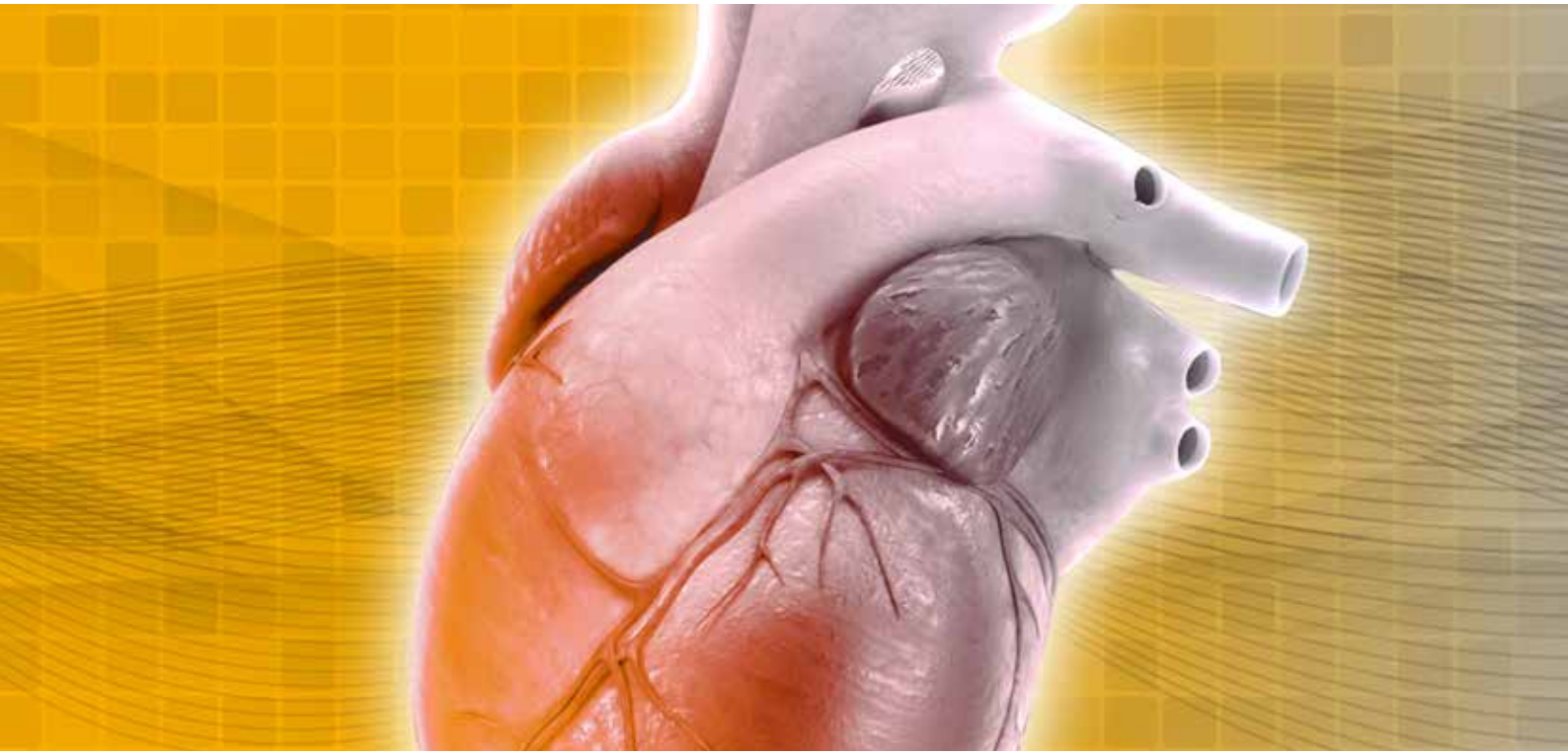
autotissue
leading in cardiovascular tissue engineering



Improving the quality of life

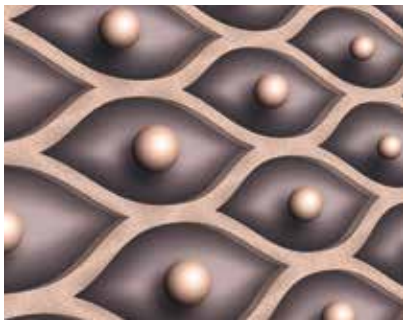
The Matrix Patch™ equine pericardial patch

Our mission:
Leading in cardiovascular tissue engineering

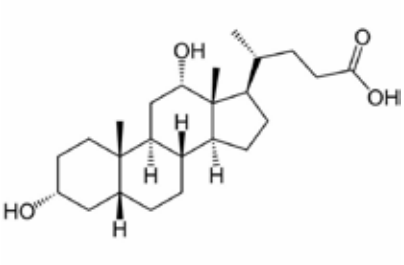
We are a biotechnology company that focuses on the development and manufacture of biological implants. Our cell-free implants minimize the need for long-term medication, which helps to reduce possible negative side effects. This can significantly improve the quality of life, especially for younger patients.

Our technology:
Optimizing immunoreactivity by reducing DNA content

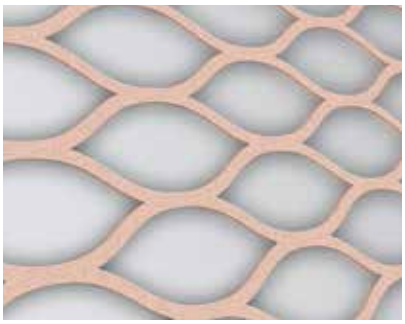
We use a proprietary glutaraldehyde-free process to decellularize and sterilize our tissue implants. This technique reduces residual DNA content to a minimum. After the process, RNA is no longer detectable. Subsequently, the transmission of pathogenic microorganisms is impossible. The complete removal of all xenogenic cells ensures significantly reduced immunoreactivity against our implants.



