Central Research Laboratory

2025 Guidance for New Users
Research Equipment Section
Central Research Laboratory

Central Research Laboratory
Shiga University of Medical Science

2025 Guidance for New Users
Research Equipment Section, Central Research Laboratory (CRL)

How to Register

After taking the guidance, fill out the "Application form for CRL User Registration" referring to the "Example of Entry". Submission of the form will complete your registration.

Once the registration has been processed;
Registered users can continue their registration by simply going through the renewal procedure (submitting the renewal application form) from the following year.

Central Research Laboratory, SUMS
Tel: 077-548-2300
E-mail: hqcrl@belle.shiga-med.ac.jp
URL: http://wwwcrl.shiga-med.ac.jp/index.html

令和7年4月16日
April 16, 2025
14:00

実験実習支援センター・機器部門
2025年度 新規利用者講習会

Guidance for New Users FY2025
Research Equipment Section
Central Research Laboratory

1）機器部門の利用法の概要

1) Overview: Usage of Research Equipment Section

朝比奈　欣治
Kinji Asahina, PhD

実験実習支援センター　准教授
Associate Professor, Central Research Laboratory

支援センター機器部門の利用申請の手順
Registration of new user

説明会　対面で出席
1. 説明会に出席
2. 利用登録書をダウンロードしe-mailの添付ファイルで提出し完了 (hqcrl@belle.shiga-med.ac.jp)

オンラインで視聴の方
1. 説明会中にZoomチャットボックスにリンク先を提示します
2. リンク先からアンケートと利用登録書をダウンロードして記入
3. 書類ファイルをe-mailの添付ファイルで提出し手続き完了
（注）承認後は毎年更新できる（利用講習会は新規のときのみ受講）

For on site attendee
1. Attend this lecture
2. Download “Application Form” and submit it by e-mail attachment
(hqcrl@belle.shiga-med.ac.jp)

For Zoom on line attendee
1. Attend this lecture via Zoom
2. We will provide a unique link in the Zoom chat during the lecture
3. Go to the link and download both “Survey form” and “Application Form”
4. Fill out both forms and send them by e-mail attachment for approval

* All users need to submit a renew application every year

なぜ利用登録が必要なのか？
Why is the registration required?

1. 大学の法人化
・労働安全衛生法を遵守する必要
・安全教育の義務づけ

2.研究関連法令の強化ー罰則化
・遺伝子組換え実験
・病原微生物実験
・動物実験

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1. University level
・All members need to comply the Industrial Safety and Health Act
・All members need to take the education program regarding safety management

2. Strict regulations in research
・Recombinant DNA experiments
・Experiments handling pathogenic microorganisms
・Experimental animals

支援センター機器部門の利用ルール
Rules

1. 機器においてある予約表ノートに「時間」「利用者名」「所属名」「内線番号」を記入。
2. 無駄に長時間に予約しない。予約後30分経過しても使用されない場合は予約無効。
3. 消耗品等の機器以外に必要なものは利用者で用意。
4. 定められた操作法に従って機器を利用する。
5. 使用後、機器においてある利用ノートに記入する（利用負担金の計算に重要）。
6. 使う前のきれいな状態にする。

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1. Make your reservation on the notebook placed near the equipment; Write your name, affiliation, and telephone number on your desired date/time slot.
2. Do not make reservation long time. The reservation will be canceled if no one use it 30 minutes after the start time.
3. Need to bring consumables necessary for using the equipment.
4. Follow the designated rule for each equipment.
5. Fill out the notebook after use (This is important for calculating the user charge).
6. Clean up the equipment.

定められた操作方法に従って機器を利用する！
Follow the designated rule for each equipment

・初めて使う時は、各人が必ず、機器の担当の支援センター職員に操作法・注意点を聞くこと。

・機器操作のマニュアルは、支援センターホームページの「支援センター機器部門ガイドブック –機器別–」（下記URL参照）にあるので適宜印刷して利用してください。
http://wwwcrl.shiga-med.ac.jp/home/kiki_bumon/g_book/contents.html

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・When you use the equipment first time, you must ask the CRL staffs and learn how to use it.

・User manuals are available on the CRL website
http://wwwcrl.shiga-med.ac.jp/home/kiki_bumon/g_book/contents.html

その他
Miscellaneous

1. 24時間利用可能です。
   鍵が必要な部屋の利用は、支援センター職員にお聞きください。
2. 飲食、喫煙の禁止。
3. 「遺伝子工学実験室」、「病原ウイルス実験室」、「動物用X線透視室」の利用には、追加手続きが必要です。
4. 支援センター職員に試料の作成や測定を依頼するサービスもあります。

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1. The CRL facility is open 24 hours.
   Aks the CRL sfaff if you need to use locked rooms.
2. No eating, drinking, and smoking allowed.
3. Additional registration is necessary for access to 'Genetic Engineering room', 'P2 Pathogenic Virus room', and 'Animal X-ray room'.
4. CRL provides "Special service" for several instruments and analyzers.

支援センターのセミナー
Seminars organized by CRL

・支援センターセミナー（随時）
・テクニカルセミナー（随時）
・「医学総合特論」 特別講習会（2025年9月9-12日　実施）

これらのセミナーは大学院講義（実習・演習系）の単位に認定されている
詳細は右記URLを参照（http://wwwcrl.shiga-med.ac.jp/home/seminar/seminar.html）

・Central Research Laboratory Seminar (TBA)
・Technical Seminar (TBA)
・Intensive Course Seminar (Sep 9-12, 2025)
in "Basic Science Fundamentals & Multidisciplinary Seminars"

Participants in the above seminars can obtain credits for the PhD course lectures.
Details are indicated at the CRL website.
(http://wwwcrl.shiga-med.ac.jp/home/seminar/seminar.html)

新規利用者登録方法
How to register

✓ 対面で出席の方
講習会後、「利用登録書」をダウンロードし提出することで登録が完了します。

✓ オンラインで出席の方
チャットボックスに表示されるリンク先から「アンケート用紙」と「利用登録書」をダウンロードし提出することで登録が完了します。

On site attendee
After this lecture, download the application form and submit it to CRL via e-mail

On line Zoom attendee
We will display a link for download site of two forms to be submitted ("survey form" and "application form for CRL User Registration") in the Zoom chat box during this course. By sending them using email, your registration will be completed.

2. 労働安全衛生

Industrial Safety and Health

森　康博
Yasuhiro MORI

実験実習支援センター技術専門職員
Technical staff, Central Research Laboratory

滋賀医科大学安全衛生管理組織
SUMS Industrial Safety and Health Management System

国立大学法人滋賀医科大学	Shiga University of Medical Science
総括安全衛生管理者	General Safety and Health Manager
安全責任者・衛生責任者	Safety Controller/ Health Controller
安全衛生責任者：講座の長	Safety and Health Controller: Department head

実験実習支援センター内
Central Research Laboratory

センター長　Center Director (Prof. Ito)
作業主任者　Operations Chief
（特定の作業場所）
例：洗浄滅菌室（EOG滅菌器）

勧告指導組織：労働安全衛生委員会　Recommendation & Request System: Industrial Safety and Health Committee
産業医・衛生管理者　Industrial Physician and Health Officer: Inspecting tour in the work site

支援センター内での労働安全衛生上の注意
Industrial Safety and Health at the CRL

- 労働安全衛生法に反した行動をとらないこと
  Follow the Industrial Safety and Health Act.
- 規制された有機溶剤・特定化学物質の使用は極力避ける、もしくは見直す
  Avoid the use of regulated-organic solvents and specified chemical substances.
- 自らの使用だけではなく、他の利用者に配慮する
  Ensure safety at the working space.
- 自らの安全は自らで守る
  Ensure your own safety.
- 危険なところには立ち入らない（エックス線透視室等）
  Do not enter restricted areas (e.g. X-ray Fluoroscopy Lab).

SDS（Safety Data Sheet）
化学物質や化学物質が含まれる原材料などを安全に取り扱うために必要な情報を記載したもの

SDS provide procedures for handling or working with that substance in a safe manner.

有害物質に対する作業環境管理の手法
How to manage and handle harmful substances

1. 有害物質の使用の中止、有害性の少ない物質への転換
   Try to use less harmful substances.
2. 有害作業の改良によって有害物質発散の防止
   Prevent spreading harmful substances by improving your procedure.
3. 有害物質を取り扱う設備の密閉化や自動化
   Avoid leak of harmful substances from your space and introduce automated system for handling
4. 有害な行程の隔離と遠隔操作の採用
   Work as far as possible from harmful substances and use remote handling equipment.
5. 局所排気装置の設置(ドラフトチャンバー)
   Set up a local exhaust ventilation system (e.g. draft chamber).
6. 全体排気装置の設置
   Set up a complete exhaust ventilation system.

