



TITLE	Guidelines that Govern the Use and Management of Equipment in FHS		
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READERS	FHS_GRP		

EFFECTIVE DATE	REVISION	REVISION CONTENT
15/06/2022	000	First Release; this set of guidelines supersedes Equipment Sharing Policy.
01/11/2022	001	Second Release; this revision includes the terms that govern the approval of equipment loan to a non-UM premise.
17/08/2023	002	Third Release; this revision includes additional of special training's requirements under Appendix 6B.

1 Purposes

- 1.1 To ensure convenient access to the shared equipment by all researchers of FHS.
- 1.2 To ensure a safe, productive and pleasant working environment in FHS.
- 1.3 To allow proper management of equipment purchased by UM.

2 Basic Principle of Equipment Management

- 2.1 All equipment in FHS are required to be shared among all users of FHS and UM.
However, small equipment that cost below MOP24,000 can mostly be used by the proposing research laboratory due to their highly frequently used nature.
- 2.2 The management of an equipment that costs over MOP250,000 strictly abides *Rules of UM Academic Equipment Management (RSKTO.04/202010/921.r00)*.



2.3 Every piece of equipment is managed by at least one designated person in FHS, the so-called “Person in-charge”. The identity of “Person in-charge” is stated on the equipment. The “Person in-charge” can be a technician in-charge (TIC), Core Operation Manager (Core OM), Core Research Assistant/Technician (Core RA), or Lab Representative (LR) depending on the ownership of the equipment. The roles of “Person in-charge” are as follows:

2.3.1 Technician-in-charge (TIC) (Appendix 1)

- is appointed by FHS.
- is responsible for:
 - (1) Managing the equipment that are governed by the Faculty Equipment Team and are mostly located in the communal equipment rooms in E12 and N22;
 - (2) Coordinating with the LRs of the same floor for all other equipment;
 - (3) Serving as a general contact point for users from other floors;
 - (4) Preparing and updating the equipment list on a regular basis for the floor;
 - (5) Posting the compiled equipment list on the corridor and online homepage.

2.3.2 Core Operation Manager (Appendix 2)

- is appointed by FHS.
- is responsible for:
 - (1) Overseeing all matters related to the Core;
 - (2) Supervising the Core Technicians and Core RAs to provide service to the Core users;
 - (3) Monitoring the budget and expenses of the Core;
 - (4) Taking lead to introduce new technology that benefits the research development of FHS;



- (5) Preparing and updating the equipment list of the Core on a regular basis.

2.3.3 Core RA/Technician (Appendix 2)

- is recruited by FHS.
- is responsible for:
 - (1) Managing the equipment in the Core;
 - (2) Providing service to the users who have requested service from the Core;
 - (3) Assisting Core OM to monitor the operation of the Core;
 - (4) Preparing and updating the equipment list on a regular basis for the Core.

2.3.4 Lab Representative (LR) (Appendix 3)

- is nominated by individual PIs.
- is preferred to be a RA to Postdoc rather than student.
- is responsible for:
 - (1) Managing the equipment that belong to the PI; daily tasks include booking, training and daily maintenance of the equipment of the PI;
 - (2) Serving as a contact point for other users who wish to use the equipment in the laboratory;
 - (3) Preparing and updating the equipment list on a regular basis for the laboratory;
 - (4) Posting the compiled equipment list for the laboratory and the contact information on the laboratory door.

2.4 The Equipment and Space Management Committee (ESMC) oversees the overall equipment management in FHS, reviews the operation of the Core Facilities and the Equipment Team, and makes recommendation related to equipment management



and procurement to the Faculty Management. ESMC reports to Associate Dean (Research) of FHS.

- 2.5 Every piece of equipment in FHS belongs to one of three categories, and their maintenance costs are handled as follows:

Ownership Classification	Maintained by	Maintenance cost
Core Facilities	Core OMs, Core RAs or Core technicians	Individual Core Facilities
Communal Lab	Faculty Equipment Team or TICs	FHS
Side lab of individual lab	PIs or corresponding LR	PI (40%), labs of other users (40%) and Faculty (20%)
Inside individual lab	User with LR	PI

- 2.6 A user should always communicate with “person in-charge” of an equipment if he/she comes across any questions.

3 Eligibility to Use an Equipment

- 3.1 A user must have successfully completed necessary training(s) before he/she is eligible to operate an equipment. The relevant trainings include (but are NOT limited to) the safety training, training for operating a designated equipment, training for conducting a designated experiment, and/or training for waste handling.
- 3.2 The safety training is provided by the Faculty Safety Workgroup, and any FHS student and researcher is required to complete this training before he/she can work in a FHS lab. A new member of FHS shall take lead to contact the Laboratory Safety Officer of FHS for the training schedule.
- 3.3 The requirement for completing the official training for an equipment varies among different equipment. A user shall contact the “person in-charge” stated on the equipment for arranging the training. The user shall set aside sufficient time for the training arrangement as the training may only be scheduled periodically.



- 3.4 It is recommended to receive the training only when the user has a concrete experiment plan to use the equipment, i.e. within two months before the use of the equipment. The access to the equipment may be revoked if the trainee has NOT begun using the equipment two months after the completion of the training.
- 3.5 For certain equipment, a newly trained user may only be granted the access to use the instrument independently after he/she has operated the equipment under the supervision of "person in-charge" for a few sessions. The "person in-charge" shall provide the relevant requirements to the user in the training.
- 3.6 A user can request to repeat the training session if the user has failed the training(s) before or does NOT use the equipment after an extended period of time. A maximum of three training sessions for the same equipment at the same level are allowed to repeat by a user. Those who arrive late for more than 15 minutes will NOT be allowed to attend the training, and this counts toward one of the three quotas.
- 3.7 An eligible user is granted right to reserve the equipment after completing the official training. In general, only eligible user can reserve an equipment via the online booking system.
- 3.8 If the equipment is located in a venue to which a room access is required, the eligible user can collect the venue access right from the Faculty Office (N22-3044 or E12-4045). To receive the access right, the eligible user has to complete "Laboratory Entry Authorization Form (FHS_Form_041)", including the endorsement(s) from the corresponding approver as stipulated in the form before visiting the Faculty Office.

