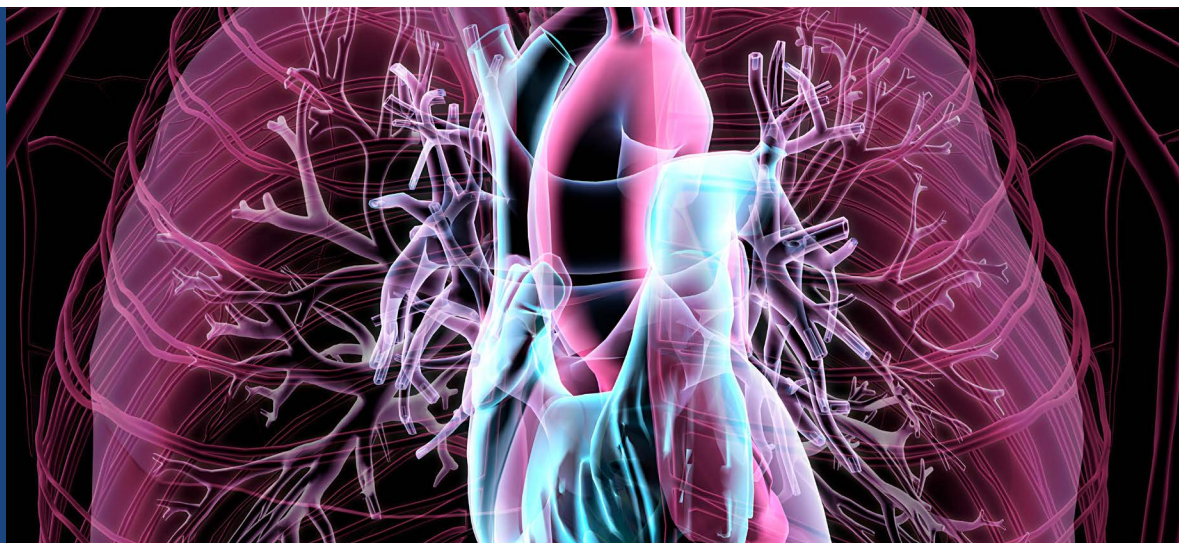


Summary

Charles River's team of structural heart specialists have over 150 years of combined experience with interventional cardiology, imaging, and sophisticated techniques for the delivery, animal treatment, and functional evaluation of implanted heart valves and related devices.



SAFETY ASSESSMENT

Structural Heart Studies

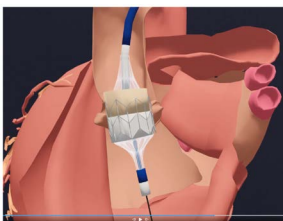
Learn more about
our **Cardiovascular
Medical Device Services**

Surgical Expertise and Experience

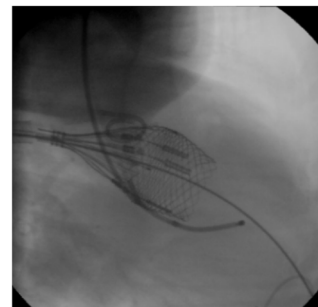
Charles River is well versed in the preclinical assessment of medical devices that treat or cure structural heart defects. Such devices typically target the anatomical structures such as heart valves or conduits between chambers of the heart.

To ensure the safety of a structural heart device, specific aspects need to be evaluated in preclinical studies. In addition to assessing biocompatibility and local cellular reaction to the implant, it is equally important to test acute device performance, deliverability, and ease of use. With more than 10 years of experience in the field, our Medical Device Services team can effectively guide study designs and establish the appropriate endpoints. Highly skilled interventional cardiologists and technicians perform the specialized delivery procedures and related animal care and husbandry associated with surgery/anesthesia for a positive outcome. In-house imaging specialists can perform the functional evaluation of the devices (migration, flow, regurgitation, etc.)

As every medical device and delivery system is unique, we will propose the appropriate early stage pilot study to improve every step in the delivery of each device. This critical preliminary step ensures the success of later large scale GLP safety studies that follow, effectively achieving time and cost savings across the entire program.



Transcatheter aortic valve implantation (TAVI)



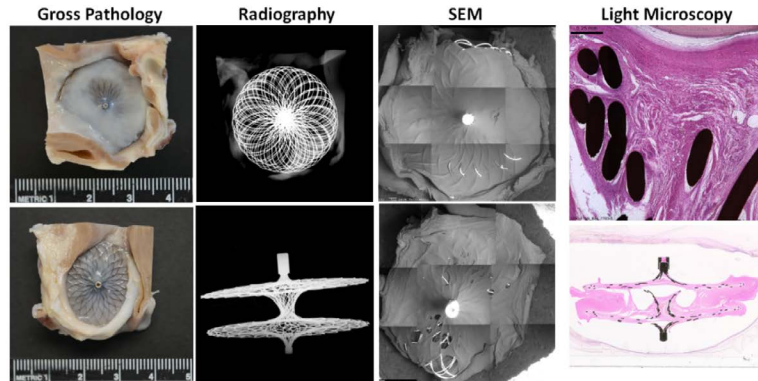
Aortography of an aortic valve prior delivery