番号順に改善していくことが重要
Improve listed as above

薬品管理システム CRIS FOREST の導入について
CRIS FOREST (Chemical Registration Information System)

まるっと滋賀医大
(Sharing system)

研究
(Research)

薬品管理システム
(CRIS FOREST)

- 試薬とガスボンベ類はすべてCRIS FORESTに登録すること
  Need to register all chemicals and gas cylinders to CRIS FOREST
- 試薬やガスボンベの使用を記録すること
  Update CRIS FOREST when chemicals and gas are used

薬品管理システムの問い合わせ先: 施設課安全衛生管理係(内線2426)
Ask Facilities Division (Ext. 2426) regarding CRIS FOREST

ホルムアルデヒドの取扱いについて
Handling Formaldehyde

- 発散源を密閉にすること
  Avoid leak of formaldehyde from the bottle
- 関係者以外の立ち入り禁止
  Do not allow others to enter the formaldehyde space
- 作業の記録の保存(30年間)
  Keep formaldehyde use records 30 years
- 休憩室、洗浄設備の設置
  Prepare a space for resting and washing
- 取り扱い上の注意事項等の掲示
  Display of formaldehyde handling precautions

Formaldehyde should be used under the fume hood in the CRL.
Users should sign in a Formaldehyde Log after use.

液体窒素の取扱いについて
Liquid Nitrogen

- 専用手袋を着用する(軍手は使用しない)
  Wear special gloves. (Never use cotton work gloves.)
- 汲み出し中にその場を離れない
  Do not leave the working area while pouring.
- 酸欠防止のために汲み出し中に廊下側の扉は常時開けておく
  Keep the room open when you use liquid nitrogen to prevent oxygen deficiency.
- 運搬時にも専用手袋を着用する
  Wear special gloves during transportation.
- エレベーターを使用するときは容器のみを乗せ、同乗しない
  When transporting a liquid nitrogen container in an elevator, do not ride in the elevator with the container.

大学内での労働災害の事例
Example of industrial accidents in SUMS

- フェノールによる化学火傷
  Chemical burn by phenol
- 抗ガン剤の飛散による眼の障害
  Ocular injury through spreading of anticancer drug cocktail
- 液体窒素による低温火傷
  Cold burn by liquid nitrogen
- 炭酸ガス培養器のガスボンベ落下による打撲
  Bruise from overturning of a carbon dioxide cylinder
- 針刺し事故
  Accidental needle stick

支援センター内での緊急時の措置及び退避(火災発生時)
Emergency Procedures & Evacuation at CRL (in case of FIRE)

1. 助けを求める
   Ask help.
2. 防災監視室(内線2773)もしくはセンター職員に通報・連絡する(内線2300)
   Call Security Control Center (Ext.2773) and the CRL office (Ext.2300) immediately.
3. 可能であれば初期消火、避難誘導、危険物の搬出に努める
   Help extinguish the fire if it is at an early stage, provide evacuation instructions and bring out hazardous materials (e.g. alcohol).

いかなる場合も危険と判断したらすぐに避難してください !!

Evacuate from the fire zone if you think it dangerous.

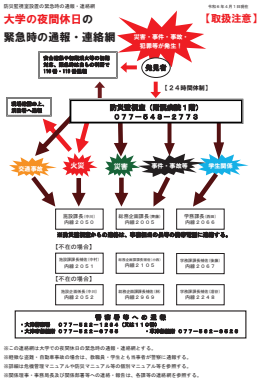
支援センター内での緊急時の措置及び退避（事故発生時）
Emergency Procedures & Evacuation at CRL (in case of ACCIDENT)

1. まず自分の安全を確保し二次災害を防ぐ
   Make sure your safety and prevent the secondary accident.
2. 怪我人がいる場合は適切な処置を行う
   Help injured persons if it is possible.
3. センター職員に連絡する（内線2300）
   Notify the CRL staffs (Ext.2300) immediately.
4. 事故報告書を支援センターに提出
   Submit an accident report to CRL.

緊急時の通報・連絡網について
Emergency Contact Network

緊急時の通報・連絡網は、ホームページからダウンロードできます。
Emergency Contact Network sheet are available for download on the SUMS website.

滋賀医科大学ホームページ
「まるっと滋賀医大」
↓
「管理運営」
↓
「防災・危機管理」
↓
「緊急時の通報・連絡網（大学）」



3.「遺伝子組換え実験室」、「病原ウイルス実験室」の利用と手続き

How to use the "recombinant DNA room" and "pathogenic virus room"

森　康博
Yasuhiro MORI
実験実習支援センター技術専門職員
Technical staff, Central Research Laboratory

遺伝子組換え実験を規制する法律
Regulation of recombinant DNA experiments

「遺伝子組換え生物等の使用等の規制による生物の多様性の確保に関する法律（カルタヘナ法 Cartagena Law）」

Act on the Conservation and Sustainable Use of Biological Diversity through Regulations on the Use of Living Modified Organisms(LMOs), so-called Cartagena Law

拡散防止措置（二種省令）
環境中への拡散を防止して行う使用等（大学等の実験室内）

Containment measures (Type 2 Use of LMOs)
Possible uses are those with containment measures to prevent to dispersal of LMOs in the environment (Uses in laboratories etc).

拡散防止措置の違反事例
An example of violation

報　道　資　料

奈良県立医科大学

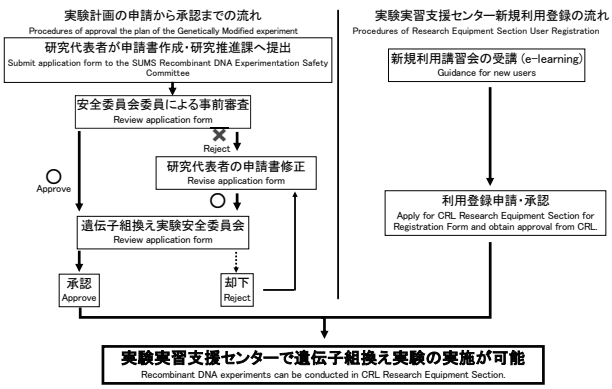
大腸菌等の不活化処理を怠ったなどの拡散防止措置を講じなかった
Disposed E. coli solution without autoclaving.
Serious violation of Cartagena Law.

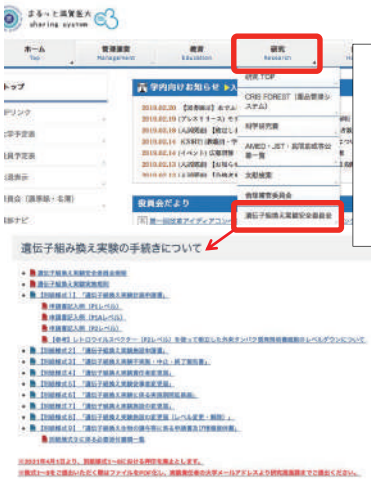
⇩

文科省からの厳重注意・学内調査・実験停止
悪質な場合は最高一年以下の懲役又は百万円以下の罰金
The government may order suspension of research.
Offender shall be punished by imprisonment or a fine, or a combination of these two.

に、平成25年4月から同28年3月までの3年間、平均して月に1-2回の頻度で、所属する研究部署の実験室内の実験用シンクに廃棄していた。
このことは、本学職員就業規則【注2】違反であるため、本学職員懲戒規程に則

遺伝子組換え実験室の利用手続き
Application of your recombinant DNA experiment





各種申請書ダウンロード

「まるっと滋賀医大」

「研究」

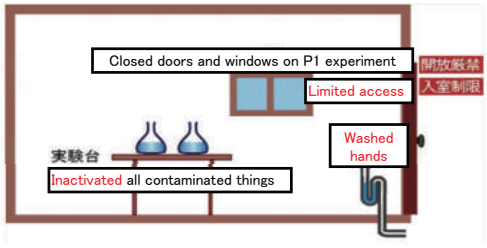
「遺伝子組換え実験安全委員会」

「遺伝子組換え実験の手続きについて」

窓口：研究推進課研究支援係
：2110
E-mail: hqshien@belle.shiga-med.ac.jp

P1レベル拡散防止措置（抜粋）

Containment Measures of P1 Level Laboratory



P1Aレベル拡散防止措置（抜粋）

Containment Measures of P1A(experiment with Animal) Level Laboratory

遺伝子組換え生物等が逃亡その他拡散しない構造の容器に入れること
When a LMO is taken out of the laboratory in process of an experiment, the LMO shall be put in a container of the structure that prevents it from leaking or other dispersion.

遺伝子組換え生物等の種類ごとに識別することができる措置を講ずること
Take a measure that is capable of identifying modified animals.

遺伝子組換え実験室で特に注意が必要な項目

Keep the recombinant DNA room clean

初めて使用する場合、必ずセンター職員に聞く

When using the equipment for the first time, please ask the CRL staffs how to use it.

分からない点はセンター職員に聞く

Do not hesitate to ask any questions to CRL staff.

オートクレーブ滅菌が終了したら持ち帰る

Do not leave the waste after autoclaving.

ウイルス実験室
Pathogenic Virus Lab

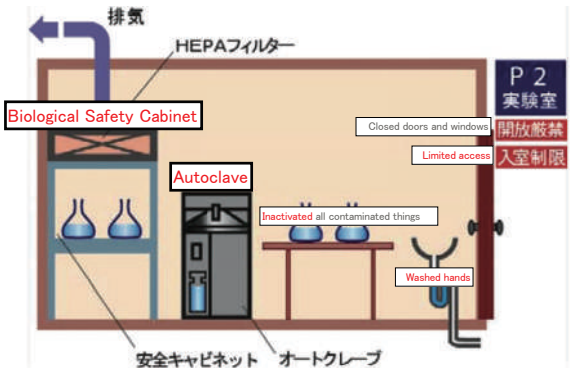
- 大学の病原体等安全管理規程に定められているレベル1・2の病原体等取扱が可能です。
  Pathogenic Virus Lab can be used for microorganisms with biosafety level 1 and 2 stipulated in the SUMS Biosafety Management Rules.
- 遺伝子組換え実験の申請者は、P1・P2レベルの実験も可能です。
  This lab can be used for P1 and P2 level recombinant DNA experiment use.
- 利用には登録が必要です。
  Registration is required for use.