Native tissue consists of cells, cellular components and an extracellular matrix (ECM). The ECM consists of structural proteins which determine the mechanical properties of the tissue. The cells and cellular components are responsible for the rejection of xenogenic tissue implants.



To prevent rejection and degeneration of the implants, autotissue uses the naturally occurring detergent deoxycholic acid (DOA) during processing to remove all cells and cellular components from the tissue.



Decellularized tissue is characterized by the absence of cell nuclei and a very low residual DNA and RNA content. Due to the very low RNA and DNA content, autotissue implants reveal a high degree of viral safety.

Case Report of Prof. Dr. Boulos Asfour:
Deutsches Kinderherzzentrum

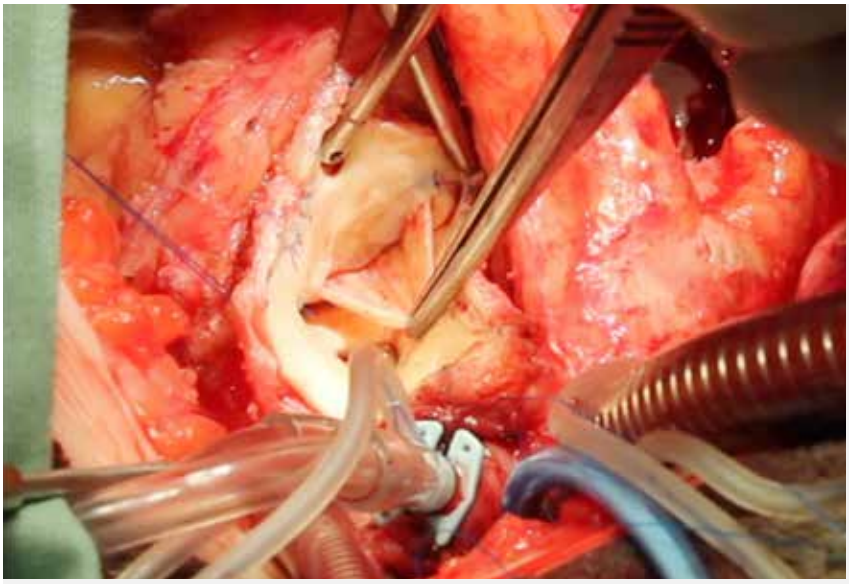
Diagnosis
Critical congenital aortic stenosis

- **May 2005**
  Catheter intervention directly after birth:
  Balloon valvuloplasty.

- **October 2006**
  1st surgery at age of 1 year:
  Aortic valve repair.
  Replacement of right coronary cusp with autologous pericardium.

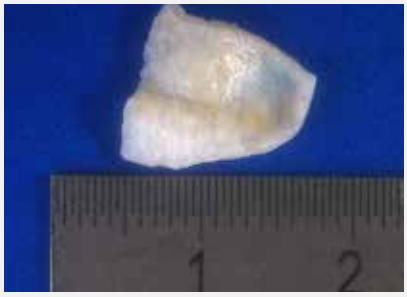
- **September 2012**
  2nd surgery at age of 7 years:
  Redo aortic valve repair due to failure of the autologous pericardial patch. Replacement of the right coronary cusp with a Matrix Patch equine.

- **September 2017**
  3rd surgery at age of 12 years:
  Aortic valve replacement with a mechanical valve (On-X 21 mm) due to retraction of the two native cusps. The Matrix Patch is still pliable and macroscopically free of calcifications.

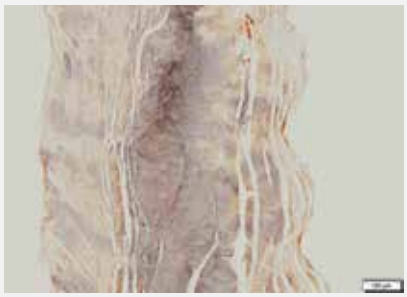


Intraoperative view of the opened aorta demonstrating the pliable and nicely grown-in Matrix Patch™ equine in situ after 5 years.

Macroscopic view of half of the explanted right-coronary patch (Matrix Patch™ equine).



The von-Kossa staining confirms complete absence of any calcification.



The von-Willebrand staining shows a thin endothelial layer.

Histology: Courtesy of Prof. Dr. Matthias Sigler
Department of Cardiac Surgery, University of Göttingen.

Vergnat M, Asfour B, Arenz C et al. Aortic stenosis of the neonate: A single-center experience. J Thorac Cardiovasc Surg. 2019;157:318-326.e1.

Vergnat M, Asfour B, Arenz C et al. Contemporary results of aortic valve repair for congenital disease: lessons for management and staged strategy. Eur J Cardiothorac Surg. 2017;52:581-587.

Hraška V, Sinzobahamvya N, Haun C et al. The long-term outcome of open valvotomy for critical aortic stenosis in neonates. Ann Thorac Surg. 2012;94:1519-1526.

The Matrix Patch™ is available in the following sizes

- 10 x 5 cm Article No. 42 505 306 041 55
- 10 x 2 cm Article No. 42 505 306 041 24
- 8 x 8 cm Article No. 42 505 306 048 89
- 8 x 4 cm Article No. 42 505 306 048 41
- 5 x 5 cm Article No. 42 505 306 040 56
- 3 x 3 cm Article No. 42 505 306 043 39

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