Protheragen
Cardiovascular Diseases

Tailored Solutions for Rare Cardiovascular Disease Therapeutic Development

Contact Us

info@protheragen.us

www.protheragen.us/cardiovascular-disease/

1-631-533-2057

101-4 Colin Dr, Holbrook, NY 11741, USA

Overview

About Us

Protheragen
Cardiovascular Diseases

Your Trusted Preclinical Research Service Provider for Rare Cardiovascular Disease Drug Development

Protheragen is a leading, full-service solutions provider, specializing in the development of drugs and therapies for cardiovascular diseases. We advance and expedite the development of rare cardiovascular disease drugs by offering state-of-the-art solutions and services to innovators globally.

01 **Integrated**
A comprehensive suite of services covers every aspect of drug development, ensuring a cohesive approach to research and innovation.

02 **Professional**
A team of highly skilled professionals is dedicated to maintaining the highest standards of quality and ethics in all endeavors.

03 **Experienced**
With years of expertise and project experience in cardiovascular research, we bring deep knowledge and insights that drive successful outcomes.

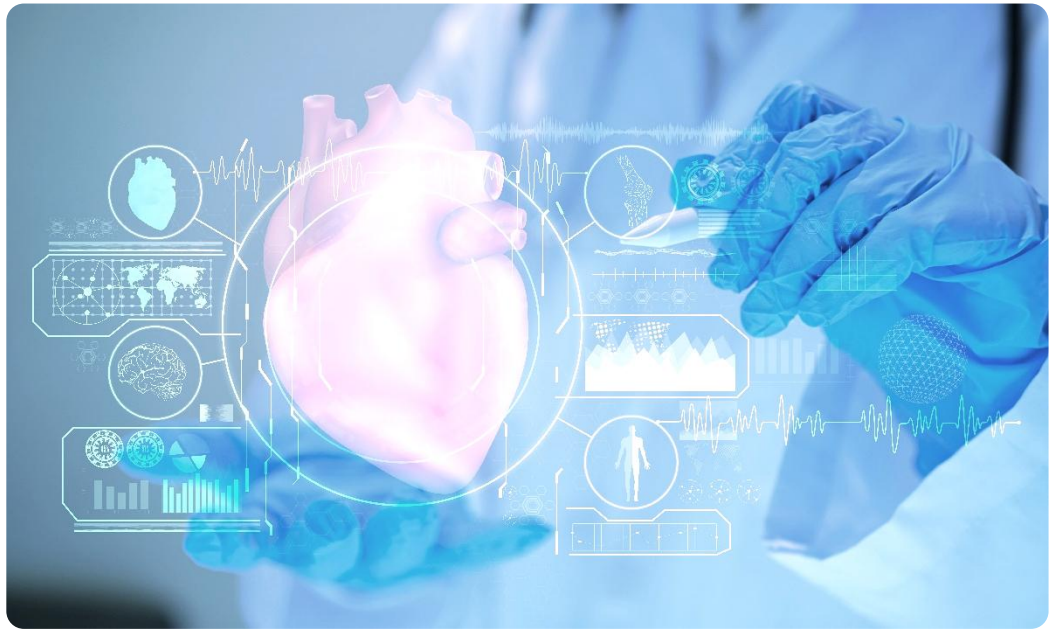
04 **Efficient**
Optimized processes, cutting-edge technologies, and customized strategies enable swift delivery of results while upholding exceptional quality.

Disease Areas of Focus

About Us

Protheragen
Cardiovascular Diseases

Rare cardiovascular diseases encompass a diverse range of conditions that affect the heart and blood vessels, which can include congenital heart defects, rare forms of cardiomyopathy, and specific vascular disorders. Protheragen provides tailored drug development solutions specifically designed for rare cardiovascular disease research across various categories. Our approach combines innovative methodologies and expertise, ensuring that each solution is customized to meet the specific needs of our clients.