ウイルス実験室2
Pathogenic Virus Lab 2
（for Adenovirus）

ウイルス実験室3
Pathogenic Virus Lab 3
（for Retrovirus, Lentivirus）

P2レベル拡散防止措置（抜粋）

Containment Measures of P2 Level Laboratory



病原ウイルス実験室の利用申請の流れ
Application Process for Use of CRL Pathogenic Virus room

支援センター機器部門利用登録
User Registration in Research Equipment Section, CRL
http://gakucrl.shiga-med.ac.jp/gakunai/gakunai/0_riyousinsei/kiki_bumon/sinki.html

↓

滋賀医科大学バイオセーフティ委員会への届出
Application to the SUMS Biosafety Committee
http://gakucrl.shiga-med.ac.jp/gakunai/gakunai/0_riyousinsei/kiki_bumon/virus2.html

↓

実験実習支援センター病原体等取扱申込書の提出
Submission of the "CRL Application Form for Handling Pathogens, etc."
http://gakucrl.shiga-med.ac.jp/gakunai/gakunai/6_Regulations/kiki_regulations/kiki_regulations_virus_0704.html

↓

支援センター管理責任者の承認
Approval by the CRL Director

↓

病原ウイルス実験室の利用
Acceptance for Use of Pathogenic Virus Lab

実験実習支援センター機器部門の共同利用の遺伝子組換え実験室

the recombinant DNA laboratory in CRL Research Equipment Section

1階 1st floor	エックス線照射室 X-ray Irradiation Lab	P1A	Yamamoto(2304) Mori(2307)
	3T MRI実験室 3-Tesla MRI lab	P1A	Terado(2306)
2階 2nd floor	遠心機室 Centrifuge Lab	P1	Mori(2307) Terado(2306) Yamamoto(2304)
3階 3rd floor	遺伝子工学実験室 Genetic Engineering lab	P2	Terado(2306)
	小動物イメージング解析室 Small Animal Imaging Analysis Lab	P1A	Yamamoto(2304) Mori(2307) Terado(2306)
4階 4th floor	細胞工学実験室1 Cell Engineering lab 1	P1	Mori(2307) Yamamoto(2304)
	細胞工学実験室2 Cell Engineering lab 2	P1	Mori(2307) Yamamoto(2304)
	細胞工学実験室3 Cell Engineering lab 3	P1A	Yamamoto(2304) Mori(2307)
	細胞工学実験室4 Cell Engineering lab 4	P2	Mori(2307) Yamamoto(2304)
	細胞培養室 Cell culture lab	P1	Mori(2307) Yamamoto(2304)
	病原ウイルス実験室1,2,3 Pathogenic Virus Lab 1,2,3	P2	Mori(2307) Yamamoto(2304)
	レーザー顕微鏡室1 Confocal Laser Scanning Microscope Lab 1	P1A	Yamamoto(2304) Mori(2307)

4）動物実験の手続き

4) How to start animal experiments at CRL

実験実習支援センター
寺戸　勅雄

Central Research Laboratory
Tokio Terado

動物実験を行うための手続き

Application of animal experiment

動物生命科学研究センター　登録申請
RCALS (Research Center for Animal Life Science)

1、動物実験に関する教育訓練の受講
2、動物実験資格認定試験の合格
3、行おうとする動物実験の認定を有する

Need to complete following:
1. Completed the training program in animal experiment.
2. Pass the qualification exam of animal experiment.
3. Obtain the certification on animal experiment.

↓

動物生命科学研究センター登録申請
Apply for the registration to Research Center for Animal Life Science.

↓

動物センターへ動物実験計画書の提出
動物実験委員会による計画書の審査
Obtain approval for the Plan

修正 Revise　　承認 Approve

別途手続が必要

遺伝子組換え実験
Recombinant DNA experiment

エックス線実験
X-ray experiment

支援センター機器部門利用登録
Obtain approval for registration to CRL Research Equipment Section

動物実験を行うための手続き

Application of animal experiment

動物生命科学研究センター　登録申請
RCALS (Research Center for Animal Life Science)

1、動物実験に関する教育訓練の受講
2、動物実験資格認定試験の合格
3、行おうとする動物実験の認定を有する

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支援センター機器部門利用登録
Obtain approval for registration to CRL Research Equipment Section

動物実験室の利用に関して

Animal experiments in the CRL rooms

「動物の愛護及び管理に関する法律」、「滋賀医科大学動物実験規程」に従う。

Perform animal experiments under the Law Concerning the Protection and Control of Animals and the regulations of Research Center for Animal Life Science in SUMS.

動物実験とエックス線や遺伝子組換え実験を含む場合は、それら関連規則に従う。

Comply the related law and regulations when performing animal experiments with X-ray and/or recombinant DNA.

CRLで承認されている動物実験室
Approved rooms for animal experiments at CRL

１０３号室	MR(３T)研究室 3-Tesla MRI lab	マウス、ラット、イヌ、ウサギ、カニクイザル、ブタ Mouse, Rat, Dog, Rabbit, Crab-eating macaque, Pig
１０６号室	動物用エックス線透視室 Animal X-ray Fluoroscopy Lab	ラット、イヌ、ウサギ、カニクイザル、ブタ Rat, Dog, Rabbit, Crab-eating macaque, Pig
１１６号室	エックス線照射室 X-ray Irradiation Lab	マウス、ラット、カニクイザル Mouse, Rat, Crab-eating macaque
３０４号室	小動物イメージング解析室 Small Animal Imaging Analysis Lab	マウス、ラット、モルモット、ウサギ Mouse, Rat, Guinea pig, Rabbit
４０３号室	細胞工学実験室３ Cell Engineering lab 3	マウス、ラット Mouse, Rat
４１２号室	レーザー顕微鏡室１ Confocal Laser Scanning Microscope Lab 1	マウス・ラット・カニクイザル（実験で使用するのは全て胚） Mouse, Rat, Crab-eating macaque (Can use only embryo)
スキルズラボ棟１階	ウェットラボ Wetlab	マウス、ラット、イヌ、ウサギ、カニクイザル、ブタ Mouse, Rat, Dog, Rabbit, Crab-eating macaque, Pig

5）受託サービス

5) Research support by CRL

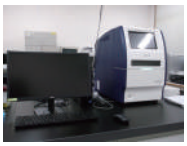
実験実習支援センター
寺戸　勅雄

Central Research Laboratory
Tokio Terado

受託サービス
Research support by CRL

DNA Sequencing

1. 泳動のみ
   ユーザーがシーケンシング反応まで行いサンプルを提出
2. シーケンシング反応+泳動
   プラスミドを提出する



DS3000（Hitachi）

You have 2 choices
1) prepare sequencing reaction and submit the sample for running
2) submit a plasmid for DNA sequencing.

1. 依頼書をWebサイトからダウンロードして記入
   Download and fill in the Excel order form
2. 依頼書とサンプルを分析準備室（307号室）へ提出
   Submit samples with the order form to Room 307
3. 担当職員によるシーケンシングと結果の受け渡し
   CRL's staff will run your samples and return the data

Terado (Ext. 2306)
3F Room307

受託サービス
Research support by CRL

自動細胞分取解析装置（FACS）、サイトメーター
Fluorescence activated cell sorter (FACS), Cytometer

FACSAria Fusion（Becton, Dickinson）

Mori (Ext. 2307)
4F Room405

受託サービス
Research support by CRL

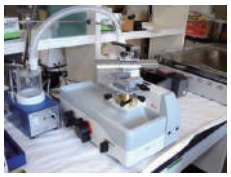
エチレンオキサイドガス滅菌器
Ethylene Oxide Gas Sterilizer

Yamamoto (Ext. 2304), Mori (Ext. 2307)
4F Room421

受託サービス
Research support by CRL

パラフィンブロック、切片作成
Preparations of paraffin blocks and sections

自動包埋装置
Automate tissue Processor



ミクロトーム
Microtome

Yamamoto (Ext. 2304)
4F Room401

その他サービス
Additional support provided by CRL

Bioinformatics解析（門田先生）
Bioinformatics analysis by Dr. Kadota

10x Genomics Single cell RNA-sequencing reagentの代理購入
Provide 10x Genomics Single cell RNA-sequencing reagent

qPCR plateの販売
Provide qPCR plates

MOLSIS Molecular Simulation & Informatics Systems Software

FlowJo software for Flow cytometer and FACS analysis

Leica LAS-X software for image processing

Photoshop

実験技術指導
Hands-on guidance on your experiments

実施例

1. 臨床の研究者より、DNA突然変異を同定するための、PCRプライマーの作成方法、PCRの方法、シーケンシングの方法の相談があり、無事に標的遺伝子のシーケンシングを行った。

A young researcher in the SUMS hospital wanted to determine gene mutations in the patient sample. The CRL staff helped designing primers, PCR, and DNA sequencing. The mutation was successfully detected.

2. ウエスタンブロッテングの方法をプロトコールとともに説明。今後、サンプル調整から電気泳動、ウエスタンブロッテングを一緒に行い技術習得を進める。
We are teaching how to do Western blotting.

