



HAL
open science

INSTITUT COCHIN ENTITY DMP - PIV Core Facility

Gilles Renault, Thomas Guilbert

► **To cite this version:**

Gilles Renault, Thomas Guilbert. INSTITUT COCHIN ENTITY DMP - PIV Core Facility. Institut Cochin, Inserm U1016, CNRS UMR 8104, Université Paris Cité, F-75014 Paris, France. 2024, <https://institutcochin.fr/plateformes/piv>. hal-04834265

HAL Id: hal-04834265

<https://hal.science/hal-04834265v1>

Submitted on 12 Dec 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

INSTITUT COCHIN ENTITY DMP - PIV

Plan de gestion de données créé à l'aide de DMP OPIDoR, basé sur le modèle "Science Europe: structured template for research entities" fourni par DMP OPIDoR.

Plan Details

Plan title	INSTITUT COCHIN ENTITY DMP - PIV	
Deliverable		
Version	First version	
Plan purpose/scope	<p>The aim of this DMP is to describe as precisely as possible the various research products produced by the services offered by the core facility. This DMP is part of a wider framework, that of making available all the DMPs of the 9 Institut Cochin core facilities (MOUSET'IC, PROTEOM'IC, PIV, PIME, METABOL'IC, CYBIO, IMAG'IC, GENOM'IC and HISTIM) as well as the DMP of the CID database dedicated to the transfer, storage, consultation and sometimes processing of most of the data produced by the Institut Cochin's core facilities.</p> <p>The purpose of this DMP entity is to provide drafting assistance for researchers wishing to draw up a DMP for their research projects and wishing to call on the expertise of our core facilities.</p>	
Fields of science and technology (from OECD classification)	1.6 Biological sciences	
Language	eng	
Creation date	2024-07-18	
Last modification date	2024-12-12	
Identifier type	DOI	
License	Name	Creative Commons Attribution 4.0 International
	URL	http://spdx.org/licenses/CC-BY-4.0.json

Structure Details

Entity's name Institut Cochin Core Facility - PIV
Acronym PIV
Identifier <https://institutcochin.fr/plateformes/piv>
Identifier type URL

Description

The core facility handles the various phases of your in vivo imaging projects: advice on experimental design, image acquisition and analysis, and delivery of results. It has the facilities to house animals for the duration of the study.

The platform is part of the Université Paris Cité's Plateforme Imageries du Vivant (PIV), which brings together all the pre-clinical imaging modalities at university level (μ IRM, μ CT, μ TEP, iRPE, etc.) as well as a number of clinical imaging research modalities.

Creation date 2005-12-01

Research outputs :

1. Measurements and associated calculations (Dataset)
2. Images (Image)

Contributors

Name	Affiliation	Roles
Bibaki Giovanna	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • Data Collector (Measurements, Images, Measurements, Images)
Guilbert Thomas - 0000-0001- 5069-0730	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • DMP manager
Lager Franck	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • Data Collector (Measurements, Images, Measurements, Images)
Lagoutte Isabelle	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • Data Collector (Measurements, Images, Measurements, Images)
Monbernard Pierre	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • Data Collector (Measurements, Images, Measurements, Images)
Renault Gilles - 0000-0003- 2273-1229	Institut Cochin - 051sk4035	<ul style="list-style-type: none"> • Contact Person (Measurements, Images) • DMP Manager (Measurements) • Data Collector (Measurements) • Entity's Manager (Measurements, Measurements, Images, Images, Images, Images, Measurements, Measurements, Measurements, Measurements, Images, Images, Images, Measurements, Images, Images) • Entity's manager

INSTITUT COCHIN ENTITY DMP - PIV

Data description and collection or re-use of existing data

Measurements and associated calculations

Research output description

Name	Measurements and associated calculations
Description	Measurements performed in Image acquisitions : Anatomical dimensions (length, surface, Volume) Velocities (peak velocities, mean velocities, gradients, time intervals) Associated functional or anatomical parameters (Volume, Ejection Fraction, Cardiac output) Deformation related informations (strain and strain rate) Doppler-related informations (Percentage of pixels showing flow from Power Doppler), Velocities Optoacoustic signal Contrast uptake values Bioluminescence signal parameters (photon flux)
Type	Dataset
Workpackage	
Keywords (free-text)	in vivo imaging, ultrasound, bioluminescence, Doppler
Language	eng
Issued Date	
May contain personal data?	No
May contain sensible data?	No
May take ethical issues into account?	Yes

Will existing data be reused?