4 Reservation

- 4.1 Only eligible users can make reservation for equipment.
- 4.2 An eligible user can reserve the equipment through the corresponding LR(s) for equipment inside the PI laboratories (Appendix 4), through online system at (<https://ec-book.fhs.um.edu.mo>) or through logbook system for other equipment



(Appendix 5) every time before using the equipment, unless the equipment is marked as “*No Reservation Required*”.

- 4.3 An eligible user is required to reserve equipment with his/her own account.
- 4.4 An eligible user should cancel the reservation as soon as possible and before the reserved usage time if there is a change of the experimental plan, so that the equipment can be available to others.

5 Usage of Equipment

A user should:

- 5.1 **NEVER** use an equipment without official training and/or registration.
- 5.2 Communicate with the “person in-charge” when there is issue, question or problem with the equipment before conducting the experiment.
- 5.3 Take the lead to ensure that all materials used for the experiment are compatible with the equipment. The compatibility issue may arise from reagents, experimental wares, biohazardous level and contagious nature. When uncertain, it is necessary to clarify with the “person in-charge” before using the equipment.
- 5.4 Fill in the equipment log book **BEFORE** and **AFTER** using the equipment.
- 5.5 Inspect the equipment for any damage or abnormality before using the equipment, and report to the “person in-charge” immediately for further instructions if the equipment is **NOT** normal. If the “person in-charge” is **NOT** reachable, write down the abnormality in the remark column of the equipment log book and do **NOT** use the equipment. The equipment is assumed normal if no report of malfunction or abnormality is received.
- 5.6 Prepare samples following the specific requirement of the equipment, and operate the equipment by following the standard procedures.
- 5.7 When encountering any uncertainty, problem, abnormality, incident, and/or accident during the operation, **STOP** using the equipment and report to the “person in-charge”



immediately for further instructions. If the “person in-charge” is NOT reachable, write down the details of the issue in the remark column of the equipment log book.

- 5.8 Clean up, refill reagents, run cleaning cycles, empty waste, reset equipment to its default setting, turn off the equipment by following specific working instructions or SOPs, and/or take away all personal belongings after using the equipment. Yet, **NEVER** remove reagents or accessories of the equipment without prior permission.
- 5.9 Bring proper consumables according to the operation requirements of the equipment.
- 5.10 Label all samples, reagents, chemicals, plastic and glassware clearly that are brought to the equipment, including user name, sample name, and date.
- 5.11 Only operate an equipment that requires a designated person to operate on his/her own after collecting a proper approval from the “person in-charge”.
- 5.12 Transfer experimental data via network whenever possible. If the equipment is NOT connected to internet, transfer data using DVD disc or any other virus-free storage device as instructed. It is recommended to transfer the experimental data within one week after the experiment as they will be removed from the equipment thereafter without further notice.
- 5.13 Always use his/her own campus card to enter the equipment room.
- 5.14 Keep the doors of the equipment room locked at all times to avoid entry of unauthorized personnel.
- 5.15 **NEVER** bring unauthorized person(s) into the equipment room without prior permission.

6 Acknowledgment

- 6.1 Whenever there is a publication in which any data is derived from the use of the equipment and/or service of the Core Facilities, the publication should include proper acknowledgement of the Core Facilities in the “*Acknowledgements*” section. If the Core RA, Core OM and/or technician has contributed intellectually to the



experimental design and/or data analysis of the publication, an acknowledgement with name is strongly recommended. If the contribution to the publication is extensive with significant amount of data analysis, proper authorship for the contributing Core RA, Core OM and/or technician should be present.

- 6.2 It is necessary to include the accurate description of the major equipment used in the publication in the “*Method*” section of the publication, such as its name, manufacturer and its model.

7 Other Rules and Standard Operating Procedures (SOPs)

- 7.1 Each Core Facility defines core-specific rules and SOPs which are approved by the Faculty Academic Council (AC), and all users shall follow these core -specific rules and SOPs strictly.
- 7.2 A user should prepare samples strictly according to the specific requirements and SOPs of each equipment.
- 7.3 A user should communicate with the Core OM, Core RA and/or technician in advance for any request beyond the established SOPs.

8 Warning/ Penalty System

- 8.1 The warning/penalty system is in place to discourage improper use of the equipment. The Faculty Equipment Team and the Core Facilities share a similar warning/penalty system.
- 8.2 When an equipment user is found to have committed an offence, a warning may be issued. The offences that are considered violations are nominated by the Faculty Equipment Team and the Core Facilities, and are further classified into minor, intermediate and major violations depending on the severity of the offences (Appendices 6A to 6E). The classification is reviewed and endorsed by AC.
- 8.3 The warning system is defined as follows:



- 8.3.1 A warning is issued to the equipment user who has committed a minor violation. This warning is copied to the supervisor of the equipment user.
- 8.3.2 A warning is issued to the equipment user who has committed an intermediate violation or has accumulated warnings for three minor violations in a year. This warning is copied to the supervisor of the equipment user and the Core Advisory Committee.
- 8.3.3 A warning is issued to the equipment user who has committed a major violation or has accumulated warnings that are equivalent to two intermediate violations. This warning is copied to the supervisor of the equipment user, the Core Advisory Committee and Associate Dean (Research).
- 8.3.4 The warning is issued by Core OM or the Faculty Equipment Team, and is recorded by the Faculty Equipment Team.
- 8.4 The penalty issuance is defined as follows:
 - 8.4.1 An equipment user who has committed a violation will receive a written warning in which his/her supervisor is informed.
 - 8.4.2 An equipment user who has committed a minor violation will receive a penalty issued by the Core OM or the Faculty Equipment Team.
 - 8.4.3 An equipment user who has received a warning for an intermediate violation or three warnings for minor violations in a year will receive a penalty. If the violation(s) takes place in the Core Facilities, the Core OM suggests the penalty for the consideration of Core Advisory Committee Chair. If the offence takes place when using an equipment that is governed by the Faculty Equipment Team, the Faculty Equipment Team suggests the penalty for the consideration of Chair of the Faculty Equipment Team.
 - 8.4.4 An equipment user who has received a warning for a major violation or warnings that are equivalent to three intermediate violations will receive a penalty. The Core OM or the Faculty Equipment Team suggests the penalty



for the consideration of Associate Dean (Research) via the Core Advisory Committee Chair or the Chair of ESMC respectively.