Rare Cardiovascular Diseases

- Rare Arrhythmias
- Rare Cardiomyopathies
- Rare Cardiac Tumors
- Rare Congenital Heart Diseases
- Rare Vascular Diseases
- Other Cardiovascular Diseases

Customized Solutions

Protheragen
Cardiovascular Diseases

Diagnostic Development

- Biomarker Development Services
- *In Vitro* Diagnostic (IVD) Kit Development Service

Disease Model Development

- Cell-based Model Development
- Organoid Model Development
- Animal Model Development

Clinical Research Services

- Investigator Initiated Trial (IIT) Services
- IND/NDA/BLA Application
- Patient Recruitment
- Biostatistics and Programming
- Other Services

01 02 03 04 05

Therapeutic Development

- Small Molecule Drug
- Cell Therapy
- Gene Therapy
- Therapeutic Antibody
- Therapeutic Peptide
- Therapeutic Protein

Preclinical Research

- Pharmacodynamics
- Pharmacokinetics
- Drug Safety Evaluation

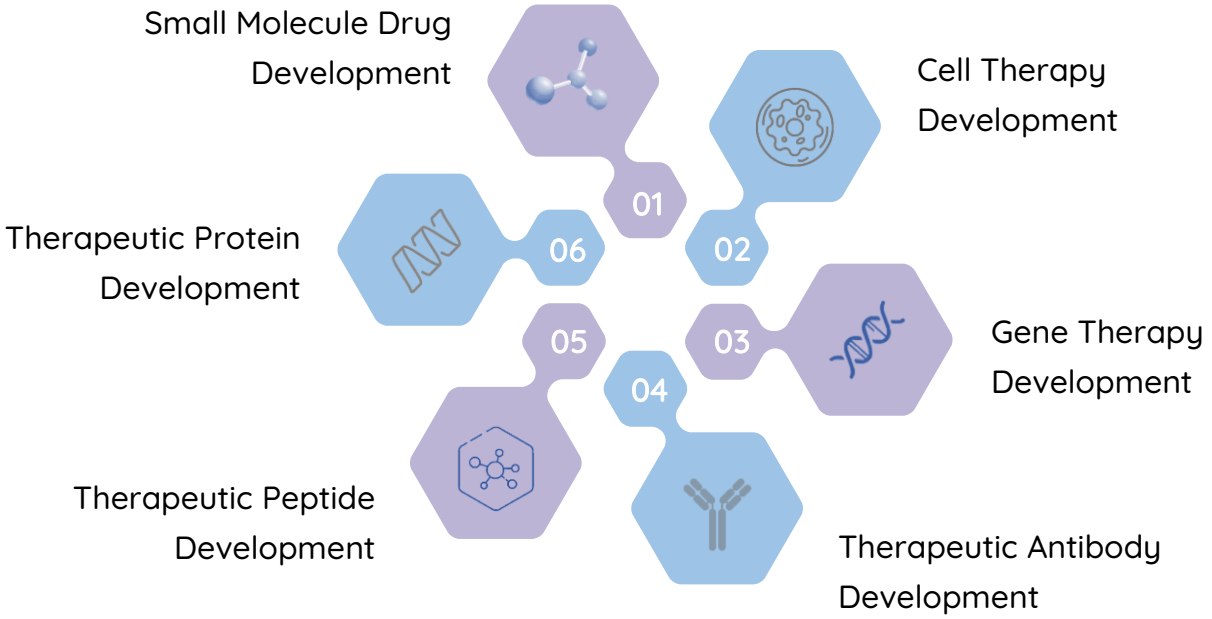
Protheragen's experienced team works with you to simplify drug development, from initial concepts through preclinical trials to clinical research.

Therapeutic Development

Our Services

Protheragen offers a one-stop solution for drug discovery and development. By integrating our expertise and cutting-edge technologies, we provide tailored support to accelerate the discovery and development of innovative therapeutics for these challenging conditions.

Diversified Therapeutic Development Platforms



01

Target Identification

Research is conducted to understand rare cardiovascular diseases and identify potential therapeutic targets through molecular studies.

02

Drug Discovery

High-throughput screening is employed to find promising lead compounds and optimize drug candidates with computational tools.

03

***In Vitro* Studies**

Pharmacological properties and mechanisms of potential therapies assessed using advanced *in vitro* models.

04

***In Vivo* Evaluation**

Animal models are utilized to evaluate the efficacy and safety of drug candidates in a complex physiological setting.

Disease Model Development

Our Services

Protheragen
Cardiovascular Diseases

Tailored Disease Model Development Services

By leveraging advanced technologies and expertise, Protheragen specializes in developing models for rare cardiovascular diseases, providing researchers with essential tools to study these conditions. We create highly customized models that accurately mimic the disease mechanisms, allowing for more effective drug discovery and development.