Please ask us if you would like to know how to perform experiments. We may not help your issues directly, but will help your research as much as we can.

6. X線発生装置の登録手続き
How to use X-ray generators at CRL

山元　武文
Takefumi Yamamoto

実験実習支援センター技術職員
Technical staff, Central Research Laboratory

X線発生装置の利用法規について
Ordinance and regulations of X-ray generators

電離放射線障害防止規則
Ordinance on Prevention of Ionizing Radiation Hazards

基本原則：労働者の電離放射線被ばくをできるだけ少なくする
Basic Principle: Minimize the exposure of workers to ionizing radiation, as low as possible

滋賀医科大学医学部放射性同位元素等の規制に関する規程
SUMS Regulations on the Regulation of Radioisotopes, etc.

滋賀医科大学実験実習支援センター機器部門利用内規
CRL Operating Bylaws

エックス線発生装置の利用方法（申し合わせ事項）
CRL Rules on X-ray Generator Utilization

実験に利用できるX線発生装置
X-ray generators for research

X線照射装置 RS320（AcroBio）
動物生命科学研究センター1階

X-ray Irradiator
(1st floor, Research Center for Animal Life Science)

X線回折装置 PW-1830（Philips）
実験実習支援センター1階

X-ray Diffractometer
(1st floor, Central Research Laboratory)

No risk of x-ray leaking from these generators

X線発生装置の利用登録手順
Registration of use of X-ray generators

実験実習支援センターの利用者登録　CRL User Registration

1. 機器担当者による一時間の教育訓練
Take an education and training class (1 hour) provided by CRL

2. エックス線発生装置の利用者登録（研究推進課）
Registration

●X線照射装置使用の登録完了
Registration is completed for users of X-ray irradiators
(No need blood test and wearing a film badge)

ポケット線量計の使用
Users need to wear a pocket dosimeter

利用ノートに記入
X-ray user must record the radiation dose to the logbook.

動物用X線透視装置
X-ray fluoroscope for animals

透視・撮影を装置横で行うため、被ばく防護用のプロテクター（防護衣、ネックガード、防護用メガネ）を着用すること

Users should use appropriate protective wears to prevend inevitable exposure of X-ray.

Cアーム付き動物用エックス線透視装置 (ARCADIS Avantic Gen2, SIEMENS)
実験実習支援センター1階

Laboratory Animal X-ray Fluoroscope in Central Research Laboratory

Users will be exposed to X-ray!

動物用X線透視装置の利用登録手順
Registration of use of X-ray fluoroscope for animals

実験実習支援センターの利用者登録　CRL User Registration

1. 機器担当者による4.5時間の教育訓練
   Take education and training session (4.5 hours) provided by CRL
2. エックス線発生装置の利用者登録（研究推進課）
   Registration

●血液検査
To use X-ray fluoroscope, users need to take blood tests

フィルムバッジの使用
Users need to wear a film badge

ポケット線量計の使用
Users need to wear a pocket dosimeter

利用ノートに記入
X-ray user must record the radiation dose to the logbook.

学内登録申請（まとめ）
Registration as a radiation worker in SUMS

装置名 X-ray generator	名称 Worker	教育訓練 Education and training	放射線業務従事者登録 Registration as radiation worker	個人被ばく線量計 Personal dosimeter	血液検査 Blood test	健康診断 Health check
エックス線照射装置 X-ray Irradiator	エックス線作業者 X-ray worker	1 時間以上 1 hr. or more	要 Need	ポケット線量計 Pocket dosimeter	不要 No need	要 Need
動物用エックス線透視装置 Animal X-ray Fluoroscope	透過写真撮影業務従事者 Transmission photography operator	4 時間半以上 4.5 hrs. or more	要 Need	ルミネスバッジ Luminess badge	要 Need	要 Need

担当：山元（内線2304）
Technical staff: T. Yamamoto (Ext. 2304),

7. 機器紹介

Introduction of each equipment available at CRL

岡本　久美
Kumi Okamoto

実験実習支援センター 技術職員
Technical staff, Central Research Laboratory

3T MRI (CRL 1st floor)

MAGNETOM Verio (Siemens)

For large animals

4.7T MRI (RCALS 1st floor)

BioSpec 47/40 USR (Bruker)

For small animals

NMR (CRL 1st floor)

JNM-ECX400
For solid samples
JNM-ECZ400S
For liquid samples

強い磁場内に置かれた試料の分子構造を核磁気共鳴により推定する装置

NMR can determine the molecular structure of a sample placed in a strong magnetic field by nuclear magnetic resonance.

CRL 2nd floor

MALDI-TOF-MS AXIMA (Shimadzu)

小分子の分子量を測定する装置

The device is capable of measuring molecular weight of small molecules.

Gas chromatograph mass spectrometer GCMS-QP2010 SE (Shimadzu)

有機化合物などの分子量を測定する装置

This device can measure molecular weight of gas molecules.

CRL 2nd floor

New **HPLC Nexera (Shimadzu)**

液体試料に溶解した成分を分離し、定性、定量分析する装置

HPLC can separate and quantify components dissolved in a liquid sample.

HPLC AKTA (GE)

ペプチド、タンパク質の定量や精製

Peptides and proteins can be quantified and purified.

CRL 2nd floor

Multiplate reader M Plex (Tecan)

吸光, 蛍光, 発光を測定する装置

Compatible to 6-384 well Plates for measuring absorption, fluorescence, and luminescence.

Microvolume Spectrophotometers

少量サンプルで 核酸, タンパク質を定量

Nucleic acid, protein, etc. can be quantified with a small sample of 1 - 2 µL.

CRL 2nd floor

Bioanalyzer2100 (Agilent)

マイクロチップを用いてDNA, RNA, タンパク質の電気泳動解析を行う装置

Quantify nucleic acids or proteins using a microchip

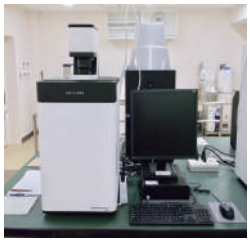
LightCycler 480 (Roche)

遺伝子の発現をreal-time PCRにより定量的に解析する装置
96well, 384wellプレートをセンターで販売しています

For quantitative PCR analysis of gene expression. Users may purchase PCR plates from CRL.

CRL 2nd floor

Chemiluminescence imaging system FUSION



ウエスタンブロットのケミルミ検出

Chemiluminescence detection for Western blotting.

Gel Imaging Device FAS5

EtBrなどで染色されたゲル内のDNAをLEDライトによって検出する装置

Detection of nucleic acid stained with EtBr by LED

CRL 2nd floor

Centrifuge

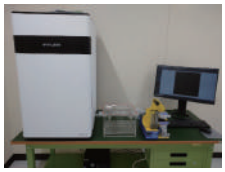
Ultracentrifuge

各種ローターを揃えています
Various rotors are available.

Ask the CRL staff which rotor will be compatible.

CRL 3rd floor (To be relocated to RCALS)

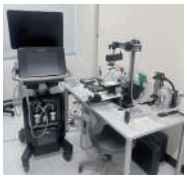
In vivo imaging system NEWTON 7.0



Detection of bioluminescence and fluorescence in live animals

New

High-resolution Ultrasonic Echo Imaging System



Visualize *in vivo* anatomical, functional, and physiological data in real time using ultrasound echo.

CRL 3rd floor

Redox Analyzer REDOXLIBRA

Measurement ROS and free radicals

Chemistry Analyzer VetScan

Measurement blood chemistry

Blood Analyzer Celltac α

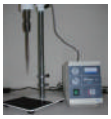
Measurement of blood cell parameters

New **Tetrapolar Bioimpedance Spectroscopy Device ImpediVET**
(To be relocated to RCALS)

Measurement of fluid status and tissue composition in live animals

CRL 3rd floor

Ultrasonic cell crusher



Homogenization with beads Minilys

Polytron homogenizer

Vacuum freeze dryer

CRL 4th floor

Confocal Laser Scanning Microscope

1. **Leica TCS SP8 X**
2. **Leica Stellalis 8** New
3. **Nikon AX** New
4. **DragonFly201**

層の深さを選択して高解像度の光学画像を取得できます。
どの共焦点レーザー顕微鏡が適しているか、スタッフにお尋ねください

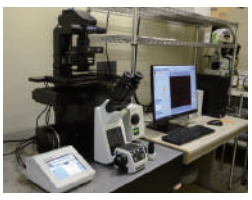
Confocal laser scanning microscopy is a technique for obtaining high-resolution optical images with depth selectivity.

Please ask CRL staff which microscope will be suitable for your experiment.

CRL 4th floor

Other microscopes

1. **Inverted Fluorescence Microscope IX83 (Olympus)**
2. **DeltaVision High-resolution Fluorescence Microscope（GE）**
3. **All-in-one fluorescence microscope BZ9000 (Keyence)**
4. **Eclipse Ni-E (Nikon)**



どの顕微鏡が適しているかスタッフにお尋ねください

Ask us which microscope will be suitable for your experiment.