8.4.5 More specific penalty schemes for the individual Core Facilities are available in Appendices 6A to 6E.

8.4.6 All penalties endorsed by the Core Advisory Committee Chair, Chair of ESMC and/or Associate Dean (Research) are reviewed and agreed by Dean.

8.5 Other severe offences that are NOT defined in Appendices 6A to 6E may be handled according to the *Student Disciplinary Regulations of the University of Macau SAO.03/201406/100.r00*.

9 Use by Non-FHS Members

9.1 The non-FHS UM member shall send the request for using the equipment to the “person in-charge” of the equipment. The identity of the “person in-charge” is published on UM Academic Equipment Information Management System. If in doubt, the member is encouraged to contact the Faculty Equipment Team.

9.2 The non-UM member shall send the request for using the equipment to the Faculty Equipment Team if he/she plans to use the equipment of FHS. The request form is available in the FHS website. The Faculty Equipment Team shall evaluate the request and forward it to the Core OMs or other “person in-charge” of the equipment for further reviews.

9.3 The request for using the equipment shall be reviewed and recommended by the “person in-charge” and the individual PIs, Core OMs or the Faculty Equipment Team depending on the ownership classification of the equipment. Further endorsement by ESMC and approval by Dean or his delegate shall be collected if the request for using the equipment is raised by a non-UM member who does not have a documented collaboration with FHS.

9.4 The “person in-charge” shall take lead to communicate with the non-FHS member who plans to use the equipment and provide relevant support for the operation.



- 9.5 The non-FHS member who uses the equipment of FHS shall bring his/her consumable for the experiment and/or is responsible for replenishing any other materials that are consumed for the experiment. The “person in-charge” shall provide the detailed requirement accordingly.
- 9.6 The operation of the equipment shall take place on site in FHS. If the equipment has to be taken outside UM for its operation, an approval of Finance Management Committee (FMC) is mandatory. The “person in-charge” with the help of the Faculty Equipment Team shall keep good records of the location of the equipment, such as updating the Asset Team the current location.

--- End ---



Appendix 1
Information of Technicians-in-charge (TIC)

Floor	Name	Email	Phone	Office
E12-1/F	Wendy SOU	wendysou@um.edu.mo	4976	E12- 3067
E12-2/F	Gavin CHEN	gavinchen@um.edu.mo	4952	E12- 3067
E12-3/F	Rick CHAN	rickchan@um.edu.mo	4983	E12- 3067
E12-G/F	Chelsia CHAU	chelsiachau@um.edu.mo	9136	E12- 3067
N22-2/F	Louisa PUN	louisapun@um.edu.mo	4794	N22-3044
N22-3/F	Athena CHAO	hlchao@um.edu.mo	4523	N22-3044
N22-4/F	Bonnie CHAN	cholengchan@um.edu.mo	4893	N22-3044



Appendix 2

Information of Core Operation Managers (OM)

Core	Name	Email	Phone	Office
Animal Research Core (ARC)	Dr. Heng SUN	hengsun@um.edu.mo	8803	N22-3067
Bioimaging and Stem Cell Core (BISC)	Dr. Weiwei LIU	weiweiliu@um.edu.mo	(Office) 4982 / (Lab) 2921	(Office) E12-3025 / (Lab) N22- 2006
Genomics, Bioinformatics and Single Cell Analysis Core (GBSC)	Dr. Kaeling TAN	kaelingtan@um.edu.mo	(Office) 4987 / (Lab) 4232, 9161	(Office) E12-4026 / (Lab) E12- 2075/ 2077/ 3019
Proteomics, Metabolomics and Drug Development Core (PMDD)	Dr. Li WANG	liwang@um.edu.mo	(Office) 4498 / (Lab) 4291	(Office) E12-4024 / (Lab) N22- 4011



Information of Core RAs / Technicians

Sections of Core	Name	Email	Phone	Office
Aquatics (ARC)	Phoenix LEI	phoenixlei@um.edu.mo	4224	N22-3044
Rodent (ARC)	Avery TAM Xiaotong TAN Shaowen WANG	averytam@um.edu.mo; xiaotongtan@um.edu.mo; swenwang@um.edu.mo	4802 4221	N22-3069 N22-4007
Flow Cytometry (BISC)	Louisa PUN	louisapun@um.edu.mo	4794	N22-3044
Histopathology (BISC)	Erina WONG Haixi LI	erinawong@um.edu.mo; haixili@um.edu.mo	2912	N22-3040
Microscopy & Bioimaging (BISC)	Liangyu SUN Ka Kun WU	liangyusun@um.edu.mo; kakunwu@um.edu.mo	2086/ 2912	N22-3040
Stem Cell (BISC)	Erina WONG Haixi LI	erinawong@um.edu.mo; haixili@um.edu.mo	2912	N22-3040
Genomics & Bioinformatics (GBSC)	Tiffany IU Yu HAN	tiffanyiu@um.edu.mo yuhan@um.edu.mo	4231 2086	E12-3067 N22-3011
Single Cell Analysis (GBSC)	Tiffany IU	tiffanyiu@um.edu.mo	4231	E12-3067
Drug Development (PMDD)	Man DOU	mandou@um.edu.mo	4291	N22-4011
Metabolomics (PMDD)	Man DOU	mandou@um.edu.mo	4291	N22-4011
Proteomics (PMDD)	Kate, Man Kei LEI	katelei@um.edu.mo	2086	N22-3011



Appendix 3
Information of Lab Representatives (LR)