01

Cell-based Model Development Service

- Cell Line Development
- Primary Cell Development
- iPSC-derived Cell Model Development

02

Organoid Model Development Service

- 3D Bio-printed Organoids
- Self-assembling Organoids
- Microfluidic Organ Chips
- Tissue-Engineering Models

03

Animal Model Development Service

- Genetically Engineered Animal Models
- Surgical Animal Models
- Induced Animal Models
- Transplant Animal Models

Disease Model Development

Our Services

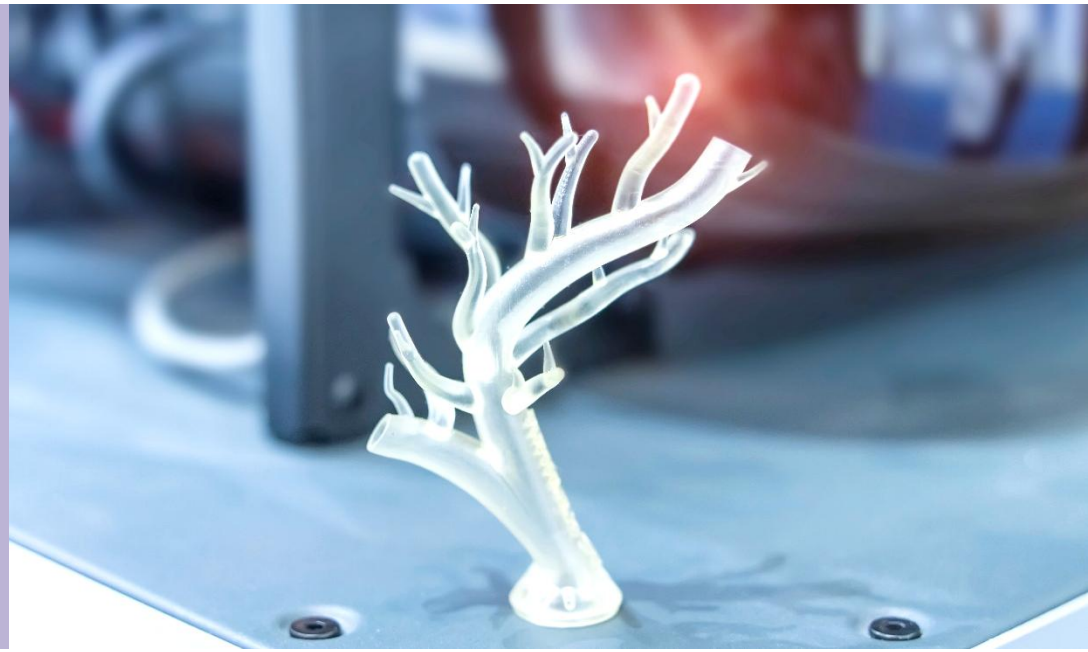
Protheragen
Cardiovascular Diseases

Organoid Model Development Services

Leveraging advanced 3D culture technology, Protheragen has cultivated various organoid types. Our expert team provides tailored organoid model development services to simulate rare cardiovascular diseases, accelerating therapy research and development.

Cardiovascular Organoid Cell Sources

- Induced pluripotent stem cells (iPSCs)
- Embryonic stem cells (ESCs)
- Adult stem cells (ASCs)



3D Bio-printed Organoids

Utilizing 3D bioprinting constructs tissue layer by layer, offering precise control over tissue structure and cell distribution.

Microfluidic Organ Chips

Microfluidic chips feature living cells in microchannels, mimicking human organ structure and nutrient flow.

Self-assembling Organoids

Organoids form from self-assembling stem or organ-specific cells into 3D structures reflecting organ function.

Tissue Engineering Models

Tissue engineering combines cells and biomaterials to create constructs that mimic cardiovascular organ anatomy.

