  For referrals you will receive a shopping voucher and the person who stores will receive a discount of EUR 150.
-  We offer a loyalty bonus of EUR 300 to all loyal customers.

Note: Discounts are not cumulative.





**+** SWISS KNOW-HOW

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