Lab Floor	PI	Name	Email	Phone	Office
E12-1/F	Yunlu DAI	Yuzhao FENG	Yc27608@um.edu.mo	4222	E12-1023
	Xuanjun ZHANG	Yongjie SUN	yc17618@um.edu.mo	2914	E12-1023
	Zhen YUAN	Yuhao CHEN	yuhaochen@um.edu.mo	2509/ 2736	E12-1032
	Vivien WANG	Wenfei PAN	yb87628@um.edu.mo	2950	E12-1033
	Yutao XIANG	Cai HONG	yc07640@um.edu.mo	2761	E12-1056
	Robert David SMITH	Wen DANG	Yc27639@um.edu.mo	2761	E12-1056
E12-2/F	Qi ZHAO	Ziang GUO Jiaqi WANG	yc07621@um.edu.mo; yc07602@um.edu.mo	2736	E12-3017
	Chris WONG	Kaeling TAN Winnie CHONG	kaelingtan@um.edu.mo; yc07617@um.edu.mo	4232	E12-3019
	Wenhua ZHENG	Yitian CHEN	Yc07666@um.edu.mo	2731	E12-3039
	Ruiyu XIE	Ruiyu XIE	ruiyuxie@um.edu.mo	2902	E12-3043
E12-3/F	Peng WANG	Dan CHEN	yc27626@um.edu.mo	N/A	E12-3041
	Terence POON	Jiajia XU	yc27602@um.edu.mo	2534	E12-3038
	Hanming SHEN	Charlie CHEONG	charliecheong@um.edu.mo	2079	E12-3038
	Hongjie ZHANG	Yingchao GENG	YB67643@um.edu.mo	2732	E12-3039
	Ningyi SHAO	Yusi LI	yusili@um.edu.mo	4521	E12-3042
	Garry WONG	Rongzhen LI	yc07606@um.edu.mo	2947	E12-3045
	Leo LEE	Hinkit KOU	hinkitkou@um.edu.mo	2951	E12-3048
	Henry KWOK	Ziqi LIN	yc17669@um.edu.mo	4219	E12-3051



Faculty of Health Sciences
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	Chen MING	Chuhao LI	yc27658@um.edu.mo	2014	E12-1036
	Xiaofan DING	Yanzhen CHEN	yanzhenchen@um.edu.mo	9105	E12-3056/3058

Lab Floor	PI	Name	Email	Phone	Office
N22-2F	Kin Yip TAM	Junqiu HE	yc07626@um.edu.mo	2907	N22-2001
	Ren-he XU	Changkun YANG	yc07652@um.edu.mo	2908	N22-2003
	Guokai CHEN	Weiwei LIU	weiweiliu@um.edu.mo	2921 / 4982	N22-2006
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	Tzu-Ming LIU	Mo Xin LI	moxinli@um.edu.mo	4217	N22-2027
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Faculty of Health Sciences
Appendix 3 for Guidelines that Govern the
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	Kathy LUO	Hao JIA	haojia@um.edu.mo	4283	N22-4039
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Appendix 4
List of Equipment Inside PI labs

PI	Equipment name	Model	Brand	Location	Category
CXD	Shaking Incubator	MaxQ 2000	Thermo	N22-4033a	Bacterial/Shaking incubator
CXD	Bioanalyzer	2100	Aligent	N22-4033a	Bioanalyzer
CXD	Cell Counter	Cellometer Auto 2000	Nexcelom	N22-4033aa	Cell Counter
CXD	Electroporation System	Gene Pulser Xcell	Bio-Rad	N22-4033aa	Electroporation/Transfection
CXD	Transfection System	Neon®	Invitrogen	N22-4033aa	Electroporation/Transfection
CXD	Inverted microscope	TS100F	Nikon	N22-4033a	Microscope
CXD	Vibrating Blade Microtome	VT1200 S	Leica	N22-4033a	Microscope
CXD	Nanodrop	8000	Nanodrop	N22-4033aa	Spectrometer
CXD	Fluorescence Upright Microscope	BX53	Olympus	N22-4035	Microscope
DXZ	Portable Patient Sleep Screener	YH-600A Pro	BMC	E12-1025 (Tentative)	Others
DXZ	Continuous Blood Glucose Monitoring System	G4	Dexcom	E12-1025 (Tentative)	Others
DXZ	Nanopore Sequencing Device	MinION Enhanced	Oxford Nanopore	E12-2069 (Tentative)	Others
EC	Cell Counter	NUCLEOCOUNTER® NC-200™	ChemoMetec	N22-4002a	Cell Counter
EC	Benchtop Hybridization Oven	HybEZ™	ACD	N22-4002a	Others
EC	Slide Hybridizer	S2-15130	DAKO	N22-4002a	Others
EC	Real-Time PCR (96/384 wells)	Lightcycler 480	Roche	N22-4002a	Real-Time PCR
EC	Microplate Reader	StarGazer-384	Harbinger	N22-4002a	Spectrometer
Faculty	Automatic color colony counter	Scan®1200	Interscience	E12-2073a	Cell Counter
Faculty	Modular Electroporation System for Transfecting Cells	Gene Pulser Xcell™	Bio-Rad	E12-2073	Electroporation/Transfection
Faculty	Dissecting microscope	SMZ 800N	Nikon	N22-3005 E12-2073a	Microscope
Faculty	Thermal Cycler (96 wells)	T100	Bio-Rad	E12-2073	PCR machine
Faculty	Thermal Cycler (dual 48/48 wells)	C1000 Touch	Bio-Rad	E12-2073	PCR machine
Faculty	Nanodrop	ND-ONEC-W	Thermo Scientific	E12-2073	Spectrometer
Faculty	Microplate/cuvette reader	SpectraMax M5	Molecular Device	E12-2073	Spectrometer
Faculty	Sonicator	VCX800	Sonics	E12-2073	Sonicator
Faculty	Gel Imaging System	Touch Gel Documentation	Bio-rad	E12-2073	Gel doc
Faculty	Shaking incubator	Innova 42R	Eppendorf	E12-2073	Shaking incubator
Faculty	Shaking incubator	Innova 44	Eppendorf	E12-2073	Shaking incubator
Faculty	Automatic low-temperature rapid grinding machine	JXFSTPRP-I-02	上海淨信	E12-2073	Others
Faculty	Thermal Cycler (dual 48/48 wells)	C1000 Touch	Bio-Rad	E12-2073	PCR machine
Faculty	Flow cytometer	Cytoflex S	Beckman Coulter	E12-2073	Flow cytometer