Disease Model Development

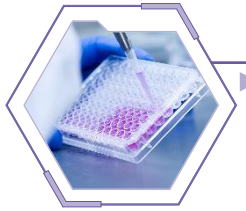
Our Services

Protheragen
Cardiovascular Diseases

Organoid Model Development Services

Construction of organoid models

- Multiple cell combinations
- Fully functional



Validation of organoid models

- H&E staining
- Immunohistochemical staining
- Immunofluorescence staining
- Single-cell sequencing
- Others

Applications

- Mechanism research
- Disease modeling
- Drug screening
- Drug safety evaluation
- Other applications

Case Study of Cardiac Organoid Model Development

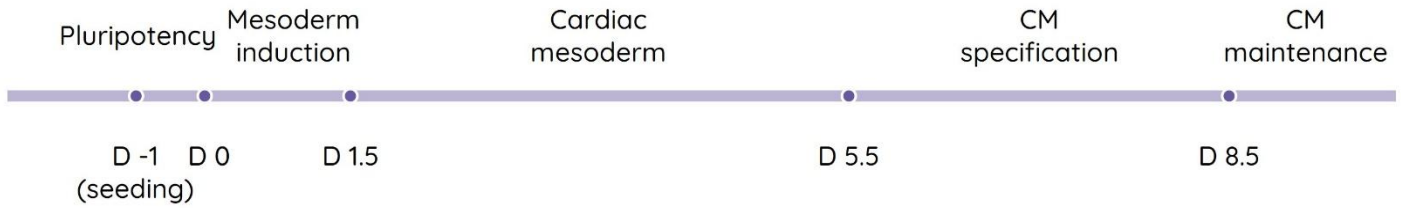


Fig.1 Process for constructing cardiac organoid models.

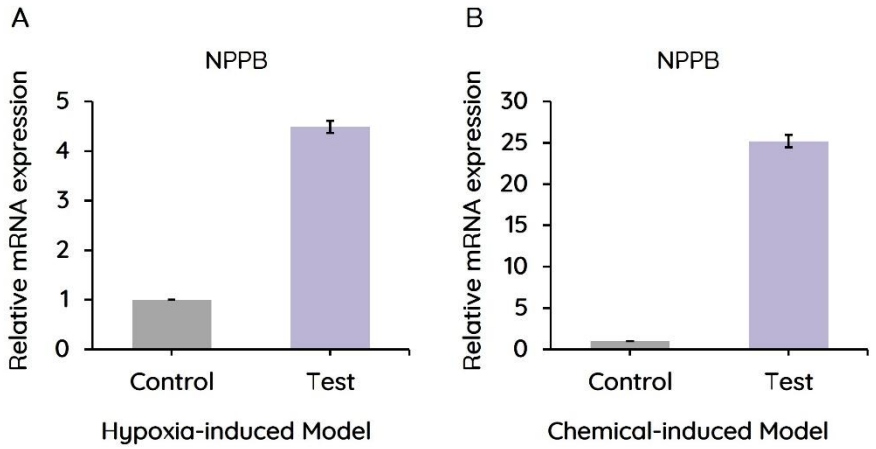


Fig.2 Heart failure organoid models. Through chemical or hypoxia induction, we developed two cardiac organoid models for heart failure. Results showed decreased myocardial contractility and increased NPPB levels in both models, confirming their successful construction.

Disease Model Development

Our Services

Protheragen
Cardiovascular Diseases

Animal Model Development Services

Protheragen offers a robust animal model development platform that showcases a diverse array of disease models. This flexibility empowers you to select the most appropriate animal model tailored to your specific research needs, ensuring efficient and reliable studies on rare cardiovascular diseases.

- Genetically Engineered Animal Models
- Induced Animal Models
- Surgical Animal Models
- Transplant Animal Models

Animal Models for Rare Cardiovascular Disease

- Rare Arrhythmias
- Rare Cardiomyopathies
- Rare Congenital Heart Diseases
- Rare Vascular Diseases
- Rare Cardiac Tumors
- Other Cardiovascular Diseases

Optional Animal Species

- Mouse models
- Rat models
- Rabbit models
- Porcine models
- Zebrafish models
- And more

Disease Model Development

Our Services

Protheragen
Cardiovascular Diseases

Animal Models for Cardiovascular Diseases

Model Names	Cardiovascular Diseases	Model Types
Bmpr2-KO Model	Pulmonary Arterial Hypertension (PAH)	Genetically Engineering Model
Sugen/Hypoxia-induced Model	Pulmonary Arterial Hypertension (PAH)	Environmental or Stress-induced Model
Monocrotaline-induced Model	Pulmonary Arterial Hypertension (PAH)	Chemical-induced Model
Kcnh2-KO Model	Long QT Syndrome	Genetically Engineering Model
Tbx5-KO Model	Holt-Oram Syndrome	Genetically Engineering Model
Scn5a-KO Model	Brugada Syndrome	Genetically Engineering Model
Ldlr-KO Model	Familial Hypercholesterolemia (FH)	Genetically Engineering Model
HCHF Model	Familial Hypercholesterolemia (FH)	Diet-induced Model
Mybpc3-KO Model	Hypertrophic Cardiomyopathy (HCM)	Genetically Engineering Model
Myosin-induced Model	Autoimmune Myocarditis	Immunologically-induced model
TAC Animal Model	Heart Failure	Surgical Model

For more information about these or other animal model development services for cardiovascular diseases, please contact us.