Justification May be used by third-party researchers and complementary analyses

How new data will be collected or produced?

Name of the method	In vivo Imaging
Description	From acquired image datasets, various softwares allow to produce measures. These measurements are summarized in tablesheet.
Data Nature	Experimental Data
Equipments, technical platforms used	<ul style="list-style-type: none"> • PIV : https://cat.opidor.fr/index.php/PIV

Images

Research output description

Name	Images
Description	<ul style="list-style-type: none"> • Ultrasound images or image sequences (Bmode, Power and color Doppler images, Contrast ultrasound images, optoacoustic images, all in 2D or 3D) • Time-motion images (TM mode) • Pulsed Doppler flow (velocity x time) • Bioluminescence images (2D photo, and overlay of photon flux)
Type	Image
Workpackage	
Keywords	<ul style="list-style-type: none"> • bioluminescence (Thésaurus INRAE) • échographie (Thésaurus INRAE)
Keywords (free-text)	
Issued Date	
May contain personal data?	No
May contain sensible data?	No
May take ethical issues into account?	Yes

Will existing data be reused?

Justification Images or image sequences are rarely used but can be. For further measurements or quantification.

How new data will be collected or produced?

Name of the method

Ultrasound and bioluminescence Imaging

Description**Ultrasound Imaging :**

Data will be acquired using various ultrasound Machines. In most research project, images are acquired on anesthetized animals, but acquisitions can be performed to explore some soft material properties. Briefly ultrasound imaging devices emit ultrasound and collect reflected echoes from soft tissues and eventually generate images or measure Doppler signals. an image is acquired on a single animal, imaging only parts of soft tissues of the animal.

- Visualsonics machine (VEVO F2 and VEVO 2100) : These systems are high resolution imaging systems running high frequency probes (15 to 60MHz central frequency), leading to images with resolution up to 40 μ m. Images are acquired using the proprietary software running the system. The system produces anatomical B mode images, Power or Color Doppler images, Non linear contrast images, shear wave elastography images or optoacoustic images. These images can be a single image or 2D+t image sequences. Lastly these images can be acquired in 3D. Additionally, there are Pulsed Wave Doppler traces showing blood flow velocities or Time Motion mode showing 1D data over time. These images are acquired live to frame rates up to 200 images per second, stored in the machine and eventually exported for archiving or measurement using proprietary software (VEVO Lab, Visualsonics).
- Aixplorer (Supersonic Imagine) : This system is a clinical device, tuning probes between 3 to 15MHz Probes, leading to resolution up to 250 μ m. images are acquired using the proprietary software running the system. The system produces anatomical B mode images, Power or Color Doppler images, Shear Wave Elastography images. These images can be a single image or 2D+t image sequences.. Additionally, there are Pulsed Wave Doppler traces showing blood flow velocities. These images are acquired live to frame rates up to 70 images per second, stored in the machine and eventually exported for archiving. Measurement are being done using the proprietary software on the machine.
- Verasonics Vantage 256 : This machine is a high frame rate programmable ultrasound system. It is run using proprietary libraries running using Matlab Software. It can acquire images up to 10000 images per second, and can run ultrasound probes up to 30MHz. The images are stored in a Matlab Format and are processed with user developed software in matlab to generate images. The Raw data or IQ data can be stored for further analysis.

Bioluminescence imaging

The data is collected with an Optima RT (BiospaceLabs, France) system. This system acquires photons coming out of up to 5 mice in a single data acquisition. The system collects photons on a CCD Camera after photoamplification allowing real time photon acquisition. The data is stored in a proprietary format based on list file format (similar to nucea medicine file format, listing the coordinates of each single photon count by the machine). Data is presented as images integrating photon count over time. This photon count can be recalculated after acquisition, changing the integration window. The result image can be displayed in counts of photon, counts per minute, photons, photons per second, photons per second per steradian, photons per second per steradians per cm².

this data, save in a proprietary file format is archived and can further analyzed using the M3 Vision proprietary software.

the machine produces three types of images : a photographs of the animals being imaged, fluorescence images and bioluminescence images.