PI	Equipment name	Model	Brand	Location	Category
Faculty	Live cell imaging system	THUNDER DMi8	Leica	E12-2068	Imaging system
Faculty	Protein transfer system	Trans-Blot Turbo	Bio-Rad	E12-2073	Others
GBSC Core	Liquid Handling Workstation	epMotion 5075t	Eppendorf	E12-3075a	Liquid handler
GGW&HJZ	Mechanical Pipette Puller	P-87	GWB	E12-3069a	Microinjection
GGW&HJZ	Micromanipulation System	5246	Eppendorf	E12-3069a	Micromanipulation System
GGW&HJZ	Micromanipulation System	TransferMan® 4r	Eppendorf	E12-3069a	Micromanipulation System
GGW&HJZ	Inverted Microscope	Axio Observer Z.1	Carl Zeiss	E12-3069a	Microscope
GGW&HJZ	Stereomicroscope	SMZ 800N	Nikon	E12-3069 E12-3069a	Microscope
GGW&HJZ	Fluorescence Stereomicroscope	SMZ 1270	Nikon	E12-3069a	Microscope
GGW&HJZ	Fluorescence Stereomicroscope	SMZ 18	Nikon	E12-3069a	Microscope
GGW&HJZ	Pipette Puller	PN-31	Scitech Korea	E12-3069a	Microinjection
GGW&HJZ	Ultrasonic cleaner	B8510E-DTH	Branson	E12-3069	Ultrasonic cleaner
GGW&HJZ	Thermal Cycler (dual 48/48 wells)	C1000 Touch	Bio-Rad	E12-3069	PCR machine
GGW&HJZ	Shaking incubator	Innova 40	Eppendorf	E12-3069	Shaking incubator
GKC	Protein Detection System	SNAP2MINI	Merck	N22-2008b	Gel Electrophoresis System
GKC	Tissue Chopper	95060-164	VWR	N22-2008b	Immunohistochemistry
GKC	Inverted Microscope	Primo Vert	Carl Zeiss	N22-2008a	Microscope
GL	Automated Cell Counter	Countess II	Thermo	N22-2032aa	Cell counter
GL	4D Nucleofector		Lonza	N22-2032aa	Electroporation/Transfection
GL	Antigen Retriever	62700-20	Electron Microscopy	N22-2032	Immunohistochemistry
GL	Fluorescent Cell Imager	ZOE	Bio-Rad	N22-2032aa	Microscope
GL	Stereomicroscope	SMZ 800N	Nikon	N22-2032a	Microscope
GL	Stereotaxic		RWD	N22-2032	Others
GL	GM Survey Meter with Probe	3007A	Arrow-Tech	N22-2032	Others
GL	PCR work station	Captair® Flex™ M 321	Erlab	N22-2032a	PCR Workstation
GL	Fluorometer	Qubit 4	Invitrogen	N22-2032a	Spectrometer
GL	Benchtop UV transilluminator	MUVB-111	Major Science	N22-2032	UV transilluminator
HFK	Nucleo Counter with Vial-Cassette	NC-200	Chemometric	E12-3071	Cell Counter
HFK	Inverted Microscope	Primo Vert	Carl Zeiss	E12-3071a	Microscope
HFK	Real-Time PCR (Deep well)	CFX96	Bio-Rad	E12-3071	PCR machine
HFK	UV-Vis Spectrometer	Nanodrop 2000c	Thermo	E12-3071	Spectrometer
HFK	Flow cytometer	C6 Plus	BD	E12-3071	Flow cytometer
HFK	Shaking incubator	SI600	Stuart	E12-3071	Shaking incubator
HFK	CO2 Shaking incubator	Minitron	Infors	E12-2069a	Shaking incubator



PI	Equipment name	Model	Brand	Location	Category
HMS	Incubating shaking	LOM-150-2	MRC	E12-3078	Bacterial/Shaking incubator
JSS	Analytical balance	ENTRIS224i-1S	Sartorius	N22-2029b	Balance
JSS	Precision balance	ML3002E	Mettler Toledo	N22-2029b	Balance
JSS	Electrnic balance	SPS202F	Ohaus	N22-2029b	Balance
JSS	Protein Detection System	SNAP i.d. 2.0	Merck	N22-2029b	Gel Electrophoresis System
JSS	Handheld Homogeniser (5mm diameter)	PT1200E	Fisher Scientific	N22-2029b	Homogenizer/Sonicator
JSS	96 Manual Pipetting System	Liquidator	Mettler Toledo	N22-2029b	Liquid handler
JSS	Auto Fluorescence Inverted Microscope Imaging System	EVOS FLc	Thermo	N22-2029b	Microscope
JSS	Inverted microscope	Primo Vert	Carl Zeiss	N22-2029b	Microscope
JSS	Illuminated Tail Vein Injection Unit		Kent Scientific	N22-2029b	Others
JSS	ThermoSafe Insulated Storage	Sonoco	Thermo	N22-2029b	Others
JSS	Touch Thermal Cycler (96-Deep Well)	C1000	Bio-Rad	N22-2029b	PCR machine
JSS	Microplate Reader	Spectramax M5	Molecular Devices	N22-2029b	Spectrometer
JSS	Benchtop UV transilluminator	3UV	UVP	N22-2029b	UV transilluminator
KHW	Microbiological Incubators	Heratherm	Thermo Scientific	E12-2077a	Bacterial/Shaking incubator
KHW	Thermal Cycler (96 wells)	C1000	Bio-Rad	E12-2077	PCR machine
KHW	Thermal Cycler (Dual 48 wells)	C1000	Bio-Rad	E12-2077	PCR machine
KHW	Bullet Blender Storm	BBY24M	Next Advance	E12-2077	Homogenizer/Sonicator
KHW	Stereo Microscopes	SZX7	Olympus	E12-2077a	Microscope
KHW	Matrix Wellmate	Matrix Wellmate	Thermo Scientific	E12-2077	Others
KHW	Vacuum Filtration System	BioVac 630B	Rocker	E12-2077	Others
KHW	Vacuum Blotting System with Blotting Pump	VacuGene XL	GE Healthcare	E12-2077	Others
KHW	Superspeed Centrifuge	Sorvall LYNX 6000	Thermo Scientific	E12-2077	Centrifuge
KHW	UV-Vis Spectrophotometer	Nanodrop One c	Thermo Scientific	E12-2077	Spectrometer
KHW	PCR work station	UVP	UV3	E12-2077	PCR Workstation
KHW	ChemiDoc Imaging System	MP	Bio-Rad	E12-2077	Gel Doc
KHW	Water Puridication System	Integral 10	Milli-Q	E12-2077	Water Purification
EL	Fluorometer	Qubit 4	Thermo	N22-3009a	Fluorometer
EL	Non-refrigerated Centrifuge	5425	Eppendorf	N22-3009a	Centrifuge
KM	Stereomicroscope	SZ61	Olympus	N22-3009a	Microscope
KM	Cell Counter	C100	RWD	N22-3009a	Cell Counter
KM	Thermo Cycler	C1000	Bio-Rad	N22-3009a	Thermo Cycler
KM	Mouse Embryo Micromanipulation System	IX73 & Femtojet 4i	Olympus & Eppendorf	N22-3009a	Microscope
KT	Pressured Gas Blowing Concentrator	MGS-2200E	Eyela	N22-2002	Concentrator