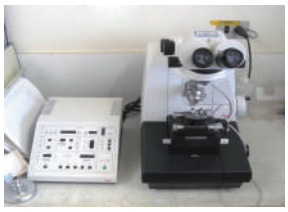
CRL 4th floor

New

Transmission Electron Microscope HT7800（Hitachi）

Scanning Electron Microscope JSM-7505FA（JEOL）
JSM-6010LA（JEOL）

CRL 4th floor



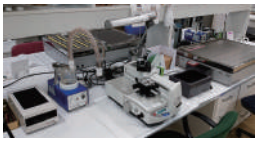
Ultramicrotome ULTRACUT E (Reichert-Jung)
Making thin sections for electron microscope

Draft Chamber
Use organic solvent under the draft chamber

CRL 4th floor

Automated Tissue Processor
Parrafin embedding

Tissue Embedding Console
Making paraffin blocks

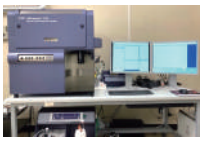


Microtome
Making paraffin sections

Cryostat
Making frozen sections

CRL 4th floor

Flow Cytometer
1. LSRFortessa X-20 (BD)
2. FACSCanto II (BD)
3. CytoFLEX S (Beckman) New
4. FACS Calibur (BD)
5. Attune (AB)



Cell analysis

FACS
1. FACS Aria Fusion (BD)
2. FACS Aria Fusion (BD)

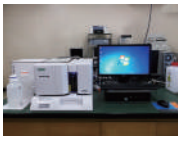
Cell analysis and sorting

Ask us which equipment will be suitable for your experiment.

CRL 4th floor

autoMACS Separato (Miltenyi Biotec)
Cell separation using antibodies

Suspension Array System Bio-Plex200 (Bio-Rad)
Measuring cytokines using special beads



Extracellular Flux Analyzer XFe24 (Seahorse Bioscience)
Measuring metabolism in cultured cells

CRL 4th floor

CO_2 Incubator and clean bench

Users may request use of CO_2 incubator or clean bench for cell culture.

CRL 4th floor

Large Capacity Liquid Nitrogen Cryopreservation Equipment (MVE Heco1536P)
Store cells in liquid nitrogen gas

Liquid Nitrogen
Users can buy liquid nitrogen from CRL

Milli-Q and Elix Water System (2nd and 4th floor)
Users can buy pure water from CRL

8）過去の事故例

8) How to avoid unnecessary accidents?

豊田 太
Futoshi Toyoda, PhD

実験実習支援センター 講師
Assistant Professor, Central Research Laboratory

過去に実際に発生した事故
Accident case 1

The rotor came off from the spindle and rolled around in the chamber.
The rotor and spindle were severely damaged.

過去に実際に発生した事
Accident Case 2

The bucket came off from the running rotor at 40,000 rpm and crashed onto the chamber wall at a velocity of over 1,600 km/h.
Relative Centrifugal Field is 193,000 g.

遠心機使用時の注意事項

Tips for safety centrifuge operation

- 遠心機に適合したローターと遠心管の使用
  Use the rotor and tubes that are compatible to the centrifuge.
- ローターを駆動軸に正しくセットする
  Install the rotor to the centrifuge properly.
- 亀裂やひび、傷のある遠心管は絶対に使用しない
  Do not use the tubes having signs of cracks or defects.
- ローターと遠心管の最高許容回転数を厳守する
  Check the maximum allowable speed of the rotors and tubes.
- 試料は必ずバランスを取り、ローター内に対称位置にセットする
  Place tubes symmetrically in the rotor to balance samples.
- ローターが設定回転数に達するまで、遠心機のそばを離れない
  Keep by the side of the centrifuge until the rotor speed reaches the maximum speed.

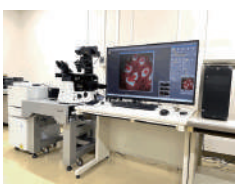
2023年に発生した事故
Accident Case 3

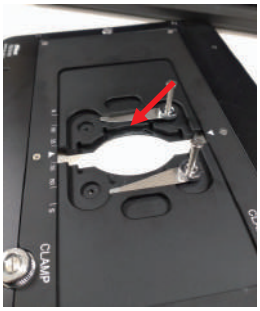
Leica TCS SP8 X
Confocal Laser Scanning Microscope

In 2023, someone broke the objective lens.
It cost 700,000 yen for replacement.

2025年に発生した事故
Accident Case 4

Nikon/AX Confocal Microscope





The user wanted to see the edge of the slide and moved the objective lens upward to adjust focus.
Then, the objective lens hit and bent the stage holder.

注意点
General precautions

1. 事故を起こしたときは、直ちに支援センター職員に報告すること
2. 故障等異変に気がついたときは、直ちに支援センター職員に報告すること
3. 何事においても自分で判断するのではなく、支援センター職員に相談すること
4. 自分の教室で行っているルールよりも支援センターのルールが優先する
5. 誤った利用をしている利用者のマネをしない

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1. If you cause any accident, immediately inform it to the CRL staff.
2. If you notice anything unusual such as a trouble with equipment, immediately inform it to the CRL staff.
3. If you are not sure how to use the equipment, ask the CRL staff about it. DO NOT use the equipment only on your own idea and judgment.
4. In using the CRL facilities, the rules at CRL are prior to those at your lab.
5. DO NOT follow the user who acts in incorrect manner and method.

新規利用者登録方法
How to register

✓ 対面で出席の方

講習会後、「利用登録書」をダウンロードし提出することで登録が完了します。

✓ オンラインで出席の方

チャットボックスに表示されるリンク先から「アンケート用紙」と「利用登録書」をダウンロードし提出することで登録が完了します。

On site attendee

After this lecture, download the application form and submit it to CRL via e-mail

On line Zoom attendee

We will display a link for download site of two forms to be submitted ("survey form" and "application form for CRL User Registration") in the Zoom chat box during this course. By sending them using email, your registration will be completed.

Contact Number & E-mail Address
Research Equipment Section of Central Research Laboratory

○ Director of CRL

Job title	Name	Ext.	E-mail
Professor	Itoh, Yasushi	2171	yasushii@belle.shiga-med.ac.jp

○ Faculty of CRL

Job title	Name	Ext.	E-mail
Associate Professor	ASAHINA, Kinji	2301	asahina@belle.shiga-med.ac.jp
Senior Associate Professor	TOYODA, Futoshi	2322	toyoda@belle.shiga-med.ac.jp

○ Technical Staff

Job title	Name	Ext.	E-mail
Technical Staff	MORI, Yasuhiro	2307	moriyasu@belle.shiga-med.ac.jp
Technical Staff	OKAMOTO, Kumi	2302	okamotok@belle.shiga-med.ac.jp
Technical Staff	FUKUNAGA, Sachiko	2303	sfuku@belle.shiga-med.ac.jp
Technical Staff	TERADO, Tokio	2306	terado@belle.shiga-med.ac.jp
Technical Staff	YAMAMOTO, Takefumi	2304	tyama@belle.shiga-med.ac.jp

○ Administrative Staff

Job title	Name	Ext.	E-mail
Technical Staff	YAMAKAWA, Nobuko	2300	nyama@belle.shiga-med.ac.jp

○ Central Research Laboratory

Location	Ext.	E-mail
2F Central Research Laboratory office	2300	hqcrl@belle.shiga-med.ac.jp

More information on CRL is available at the CRL web site (http://wwwcrl.shiga-med.ac.jp/index.html) where you can get a list of installed equipment, online edition of the operation manuals, etc. and download various request/application forms.

Device List (Research Equipment Section, Central Research Labolatory)

BIOCHEMISTRY	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Nuclear Magnetic Resonance Spectroscopy	JEOL/JNM-ECZ400S, JNM-ECX400	1,000/h (Day Max 5,000)	1F NMR Lab
Microplate Reader	TECAN/Infinite M PLEX	100/use	2F Biochemical Analysis Lab 1
Spectrophotometer	Thermo Fisher/NanoDrop One, NanoDrop ND-1000	—	2F Molecular Biology Analysis Lab
UV-Vis-NIR Spectrophotometer	JASCO/V-570DS	—	2F Biochemical Analysis Lab 1
Fourier Transform Infrared Spectrometer	SHIMADZU/IRPrestige-21	—	2F Protein Engineering Lab
Fluorescence Spectrometer	HITACHI/F-2500	—	2F Protein Engineering Lab
Circular Dichroism Spectrometer	JASCO/J-1500	—	2F Biochemical Analysis Lab 1
Gel Imaging System	NIPPON Genetics/FAS5 UVP/GDS-7900	—	2F Molecular Biology Analysis Lab
Lumino Image Analyzer	FUJIFILM/LAS-4000	100/use	2F Molecular Biology Analysis Lab
Chemiluminescence Imaging System	Vilber-Lourmat/FUSION	100/use	2F Molecular Biology Analysis Lab
Preparative Ultracentrifuge	Beckman/Optima L-90K	100/10min (5,000/More than 500min)	2F Centrifuge Room
Tabletop Ultracentrifuge	Beckman/Optima MAX-TL	100/10min (5,000/More than 500min)	2F Centrifuge Room
High Speed Refrigerated Centrifuge	Beckman/HP-25·HP-26	200/use	2F Centrifuge Room
Hybrid High Speed Refrigerated Centrifuge	KUBOTA/6200	—	2F Centrifuge Room
Low Speed Centrifuge	TOMY/LC-131	—	2F Molecular Biology Analysis Lab
High Speed Refrigerated Centrifuge (P2 Lab)	Beckman/Avanti J-E	200/use	2F Gene Engineering Lab P2
High Speed Refrigerated Microcentrifuge	TOMY/MX-305	—	2F Gene Engineering Lab P2
	HITACHI/CF16RN	—	3F Centrifuge Room
Plate Centrifuge	KUBOTA/PlateSpin Ⅱ	—	2F Molecular Biology Analysis Lab
Multipurpose Centrifuge	Beckman/GS-15R	—	2F Gene Engineering Lab P2
Low Speed Refrigerated Centrifuge	Himac/CF7D2	—	2F MS Spectrometry Lab
Vaccume Concentrator/Speedvac Concentrator	Thermo Fisher/SPD1010	200/use	2F Centrifuge Room
Shaking Incubator	Sanki Seiki/SCS-R·SCS-12R, TAITEC/BR-30L,BR-30LF,BR-43FL	—	2F Gene Engineering Lab P2
Lyophilizer	LABCONCO/LL-1	200/d	3F Cell Homogenization Room
Ultrasonic Homogenizer	BRANSON/Sonifier Model 450-Advanced	—	3F Cell Homogenization Room
Cap Horn Homogenizer	MISONIX/ASTRASON MODEL XL2020	—	3F Cell Homogenization Room
Polytron Homogenizer	KINEMATICA/MODEL PT1200E	—	3F Cell Homogenization Room
Bead Mill Homogenizer	Bertin Technologies/Minilys	100/use	3F Biological Sample Analysis Lab 1

