

WHAT IS COLMAH?



COLMAH* is the biobank of human arterial tissue collected by the HERACLES* Program of the Spanish Cardiovascular Research Network, linked to a cross-referenced database with advanced search capacity. The goal is to offer an exceptional tool for basic, applied and translational research on the epidemiology, pathophysiology, diagnosis and treatment of cardiovascular diseases.

KEY CHARACTERISTICS

- The largest collection in Spain of human vascular samples, from a wide variety of vascular beds.
- Pertinent clinical data from all tissue donors.
- Rigorous protocols.
- State-of-the-art technologies, including:
 - Cryopreservation of arterial rings for morphometric & immunohistochemical studies.
 - RNAlater® storage of arterial tissues for sequential extraction of RNA, DNA & proteins from endothelial or vascular smooth muscle cells.
 - Extraction of primary cell lines from endothelial & smooth muscle explants for use in expression & functional studies.

WHY COLMAH IS UNIQUE

COLMAH develops primary cultures from endothelial and vascular smooth muscle cells from healthy donors and from patients with vascular diseases. These cells are expanded, cryopreserved and identified with a barcode that links each sample to donor characteristics in a regularly updated central database. This powerful, searchable combination of tissue and data holds enormous potential for research in the field of vascular physiology and pathophysiology.

*COLMAH: COlección de Muestras Arteriales Humanas (Human Artery Samples collection).

*HERACLES: Hipertensión Esencial: Red de Análisis de Canales iónicos de la musculatura lisa arterial y su Explotación terapéutica Sistemática. (Essential Hypertension: Analysis of Ion Channels Mechanisms in Arterial Smooth Muscle and Their Systematic Therapeutic Applicability).

COLMAH AT A GLANCE



Patients
Organ donors
Umbilical cords

DONORS



DNA
RNA & proteins
Frozen tissue
Cell lines
Clinical data (patients, healthy donors, newborns)

SAMPLES & DATA



High-capacity freezers for sample storage
Database management
Statistical analysis
Coordination of secure sample shipment

STORAGE, ANALYSIS & COORDINATION



Basic biomedical sciences
Genetic expression
Phenotype-genotype correlations
Diagnostic & treatment biomarkers
New therapeutic targets and drugs
Personalized medicine

BIOMEDICAL RESEARCH APPLICATIONS



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WHY COLMAH?



COLMAH addresses the need for research access to matched samples of healthy and diseased tissues, as well as to clinical data about the patients and healthy donors, for studies of the molecular and genetic basis of vascular disease.

Macroscopic vascular disease becomes evident after a long period of clinically silent vascular dysfunction, as in patients with one or more risk factors - hypertension, diabetes, dyslipidemia, and other genetic and environmental factors - involved in vascular lesions. However, changes at the cellular level can be detected years before onset of clinical vascular disease.

Access to a collection of arterial tissues is an indispensable tool to characterize disease stages, establish the relative contribution of the different risk factors, identify early biomarkers of the disease, and design new therapies targeting specific mechanisms.

WHAT COLMAH AIMS TO DO

- Analyze the impact of risk factors and cardiovascular biomarkers on the gene expression profile of the vascular tissues.
- Launch functional studies to characterize the molecular mechanisms underlying cardiovascular diseases, using primary cell cultures obtained from vascular tissues.
- Study the direct contribution of genetic and environmental factors to vascular function.
- Identify new therapeutic targets, characterize new vascular drugs, and determine individual response to treatment.

HOW COLMAH WORKS



- **HERACLES** Program researchers obtain arterial tissues from donors, together with the relevant clinical data.
- **COLMAH** protocols for data management and for tissue collection, coding, transport and storage are coordinated in Barcelona, ensuring standardized quality and uniformity of procedures.
- Samples are coded to identify the participating medical center and sample type.
- Anonymized clinical data are entered in a relational database and permanently associated with the sample code.
- Samples are stored using a precise, detailed protocol.
- IMIM coordination center dispatches samples by express courier to HERACLES Program laboratories in Valencia and Valladolid.
- Each laboratory carefully processes and stores samples according to established COLMAH protocols.



WHAT SAMPLES ARE AVAILABLE



Arterial tissue samples (patients & healthy donors)
DNA, RNA and protein extracts from these samples
primary cultures expanded from endothelial and smooth muscle layers from arterial types, including:

- Uterine, renal and coronary arteries.
- Saphenous veins.
- Umbilical cords.
- Aortas, and others.



WHO CAN USE THE SAMPLES

COLMAH is a non-profit initiative at the service of the scientific community. Interested researchers must present a written research proposal for evaluation by the HERACLES Program executive board. The quality, feasibility and expected impact of the project are taken into account before the use of **COLMAH** samples can be authorized.

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