PI	Equipment name	Model	Brand	Location	Category
KT	Rotary Evaporator	N-1100D-WD	Eyela	N22-2002a	Evaporator
KT	High-throughput Tissue Homogeniser	Scientz-192	Scientz	N22-2022	Homogenizer/Sonicator
KT	Surgical Microscope for Small Animal Surgery	PSMB5N	World Precision	N22-3060	Microscope
KT	16 Channel Wireless Neural Spike Recording System	W16	Triangle BioSystems	N22-3060	Others
KT	Motorized Lab Standard with Mouse and Rat Adaptors	26-Sep-41	Stoelting	N22-3060	Others
KT	Single Cell Genetic Activity Stimulation System	Stimware	Triangle BioSystems	N22-3060	Others
KT	Morris Water Maze	25-Mar-91	Morris	N22-3060	Others
KT	Radial arm Water Maze	26-Mar-91	Morris	N22-3060	Others
KT	Epithelial Voltohmmeter	179021 AB09J	EVOM2	N22-2002	Others
LJD	Ultrasonicator	Q700-220	Qsonica	N22-4009a	Homogenizer/Sonicator
LJD	Hypoxia Working Station	C21/C274 chamber	Biospherix	N22-4009aa	Others
LJD	Microfluidic Platform	CellASIC™ ONIX	Merck	N22-4009a	Others
LJD	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	N22-4009a	PCR machine
LL	Incubating shaker	H1010-E	Benchmark	E12-3071	Bacterial/Shaking incubator
LL	Automated cell counter	Luna II	Logos	E12-3071	Cell Counter
LL	Vacuum Concentrator	Concentrator plus	Eppendorf	E12-3071	Concentrator
LL	Inverted Microscope with FITC and mCherry fluorescence	Ts2-FL	Nikon	E12-3071a	Microscope
LL	Sample disruption apparatus	TissueLyser II	Qiagen	E12-3071a	Others
LL	Peristaltic Pump	MFU-02	Major Science	E12-3071a	Others
LL	PCR System	ProFlex™	Life Technologies	N22-3037a	PCR Machine
LL	Microplate Spectrophotometer	Multiskan™ GO	Thermo Scientific	E12-3071	Spectrometer
QZ	Freezer dryer and Concentrator System - Vacuum Concentrator	Concentrator plus	Eppendorf	E12-2069	Concentrator
QZ	Cell Transfection System	4D-Nucleofector	Lonza	E12-2069a	Electroporation/Transfection
QZ	Electroporation System	Gene Pulser Xcell™	Bio-Rad	E12-2069	Electroporation/Transfection
QZ	Microplate Washer (96-well, 384-well)	Wellwash	Thermo	E12-2069	Microplate Washer
QZ	Microplate reader	SpectraMax iD5	Molecular Devices	E12-2069	Spectrometer
QZ	Protein purification system	AKTA pure 25M	GE Healthcare	E12-2069	Others
QZ	Flow cytometer	Cytoflex S	Beckman Coulter	E12-2069	Flow cytometer
QZ	Infrared Camera	Ti450	Fluke	E12-2069	Others
QZ	Automated cell counter	Luna II	Logosbio	E12-2069	Cell Counter
QZ	Thermal cycler	MiniAmp plus	Applied Biosystems	E12-2069	PCR machine
QZ	Biomolecular Interaction Analyzer	Octet K2	ForteBio	E12-2069	Others
QZ	CO2 Shaking incubator	Minitron	Infors	E12-2069a	Shaking incubator
RHXu	Nucleofector 4D	AAF-1002B	Lonza	N22-2004a	Electroporation/Transfection



PI	Equipment name	Model	Brand	Location	Category
RHXu	Electroporation System	Gene Pulser Xcel	Bio-Rad	N22-2004a	Electroporation/Transfection
RHXu	ChemiDoc Imaging System	Touch	Bio-Rad	N22-2004a	Gel Doc
RHXu	Image Cytometer	K2	Nexcelom	N22-2004aa	Image Cytometer
RHXu	Auto Fluorescence Inverted Microscope Imaging System	EVOS FL	Thermo	N22-2004b	Microscope
RHXu	Inverted Microscope	Axio Observer Z.1	Carl Zeiss	N22-2004aa	Microscope
RHXu	Inverted Microscope	CKX41	Olympus	N22-2004b	Microscope
RHXu	Inverted Microscope	CKX53	Olympus	N22-2004b	Microscope
RHXu	Stereomicroscope	SZX9	Olympus	N22-2004b	Microscope
RHXu	High Performance Microscopy Color Camera		Carl Zeiss	N22-2004aa	Others
RHXu	Thermal Cycler (Dual 48/48 well)	C1000 Touch	Bio-Rad	N22-2004a	PCR machine
RHXu	Thermal Cycler (96-Deep Well)	C1000 Touch	Bio-Rad	N22-2004b	PCR machine
RHXu	Microscope Enclosure	AC648TLFUV	AirClean	N22-2004a	PCR Workstation
RHXu	PCR Workstation	AC600	AirClean	N22-2004b	PCR Workstation
RYX	Automatic Cell Counter	Countless II FL	Thermo	E12-2071a	Cell Counter
RYX	Handheld Automated Cell Counter	PHCC20060	EMD Millipore	E12-2071a	Cell Counter
RYX	Tissue Chopper	10184-220	Ted Pella	E12-2071	Immunohistochemistry
RYX	Inverted Microscope	Axio Observer Z.1	Carl Zeiss	E12-2071a	Microscope
RYX	Gel Imaging System	Touch Gel Documentation	Bio-Rad	E12-2071	Imaging system
RYX	Fluorescence Stereomicroscope	SteREO Discovery V8	Carl Zeiss	E12-2071	Microscope
RYX	Blood Glucose Implantable Telemetry System		DSI	E12-2071	Others
RYX	UV-Vis Spectrometer	Nanodrop 2000c	Thermo	E12-2071	Spectrometer
RYX	Benchtop UV Transilluminator	DigiDoc-It	UVP	E12-2071	UV transilluminator
RYX	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	E12-2071	PCR machine
RYX	Cryostat	CM3050S	Leica	E12-2071	Others
RYX	Manual Rotary Microtome for Routine Sectioning	RM2235	Leica	E12-2071	Others
RYX	Fluorescence imaging system	EVOS FL	Life Technologies	E12-2071a	Imaging system
RYX	CO2 Shaking incubator	S41I	Eppendorf	E12-2071a	Shaking incubator
RYX	Antigen Retriever	62700-20	Electron Microscopy	E12-2071	Others
RYX	Inverted Fluorescence Microscope	Axio Observer Z1	Carl Zeiss	E12-2071	Microscope
Faculty	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	E12-3072	PCR machine
Teaching	Shaking Incubator	New Brunswick™	Eppendorf	E12-1061	Bacterial/Shaking incubator
Teaching	Low-Pressure Chromatography System	BioLogic LP	Bio-Rad	E12-G031	Chromatography
Teaching	Gel Imaging System	ChemiDoc™ XRS+	Bio-Rad	E12-1061	Gel Doc
Teaching	Upright Fluorescence Microscope	Ci-L	Nikon	E12-1061	Microscope