BIOCHEMISTRY	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Chromatography Chamber	NIHON FREEZER/MC-30EF3	500/rack/m	3F Frozen Strage Room
Electronic Balance	SHIMADZU/AUW320	—	2F Molecular Biology Analysis Lab
High Performance Liquid Chromatograph	SHIMADZU/Nexera	unfixed	2F MS Spectrometry Lab
	SHIMADZU/HPLC System	200/use	2F Biochemical Analysis Lab 1
HPLC AKTA System	GE Healthcare/AKTA purifier 100	200/use	2F Biochemical Analysis Lab 1
Gas Chromatograph Mass Spectrometer	SHIMADZU/GCMS-QP5050A	100/use	2F MS Spectrometry Lab
Time-of-Flight Mass Spectrometer	SHIMADZU/MALDI-TOF/MS AXIMA Confidence	1,000/use	2F MS Spectrometry Lab
X-ray Diffractometer	Philips/MPD-1880	1,000/use	1F X-ray Irradiation Lab
DNA Sequencer	ABI/PRISM 3130XL GeneticAnalyzer	(ELP)200/sample (ELP+Seq)600/sample	3F Gene Analysis Lab
	HITACHI/DS3000	(ELP)250/sample (ELP+Seq)650/sample	3F Gene Analysis Lab
Acoustic Solubilizer	Covaris/S220	100/use	2F Molecular Biology Analysis Lab
Real Time Quantitative PCR (LightCycler)	Roche/LightCycler480 System II	100/use (Plate)8,052/set	2F Molecular Biology Analysis Lab 2F CRL Office
Thermal Cycler	ABI/GeneAmp PCR System 2720, Roche/LightCycler, Thermo /MiniAmp Plus	—	2F Molecular Biology Analysis Lab
Electrophoresis Apparatus	Pharmacia/IPG Phor	500/use	2F Protein Engineering Lab
Bioanalyzer	Agilent Technologies/Agilent 2100 Bioanalyzer Limited	100/use	2F Molecular Biology Analysis Lab
Suspension Array System	Bio-Rad/Bio-Plex200	3,000/use	4F Cell Engineering Lab 4
Sample Derivatization System	Thermo Fisher/Reacti-Therm	200/h	2F Protein Engineering Lab
Sample Concentrator		200/h	2F Protein Engineering Lab
MOE (Molecular Operating Environment)	MOLSIS	—	3F Gene Analysis Lab

MORPHOLOGY	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Transmission Electron Microscope	HITACHI/HT7800	unfixed	4F Electron Microscope Lab
Field Emission Scanning Electron Microscope	JEOL/JSM-7505FA	2,000/h	4F Electron Microscope Lab
Scanning Electron Microscope	JEOL/JSM-6010LA	2,000/h	4F Electron Microscope Lab
Ultramicrotome	Reichert/ULTRACUTE	500/use	4F Microscopy Sample Preparation Room 1
Color CCD Camera	Nikon/ECLIPSE Ni-E	100/use	4F Image Processing Room
	NIPPON ROPER/Retiga2000R	100/use	4F Cell Culture Room
Live Cell Imaging Microscope	Andor/Dragonfly201	300/h(Day Max 5,000)	4F Confocal Laser Scanning Microscope Lab 1
High-resolution Fluorescence Microscope	GE/DeltaVision Elite	200/use	4F Microscope Lab 1
All-in-One Fluorescence Microscope	KEYENCE/BIOREVO BZ-9000	2,000/h	4F Image Processing Room

MORPHOLOGY	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Inverted Fluorescence Microscope	OLYMPUS/IX83	100/use	4F Microscope Lab 2
Confocal Laser Scanning Microscope	LEICA/STELLARIS 8	1,000/use	4F Confocal Laser Scanning Microscope Lab 2
	LEICA/TCS SP8 X	1,000/use	4F Confocal Laser Scanning Microscope Lab 3
	Nikon/AX with NSPARC	1,000/use	4F Fluorescence Microscope Lab
	OLYMPUS/FV1000-D	1,000/use	3F Biological Sample Analysis Lab 1
Microtome	LEICA/SM2010R	100/use	4F Microscopy Sample Preparation Room 2
Tissue Processor	SAKURA/Tissue-Tek VIP 6-J0, etc.	1,000/use	4F Microscopy Sample Preparation Room 2
Tissue Embedding Console	SAKURA/Tissue-Tek 6	100/piece	4F Microscopy Sample Preparation Room 2
Cryostat	LEICA/CM3050 S	500/use	4F Microscopy Sample Preparation Room 2
3D/4D Image Analysis and Visualization Software	BITPLANE/Imaris	100/use	4F Image Processing Room

CELL CULTIVATION	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Nucleofector	LONZA/4D-Nucleofector, amaxa/Nucleofector	100/use	4F Cell Culture Lab
CO2 Incubator	YAMATO/IP400, SANYO/MCD-175, ESPEC/BNA-111, HIRASAWA/CPD-2701	45,000/y + CO2 cost	4F Cell Culture Lab
Clean Bench (Laminar Flow Cabinet)	ESCO/Airstream PRO ESC-BCB-4A7, Showa Kagaku/S-1801WBV, etc.	—	4F Cell Culture Lab
Flexercell	FLEXERCELL/FLEX-I	2,000/use	4F Cell Culture Lab
Microinjection System	Eppendorf/InjectMan NI2, OLYMPUS/IX-73	100/use	4F Cell Engineering Lab 3
Flow Cytometer	BD/FACSCalibur·FACSCanto II	1,500/use	4F Cell Engineering Lab 2
	BD/LSRFortessa	1,500/use	4F Cell Engineering Lab 4
	Beckman Coulter/CytoFLEX S	1,500/use	4F Cell Engineering Lab 1
Cell Sorter	BD/FACSAria Fusion	5,000/use (Analysis)1,500/use	4F Cell Engineering Lab 4
Magnetic Cell Sorter	Miltenyi Biotec/autoMACS Pro Separator	3,500/use (No consumables)1,100/use	4F Cell Engineering Lab 1
Cell Dynamic Analysis System	GE/EZ-TAXIScan	unfixed	4F Cell Culture Lab
Extracellular Flux Analyzer	Seahorse/XFe24	100/use	4F Cell Culture Lab
Deep Freezer (Frozen Strage Room) Container Basket	REVCO/ULT-1490-3J-D30, etc.	(Container)6,000/y (Drawer Case)4,000/y	3F Frozen Strage Room
Large Liquid Nitrogen Sample Storage Container	CHART/MVE Heco1536P-190AF·GB	550/m	4F Workroom
Biosafety Cabinet	ESCO/ClassII Type A2	—	4F Cell Engineering Lab 4
	Thermo/1387	—	4F Pathogenic Virus Lab
Preparative Ultracentrifuge	Beckman/Optima L-90K	100/10 min (5,000/More than 500min)	4F Pathogenic Virus Lab
High Speed Refrigerated Centrifuge	Beckman/Avanti J-E	200/use	4F Pathogenic Virus Lab