Disease Model Development

Our Services

Protheragen
Cardiovascular Diseases

Case Study of Mybpc3-KO Animal Model Development

Cardiac myosin-binding protein C (cMyBP-C) is a cardiac sarcomeric accessory protein encoded by the *Mybpc3* gene. The *Mybpc3* gene mutation in homozygous mice leads to the development of dilated cardiomyopathy (DCM). Protheragen created a *Mybpc3* knockout mouse model using gene editing techniques to simulate human HCM and DCM. The model specifically deleted exons 2-22 of the *Mybpc3* gene, which results in the absence of the MYBPC3 protein.

Applications of Mybpc3-KO Model

- Screening and efficacy testing of drugs targeting HCM or DCM.
- Research on the mechanisms of diseases related to MYBPC3 deficiencies, such as myocardial hypertrophy and ventricular dilation.

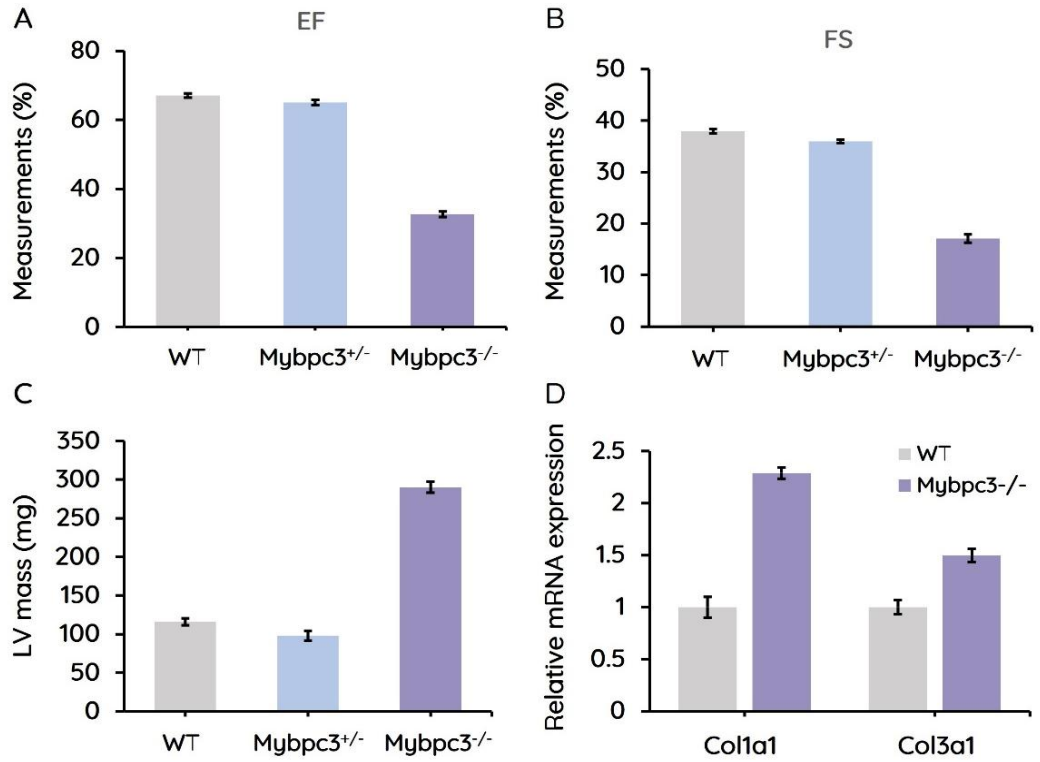


Fig.3 *Mybpc3*$^{-/-}$ mice exhibited decreased ejection fraction (EF) and fractional shortening (FS), alongside increased left ventricular (LV) mass, indicating left ventricular dilation, myocardial hypertrophy, and reduced contractility (Fig.3A-C). Quantitative RT-PCR revealed significant upregulation of fibrosis markers, such as Col1a1 and Col3a1, in *Mybpc3*$^{-/-}$ mice. (Fig.3D).