PI	Equipment name	Model	Brand	Location	Category
Teaching	Stereomicroscope	Ti-S	Nikon	E12-1061	Microscope
Teaching	Inverted Fluorescence Microscope	SMZ745T	Nikon	E12-1064	Microscope
Teaching	Oven	SMO5-2	Shel Lab	E12-1061	Oven
Teaching	Infrared Spectrophotometer	IRAffinity-1S	Shimadzu	E12-1065	Spectrometer
Teaching	Thermal Cycler (dual 48/48 well)	C1000	Bio-Rad	E12-1061	PCR machine
Teaching	UV-VIS Spectrophotometer	UV1800	Shimadzu	E12-1065	Spectrometer
Teaching	UV-VIS Spectrophotometer	Genesys 10S	Thermo Fisher	E12-1064	Spectrometer
Teaching	Low Pressure Chromatography System	C-805	Buchi	E12-G031	Chromatography
Teaching	Rotary evaporator	R-100	Buchi	E12-G031	Others
TML	Upright Microscopy	E100	Nikon	E12-2036	Microscope
TML	Fluorescence lifetime imaging microscopy system	--	Becker & Hickl	N22-3064	Microscope
TML	Digital Storage Oscilloscope	TDS2022C	Tektronix	E12-2036	Oscilloscope
TML	Small Animal Ventilator with Mouse Intubation Kit	RV-01	Kent Scientific	N22-3064	Others
TML	Thermal Power Sensor (Surface absorber)+ Laser Power Meter	S310C PM100A	Newport	N22-3064	Others
TML	Infrared Viewer (350-2000nm)	Miniature	Newport	N22-3064	Others
TML	Low-Flow Anesthesia System	SomnoSuite	Kent Scientific	N22-3064	Others
TML	MouseSTAT Pulse Oximeter and Heart Rate Monitor	MouseSTAT	Kent Scientific	N22-3064	Others
TML	Syringe Pump	GenieTouch	Kent Scientific	N22-3064	Others
TML	Chamlide TC System	CU-501	Quorum	N22-3064	Others
TML	Dual Channel High Performance Optical Power and	2963-R	Newport	E12-2036	Others
TML	Waveform/Function Generator	33612A	Keysight	E12-2036	Others
TML	Low-Profile Modular Power System Mainframe	N6700C	Keysight	E12-2036	Others
TML	Infrared Viewing Device	IRV1-2000	NewPort	E12-2036	Others
TML	Photomultiplier Detector	PMC-100-4, DCC-100PCI	Becker & Hickl	N22-3064	Others
TML	Photomultiplier Detector with router	PMC-150-04 & HRT-41	Becker & Hickl	N22-3064	Others
TML	Infrared Spectrometer	Extended IR	waveScan USB	N22-3002a	Spectrometer
TML	High-Resolution Spectrometer waveScan	S06274	A.P.E	E12-2036	Spectrometer
TML	Confocal Microscope System Controller	A1-SHRM-C	Nikon	N22-3064	Others
TML	Small Animal Ventilator with Mouse Intubation Kit	RV-01	Kent Scientific	N22-3064	Others
TML	High Pulse Energy Fiber Based Femtosecond Laser	Cazadero 1550m	Calmar Laser	N22-3064	Others
TML	Spectroscopy CCD	DV401A-BVF	ANDOR	N22-3064	Spectroscopy
TML	Spectrograph	Shamrock 193i-A	ANDOR	N22-3064	Spectroscopy
TML	Ultrasonic Cleaner	DC300H	Delta	N22-3064	Ultrasonic Cleaner
TML	Inverted Microscope Controller	TI2-CTRE	Nikon	N22-3064	Others