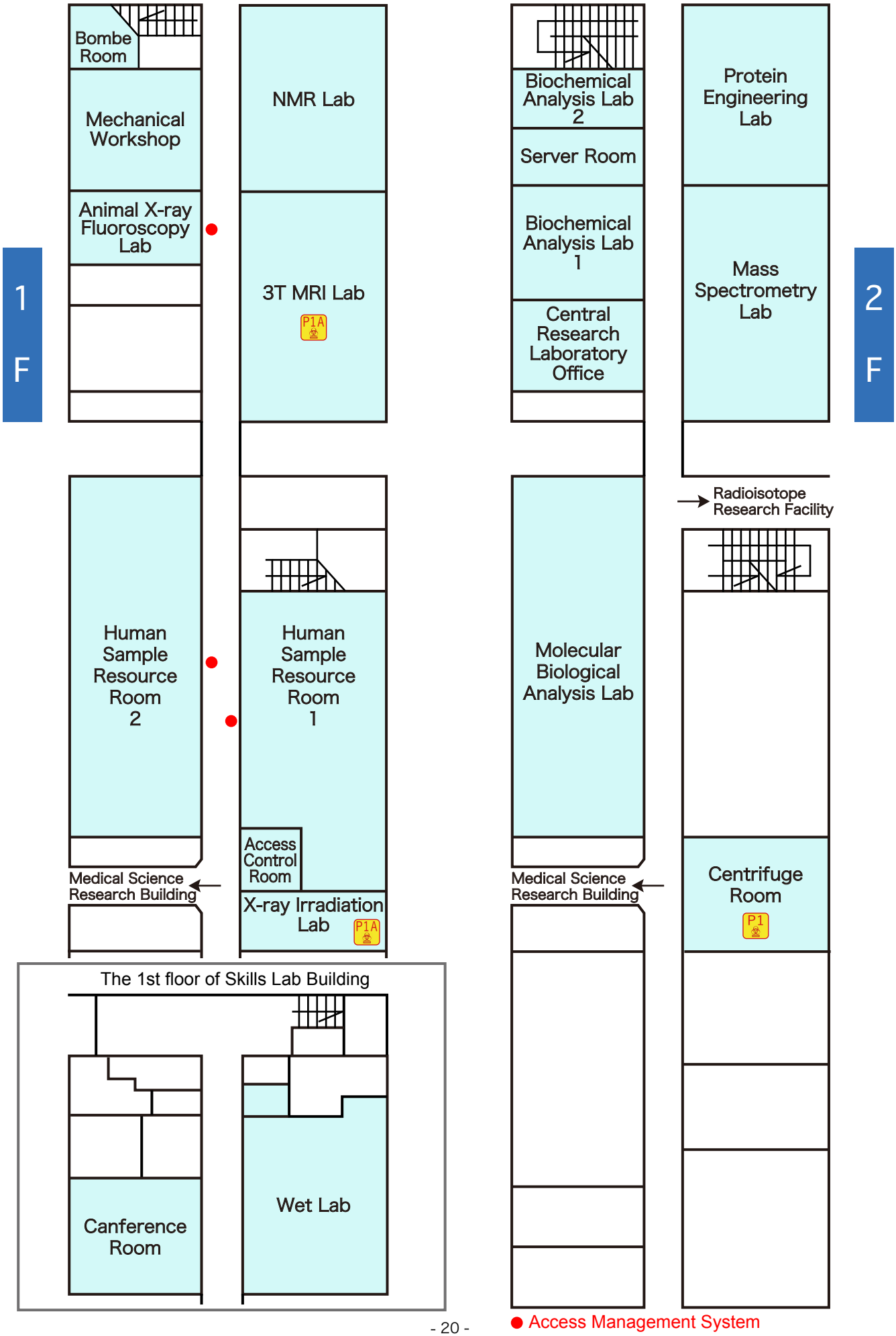
CELL CULTIVATION	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Tabletop Centrifuge	KUBOTA/KS-5000	—	4F Pathogenic Virus Lab
Tabletop Refrigerated Centrifuge	Beckman/Allegrax-30R	—	4F Cell Culture Lab
Ethylene Oxide Gas Sterilizer	ELK CORPORATION/SA-360ECO IKI/FRH36	3,000/use	4F Frozen Strage Room
X-ray Irradiator	AcroBio/RS320	1,000/use	Research Center for Animal Life Science

PHYSIOLOGY / ANIMAL	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Microdialysis	EICOM/HTEC-500	1,000/use	2F Biochemical Analysis Lab 1
Animal Blood Gas Analyzer	ABAXIS/VetScan VS2	—	3F Biological Sample Analysis Lab 1
Automatic Blood Cell Counter	NIHON KOHDEN/ Celltac α MEK-6550	200/sample	3F Biological Sample Analysis Lab 1
Oxidation Redox Analyzer	WISMERLL/REDOXLIBRA	100/use	3F Biological Sample Analysis Lab 1
Tetrapolar Bioimpedance Spectroscopy (BIS) Device	Bio Research Center/ImpediVET	100/use	3F Biological Sample Analysis Lab 1
C-arm X-ray Fluoroscope for Laboratory Animals	SIEMENS/ARCADIS Avantic Gen2	1,000/use	1F Animal X-ray Fluoroscopy Lab
Heart Perfusion System	ADInstruments/Langendorff	1,000/use	3F Biological Sample Analysis Lab 1
High-resolution Ultrasonic Echo Imaging System for Small Animals	VisualSonics/Vevo2100	250/15min (Day Max 5,000)	3F Small Animal Imaging Analysis Lab
In vivo Imaging System for Small Animals	Vilber-Lourmat/NEWTON 7.0	200/h	3F Small Animal Imaging Analysis Lab
3-Tesla MRI Scanner	SIEMENS Healthineers/ MAGNETOM Verio dot 3T	400,000/y 5,000/d, 1,500/h	1F 3T MRI Lab
4.7-Tesla MRI Scanner	BRUKER/BioSpec47/40USR	400,000/y 5,000/d, 1,500/h	Research Center for Animal Life Science

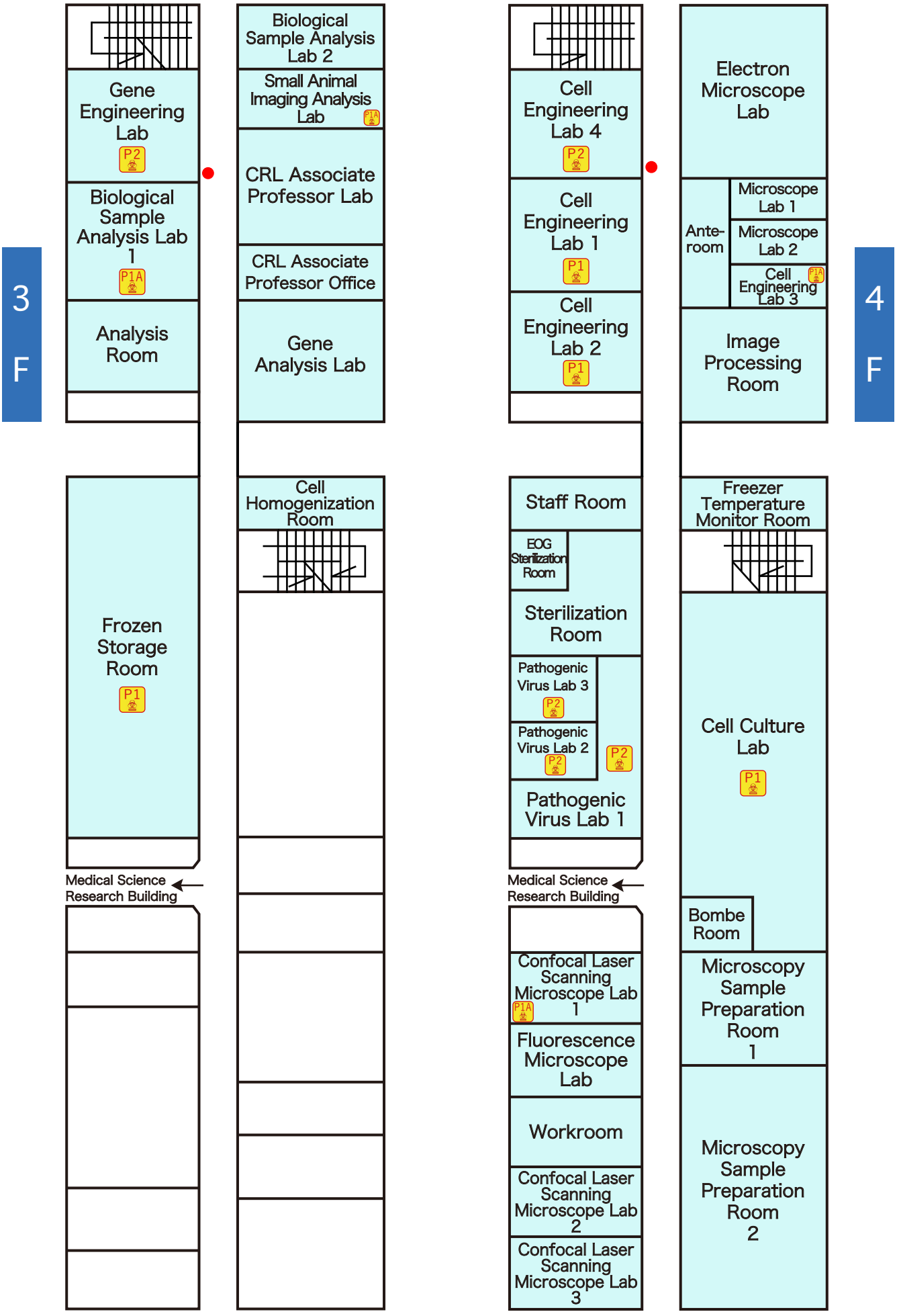
ADDITIONAL SERVICE	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Elix Water	MILLIPORE/Milli-Q Integral 5	10/ L	2F Biochemical Analysis Lab 4F Workroom
Milli-Q Water	MILLIPORE/Milli-Q Integral 5	80/ L	2F Biochemical Analysis Lab 4F Workroom
Ice Machine	Scotsman/F0522B Hoshizaki/FM-340AK-SA	—	2F Biochemical Analysis Lab 4F Workroom
Liquid Nitrogen	100 liter, 50 liter tank	450/L(Market Price)	4F Workroom
Oxygen Gas	purity 99.5%, 4.0Kg/cm^2	4,246/cylinder (Market Price)	1F Bombe Room 1F Wet Lab
Compressed Air		5,500/cylinder (Market Price)	1F Wet Lab
Human Sample Storing	REVCO, NIHON FREEZER	2,000/freezer/m	1F Human Sample Resource Room