Preclinical Research

Our Services

As a leading provider of preclinical research services for rare cardiovascular disease drug discovery and development, Protheragen offers a variety of tailored solutions to meet the unique needs of our clients.

- √ Efficacy Evaluation
- √ Safety Assessment
- √ Dose Optimization
- √ Mechanism of Action Studies
- √ Regulatory Compliance

Pharmacodynamics

Pharmacodynamics examines how a drug affects a biological system and influences disease, identifying mechanisms of action and potential side effects in both *in vivo* and *in vitro* settings.

01

Drug Safety Evaluation

Drug safety evaluation assesses a drug's safety and potential adverse reactions, allowing us to identify and manage safety risks to ensure candidate drug safety.

02

Pharmacokinetics

Pharmacokinetics studies the absorption, distribution, metabolism, and excretion of a drug, helping to understand its dynamic changes in the body and determine optimal dosage and frequency.

03

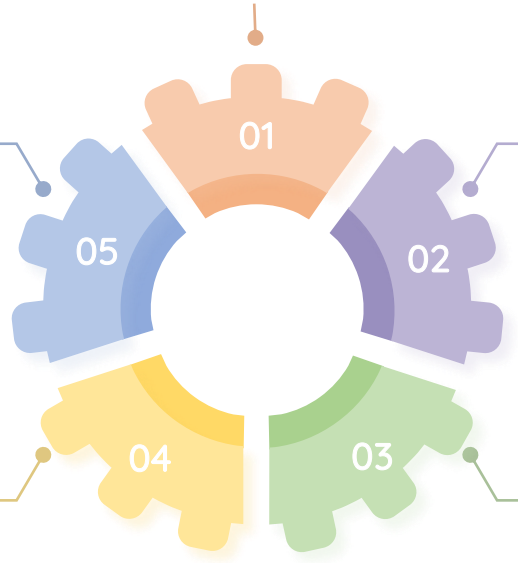
Clinical Research Services

Our Services

Protheragen
Cardiovascular Diseases

One-stop Investigator Initiated Trial (IIT) Services

Compliance Approval
The initial phase focuses on obtaining regulatory approvals to ensure meet ethical and legal standards.



Recruitment and Screening
The screening process is thorough to ensure a representative study population.

Data Collection
Collaboration with hospitals facilitates clinical data collection using advanced equipment and protocols.

Quality Control
Rigorous quality control measures are implemented, including regular audits and data monitoring.

Service Delivery
Timely delivery of research results is ensured and protects the integrity and confidentiality of the data.

Clinical Research Services

- Investigator Initiated Trial (IIT) Services
- Medical Writing Services
- IND/NDA/BLA Application Strategy
- Patient Recruitment
- Biostatistics and Programming
- Quality Management Services
- Medical Monitoring Services
- Safety and Pharmacovigilance Services
- Data Management Services
- Project Management Services

Featured Products

Protheragen Cardiovascular Diseases

Protheragen boasts a wide global network of products, including biofluid samples, tissue samples, cardiovascular system cells, and molecular products. Committed to delivering premium, ethically sourced research materials, we aim to meet the evolving needs of the cardiovascular disease research community.




Biofluid Samples

Biofluid samples are essential for cardiovascular disease diagnostics and therapy development, including various blood components (whole blood and derivatives) and other biofluids.

Tissue Samples

Specializing in superior and diverse normal donor or diseased cardiovascular tissue specimens, we cater to the exacting requirements of scientific inquiry.

Cells of the Cardiovascular System

A range of cardiovascular system cells accurately reflects disease pathology, offering researchers a reliable model for studying cardiovascular conditions.

Molecular Products

Extensive molecular products are available, specifically designed for preclinical research on cardiovascular diseases, including proteins, antibodies, and molecular assay kits.

Protheragen
Cardiovascular Diseases

One-Stop Services for Rare Cardiovascular Disease Drug Research and Development

Contact Us

info@protheragen.us

www.protheragen.us/cardiovascular-disease/

1-631-533-2057

101-4 Colin Dr, Holbrook, NY 11741, USA