Fluorescence images are generated after appropriate selection of excitation and emission filters with integration times about a few milliseconds.

Bioluminescence images are acquired without excitation, collected photons emitted by bioluminescence of chemiluminescence reaction in vivo (luciferase-luciferin, luminol,...).

Data Nature	Experimental data
Equipments, technical platforms used	<ul style="list-style-type: none"> • PIV : https://cat.opidor.fr/index.php/PIV

Documentation and data quality

Measurements and associated calculations

What metadata and documentation (for example way of organising data) will accompany the data?

Description Original datasets generated by image analysis software are stored. Datasets always include, name of the animal, date of acquisition. Each parameter is reported as column title together with the unit used.

What methods will be used to ensure their scientific quality?

Description

- 1- outlier detection on repeated mesures
- 2- coherence of the number of expected mesures compared to actual mesures.

Images

What metadata and documentation (for example way of organising data) will accompany the data?

Description

- Name of the image
- Identification of the animal
- Acquisition date
- Acquisition parameters

Metadata/data standards

- REMBI (Recommended Metadata for Biological Images) : <https://rdamsc.bath.ac.uk/api2/m112>

What methods will be used to ensure their scientific quality?

Description

There is no calibration controlled method for ultrasound images right now : not applicable.

Bioluminescence: Image of background signal, allowing to measure the noise level and check reference diode for luminescence.

Legal and ethical requirements, codes of conduct

Measurements and associated calculations

How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?

Description

Pre clinical images can only be acquired if the animal experimentation project as been recorded and approved by the french ministry of research.

What ethical issues and codes of conduct are there, and how will they be taken into account?

Description

- animal experimentation is strongly regulated by european and french laws. Each project has been evaluated by local ethics comitee

Images

How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?

Description

Pre clinical images can only be acquired if the animal experimentation project as been recorded and approved by the french ministry of research.

What ethical issues and codes of conduct are there, and how will they be taken into account?

Description

Animal experimentation is strongly regulated by european and french laws. Each project has been evaluated by local ethics comitee.

Data processing and analysis

Measurements and associated calculations

How and with what resources will the data be processed / analyzed?

Description Raw data are summarized in tablesheet files and further processed for statistical analyses.

Equipments, technical platforms

- PIV : <https://cat.opidor.fr/index.php/PIV>

Images

How and with what resources will the data be processed / analyzed?

Description Images will be processed by proprietary image analysis software provided by the acquisition device manufacturer. These software allow the generation of measurements. The manufacturer's documentation explains how data has to be processed and how calculations are performed.

Equipments, technical platforms

- PIV : <https://cat.opidor.fr/index.php/PIV>

Storage and backup during the research process

Measurements and associated calculations

How will data be stored and backed up during the research?

Storage needs Measurements and associated analyses are stored for 5 years on the facility's server. Open CID is a solution that should be adopted soon.

Estimated volume of data 500

Unit MB

Equipments, technical platforms

- CID : <https://cat.opidor.fr/index.php/CID>

Measures taken for data security

Images

How will data be stored and backed up during the research?

Storage needs Images and image sequences are stored for 5 years on the facility's server. Open CID is a solution that should be adopted soon.

Unit GB

Equipments, technical platforms

- CID : <https://cat.opidor.fr/index.php/CID>

Measures taken for data security

Data sharing and long-term preservation

Measurements and associated calculations

How will data be shared?

Modalities of sharing Most of data are sent by emails or through institutional file sharing services. CID is also an available solution.

Reusability Yes, if contribution is acknowledged.

Data repository/catalogs

- CID : <https://cat.opidor.fr/index.php/CID> ()

How will data be long-term preserved? Which data?

Justification Measurements and associated analyses are stored for 5 years on the facility's server. Open CID is the storage solution that will be implemented soon.

Unit MB

Start date

End date

Final dispositions

Images

How will data be shared?

Modalities of sharing	Using CID or file sharing service.
Reusability	YES, under CC BY SA licence.
Data repository/catalogs	<ul style="list-style-type: none">• CID : https://cat.opidor.fr/index.php/CID ()

How will data be long-term preserved? Which data?

Justification	Images are stored for 5 years on the facility's server. Open CID is the storage solution that will be implemented soon.
Unit	MB
Start date	
End date	
Final dispositions	