WET LAB	DEVICE/SYSTEM	FEE (JPY)	LOCATION
Electric Knife	ellman/SURGITRON Dual EMC 90	—	1F Wet Lab
Small Animal Anesthetizer	SHIN-EI INDUSTRIES/A.D.S.1000	—	1F Wet Lab

1F・2F of Central Research Laboratory



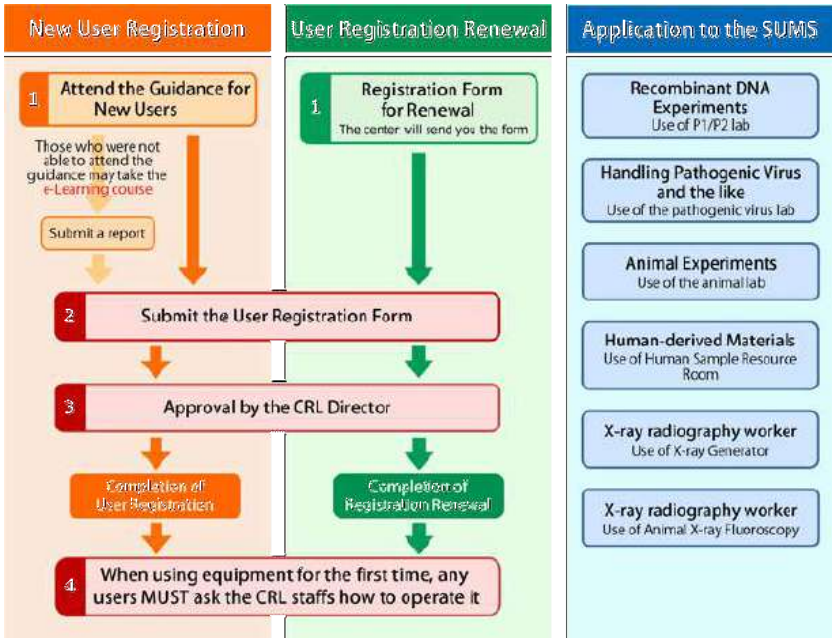
3F・4F of Central Research Laboratory



● Access Management System

Application Procedures for New User Registration

Those who wish to use the facilities and equipment of Central Research Laboratory (CRL) must be registered users. To be the user, they are required to take the Guidance for New Users managed by CRL. Depending on the nature of the experiments they plan to conduct, other application procedures may be required in addition to the user registration.
They must complete the necessary procedures according to the section they wish to use and the type of experiments they are planning to conduct.
Once you have completed the registration ・・・
Each piece of equipment at the CRL has its own rules on how to reserve and use it. If you use equipment for the first time, please be sure to ask the staff member in charge of the equipment how to use it before using it, rather than having your lab members teach you how to use it.



Items that Require Application to the University

- ✓ Recombinant DNA Experiments: Application to the SUMS Genetic Recombination Experimentation Safety Committee (Research Promotion Division)
- ✓ Experiments Handling pathogenic microorganisms: Application to the SUMS Biosafety Committee (Research Promotion Division)
- ✓ Experimental Animals: Application to the SUMS Animal Experimentation Committee (Research Center for Animal Life Science)
- ✓ Experiments with Animal X-ray Fluoroscope: Registration as an X-ray photographing worker (Research Promotion Division)
- ✓ Experiments with X-ray Irradiator: Registration as an X-ray worker (Research Promotion Division)
- ✓ Human Subjects Research: Application to the SUMS Ethics Committee

Instructions and Notes for Completing the "Application Form for CRL User Registration"

Those who conduct the following experiments at CRL must enter the approval number and other necessary information on the Form, and attach the prescribed documents, if necessary:

(1) **Recombinant DNA experiments**: Those who performing P1 and/or P2 level experiments must include their approval number. Additionally, the Gene Engineering Lab and/or Cell Engineering Lab users must contact the staff (Ext.2306) to register their ID card information for the entry/exit managing system.

(2) **Experiments handling pathogenic microorganisms**: Those who performing the experiments of this kind must include their approval number and submit the prescribed documents. Additionally, the Pathogenic Virus Lab and/or Cell Engineering Lab #4 users must contact the staff (Ext.2307) to register their ID card information for the entry/exit managing system.

(3) **Animal experiments**: Those who performing the animal experiments must include their approval number.

(4) **X-ray experiments** (Animal X-ray Fluoroscope, X-ray Irradiator, X-ray Diffractometer): X-ray generator users are required to take the X-ray training course prior to using the equipment.

(5) **Human Sample Resource Room**: The HSR users must submit the prescribed form. Additionally, they must register their ID card information for the entry/exit managing system.

【Caution】Matters to be entered, documents to be submitted

Items	Approval number	Entry/exit managing system	Document to submit	Documents to submit	Staff (Ext.)
Recombinant DNA experiments	●	●			Terado (2306)
Handling pathogenic microorganisms	●	●	●	①CRL Application Form for Handling Pathogens, ②Application for Handling Pathogens (Form 1 or 2)	Mori (2307)
Experimental Animals	●				Terado (2306)
Animal X-ray Fluoroscope		●			Yamamoto (2304)
Wet Lab	●				Terado (2306)
Human Sample Resource Room		●	●	HSR Access Application	Yamamoto (2304)

EXAMPLE Take extra care not to make mistake or omit anything

2025 New User Registration Form

Central Research Laboratory (CRL), Research Equipment Section

I will abide by rules and regulations established by CRL.

Date	2025 / ○○ / ○○	User No. (CRL Entry)	
Affiliation	Department / Center of ○○		
Position	Graduate student		
Name	SHIGA Taro		
Staff (Student) ID number	88888888		
Extension/PHS number	2300		
e-mail address	hqcrl	@belle. shiga-med.ac.jp @g.shiga-med.ac.jp	
Head of department			

Your research projects

☑ Check the equipment that you plan to use

Items you plan to use

☐ Spectrophotometer	☐ Gel imaging	☐ Deep freezer
☐ Mass spectrometer	☐ Chromatography chamber	☐ Liquid nitrogen dewar
☐ Nuclear magnetic resonance	☐ Electron microscope	☐ Autoclave
☐ HPLC	☐ EM sample preparation	☐ Heart perfusion system
☐ Temperature control centrifuge	☐ Light microscope	☐ Small animal imaging
☐ Ultracentrifuge	☐ Microscope sample preparation	☐ in vivo imaging
☐ Lyophilizer	☐ Image analyzer	☐ VetScan
☐ Vaccume concentrator	☐ Laser microscope	☐ X ray fluoroscope
☐ Micro-dialysis analyzer	☐ Live imaging microscope	☐ X ray generator
☐ Homogenizer	☐ Fluorescence microscope	☐ MRI scanner
☐ DNA sequencer	☐ CO_2 incubator	☐ Millipore water
☐ Bioanalyzer	☐ MACS	☐ Liquid nitrogen
☐ Covaris solubilizer	☐ Flow cytometer	☐ Oxygen gas
☐ Bio-Plex suspension array	☐ Cell sorter	☐ Handicraft tools
☐ MOE (Molecular Operating Environment)	☐ EZ-TAXIScan	☐ Human sample storage
☐ Chemilumi imaging	☐ Nucleofector	☐ Wet lab
☐ PCR/qPCR	☐ Flux analyzer	

Please fill in the following fields only if your experiment at CRL is involved in recombinant DNA, pathogenic viruses and microorganisms, or animal use.
※ Access control laboratories with ID card authentication

☑ **Recombinant DNA** ☐ New ☐ Renewal	Approved No.	5-1	Supervisor's name		Affiliation	
	Approved room	☑ Genetic Engineering Lab ※ ☐ 3T MRI Lab ☐ Biological Sample Analysis Lab 1 ☐ Cell Engineering Lab 1 ☐ Cell Engineering Lab 3		☐ X-ray Irradiation Lab ☐ Animal Imaging Lab ☐ Cell Culture Lab ☐ Cell Engineering Lab 2 ☐ Cell Engineering Lab 4		
☑ **Pathogenic viruses** ☐ New ☐ Renewal	Approved No.	5-1	Supervisor's name		Affiliation	
	Approved room	☑ Pathogenic Virus Lab ※		☐ Cell Engineering La...		
☑ **Animal experiments** ☐ New ☐ Renewal	Approved No.	2024-1	Supervisor's name		Affiliation	
	Approved room	☑ X-ray Fluoroscopy Lab ※ ☐ 3T MRI Lab ☐ Biological Sample Analysis Lab 1		☐ Wet Lab ☐ Animal Imaging Lab ☐ Cell Engineering Lab 3		

contact the staff (ext. 2307) and follow the prescribed

【NOTE】 Any person who is engaged in the operation of recombinant DNA experiments, experiments handing pathogenic microorganisms, animal experiments must comply with the regulations in life science. research.