EVERY STEP OF THE WAY

Contact our team
to get started

Specialized Histopathology

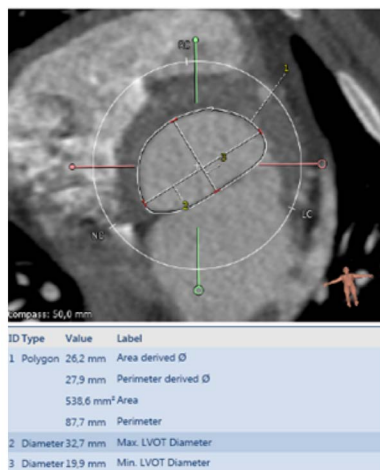
At the end of the study, the proper harvest of the samples, gross pathology evaluation, and preservation of samples are all essential to perform quality histology and conduct a full evaluation of the outcome (migration, injury, tissue reaction). Our specialized veterinary pathologists and necropsy technicians are skilled in the processing of very large samples for microscopy and pathology evaluation such as a cardiac valves and closure devices. Plastic embedding with micro-grinding on large sections is used to prepare microscopy sections from metallic implants for evaluation of calcification, inflammation, endothelial covering and more.



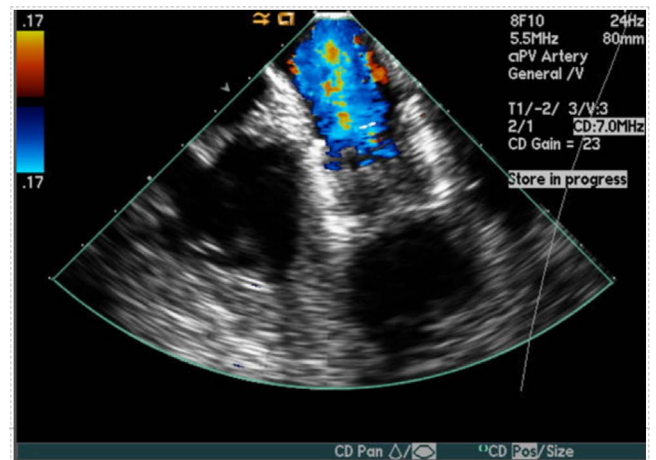
Histopathology imaging of a closure device

Facilities, Models and Equipment

The success of a structural heart preclinical study depends on the selection of the correct animal model, most often determined by anatomical size. Using CT scanning or echocardiography and the proper analysis tools, our team will conduct a pre-screening evaluation to ensure the most appropriate anatomical match for the tested medical device. Charles River's medical device testing facilities feature two fluoroscopic suites for these purposes. Procedures can be supported by cardiac echocardiography (TTE, TEE, or ICE). Echocardiography is also used in follow-up imaging for the functional evaluation of the implant.



Aortic measurements of a CT scan



Echocardiography of an aortic valve

EVERY STEP OF THE WAY

Publications and Presentations

Krzysztof Milewski, Roland Fiszer, Piotr P. Buszman, Przemysław Węglarz, Adam Janas, Agata Krauze, Michał Jelonek, Piotr Hirnle, Grzegorz Smolka, Robert Gil, Jacek Białkowski, Paweł E. Buszman. Temporal healing patterns and coverage dynamics after new Polish transcatheter PFO occluder implantation in a swine. *Kardiologia Polska* (2017) 75(9): 907-913.

Jeannot Potvin, Dongming Hou, Elena Ladich, Barbara Huibregtse, Renu Virmani, Keith Dawkins, Amelie Bouchard, Guy LeClerc. Hemodynamic and biology response of a full repositionable and retrievable TAVI system in a sheep model. Poster presentation at CIT (China Interventional Therapeutics), Beijing, China, March 17-20, 2016.

Guy Leclerc. Myval science and pre-clinical update. Oral presentation at the Meril Symposium during India Live 2015, Chennai, India, February 27, 2015.

Jeannot Potvin, Renu Virmani, Elena Ladich, Dongming Hou, Crystal Anderson-Cunanan, Barbara A Huibregtse, Keith D Dawkins, Guy LeClerc. Hemodynamic evaluation of a fully repositionable TAVI system in a novel chronic ovine model of transfemoral orthotopic aortic valve implants. Poster presented at EuroPCR, Paris, France, May 20-23, 2014.

Elena Ladich, Barbara Huibregtse, Keith Dawkins, Guy Leclerc, Dongming Hou, Amelie Bouchard, Jeannot Potvin, Renu Virmani. Pathology of explanted aortic valves previously deployed in the orthotopic position in an ovine TAVI model. Poster presented at EuroPCR, Paris, France, May 20-23, 2014.

Jeannot Potvin, Keith D Dawkins, Dominic J Allocco, Amelie Bouchard, Robert Chang, Barbara Huibregtse, Lise Lachance, Guy LeClerc. Transcatheter orthotopic aortic valve implantation in sheep: chronic survival and valve performance evaluation. Poster presented at TCT in October 2013 (Selected in TCT top 50 poster). Abstract published in *Journal of the American College of Cardiology*. 2013; 62: B247.

Contact our team to get started.