PI	Equipment name	Model	Brand	Location	Category
TML	Fluorescence Live Cell Imaging System	IX83	Olympus	N22-3005	Microscope
TML	Light-sheet multiphoton laser scanned microscope	-	Hamamatsu	E12-2036	Microscope
TML	Fiber Launching System	-	Thorlabs	E12-2036	Others
TML	Galvo Scanner	6240H	Cambridge Technology	E12-2036	Others
TML	Multiphoton Laser Scanning Microscope	A1RMP+ / Ti2-E	Nikon	N22-3064	Microscope
TML	High sampling-rate blood pressure monitor	PL3508/ MLT844/ FE221/	AD Instruments	N22-3064	Others
TML	Optical path routing system	-	-	N22-3064	Others
TML	High-precision linear motorized travelling system	UTS50CC + SMC-PS60	Newport	N22-3064	Others
TML	High precision optoacoustic modulation system	-	-	N22-3064	Others
TML	Physio Suite for Mice & Rats	PS-05	Kent Scientific	N22-3064	Others
TP	ChemiDoc	ChemiDoc Touch	Bio-Rad	E12-3070	Gel Doc
TP	IEF System	PROTEAN® i12	Bio-Rad	E12-3070	Gel Electrophoresis System
TP	Microplate washer	Hydroflex	Tecan	E12-3070	Microplate Washer
TP	Automating Multichannel Pipettes Platform	Viaflo ASSIST	Integra	E12-3070	Others
TP	Automated Liquid Handler	MSIA Versette	ThermoFisher	E12-3070	Others
TP	Trans-Blot Turbo Transfer Starter System	1704155	Bio-rad	E12-3070	Others
TP	Nitrogen Blowing Concentrator	MGS-2200B	Eyela	E12-3070	Others
TP	SPE 96-well plate extraction device	Positive Pressure-96 Processor	Waters	E12-3070	Others
VW	Shaking incubator	Innova 43R	Eppendorf	E12-1071	Bacterial/Shaking incubator
VW	Sonicator System	Q700	Qsonica	E12-1071	Homogenizer/Sonicator
VW	Peristaltic Pump	P-1	GE Healthcare	E12-1071	Others
VW	Radiosubstance detection system	IS1006	Azure Biosystems	N22-3033	Others
VW	Peltier-cooled incubator	IPP	Memmert	E12-1071	Bacterial/Shaking incubator
VW	Refrigerated Incubator	815-BOD	Thermo Scientific	E12-1071	Bacterial/Shaking incubator
VW	Pure Protein Purification system	AKTA Pure	GE Healthcare	E12-1071	Chromatography
VW	DNA Shearing System	Q800R3-220	Qsonica	E12-1071	Homogenizer/Sonicator
VW	Stereomicroscope	SZ61	Olympus	E12-1071	Microscope
VW	Nano-meter Grade Protein Crystallisation Screening	Mosquito® Crystal™	Ttplabtech	E12-1071	Others
WG	Automated Cell Counter	Countess	Thermo	N22-2035aa	Cell counter
WG	Refrigerated Bath Circulator	Nova	MRC	N22-2035a	Circulator
WG	Benchtop Concentrator Centrifuge	Concentrator Plus	Eppendorf	N22-2035a	Concentrator
WG	Super Electroporator	NEPA21	NEPA GENE	N22-2035aa	Electroporation/Transfection
WG	Bench-top Cryostat	CM1100	Leica	N22-2035a	Immunohistochemistry
WG	Paraffin Embedding Station and cold plate	EG 1150H & EG 1150C	Leica	N22-2035a	Immunohistochemistry



PI	Equipment name	Model	Brand	Location	Category
WG	Manual Microtome	RM 2235	Leica	N22-2035a	Immunohistochemistry
WG	Programmable Multipipetter Puller	PMP-107	WPI	N22-2035a	Microinjection
WG	Fluorescence Microscope	Ni-U	Nikon	N22-2035a	Microscope
WG	Confocal Microscope	AZ100	Nikon	N22-2035a	Microscope
WG	Confocal (Laser module)	AZ100	Nikon	N22-2035a	Microscope
WG	Confocal microscope	C2	Nikon	N22-2035a	Microscope
WG	Stereomicroscope	SMZ 18	Nikon	N22-2035a	Microscope
WG	Forced Air Oven	FX14-2 (1380FM)	Shel Lab	N22-2035a	Oven
WG	Touch Thermal Cycler (96-Deep Well)	C1000	Bio-Rad	N22-2035a	PCR machine
WG	PCR workstation	# 321	erLab	N22-2035a	PCR Workstation
WG	Touch Real-Time PCR (96-Deep Well)	CFX96	Bio-Rad	N22-2035a	Real-Time PCR
WG	Touch Real-Time PCR (384-Deep Well)	CFX384	Bio-Rad	N22-2035a	Real-Time PCR
WG	Fluorometer	Qubit 2.0	Invitrogen	N22-2035aa	Spectrometer
WG	UV-Vis Spectrometer	BioPhotometer Plus	Eppendorf	N22-2035a	Spectrometer
WG	UV-Vis Spectrometer	Nanodrop 2000c	Thermo	N22-2035a	Spectrometer
WHZ	Fluorescent Viability Cell Counter	Cellometer K2	Nexcelom	E12-2072a	Cell Counter
WHZ	ChemiDoc	ChemiDoc™ Touch	Bio-Rad	E12-2072	Gel Doc
WHZ	EVOS® FL Color Cell Imaging System	AMF4300	Life Technologies	E12-2072	Microscope
WHZ	Stereomicroscope	SZX16	Olympus	E12-2072	Microscope
WHZ	Stereoscope with camera	Stemi 508 with stand K;	Carl Zeiss	E12-2072	Microscope
WHZ	Laser Speckle Perfusion Imager	RFLSI Pro	RWD	N22-3065	Others



Appendix 5
List of equipment that reservation can be made through online or logbook system

PI	Equipment name	Model	Brand	Location	Category
Communal	Microplate Reader	VICTOR X3	PerkinElmer	E12-3076	Spectrometer
Communal	Shaking Incubator (variable temperature)	Innova 40R	Eppendorf	E12-3076	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	Brunswick Innova 44R	Eppendorf	E12-3076	Bacterial/Shaking incubator
Communal	Gel Imaging System	ChemiDoc™ Touch	Bio-Rad	E12-3076	Gel Doc
Communal	Thermal Cycler (96 wells)	T100	Bio-Rad	E12-3076	PCR machine
Communal	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	E12-3076	PCR machine
Communal	Countess II FL Automated cell counter	Life Technologies	AMQAF1000	E12-3076	Cell Counter
Communal	CellDrop Brightfield cell counter	Denovix	CellDrop BF	E12-3076	Cell Counter
Communal	Gel Imaging System	ChemiDoc™ Touch	Bio-Rad	E12-1072	Gel Doc
Communal	Shaking Incubator (variable temperature)	Innova 40R	Eppendorf	E12-1073a	Bacterial/Shaking incubator
Communal	Incubator (65°C)	BD115	Binder	E12-2076	Bacterial/Shaking incubator
Communal	Incubator (37°C)	IN55	Memmert	E12-2076	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	Hybaid Shake n Stack	Thermo	E12-2076	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	MaxQ 4000	Thermo Scientific	E12-2076	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	Brunswick Innova 44R	Eppendorf	E12-2076	Bacterial/Shaking incubator
Communal	Shaking incubator (variable temp)	Brunswick Innova 44R	Eppendorf	E12-2076	Bacterial/Shaking incubator
Communal	Shaking incubator (non-refrigerated)	Innova 40	Eppendorf	E12-2076	Bacterial/Shaking incubator
Communal	Incubator (37°C)	上海一恒	DHP-9011	E12-2076	Bacterial/Shaking incubator
Communal	UltraCentrifuge	WX 100+	Thermo	E12-2076	Centrifuge
Communal	Superspeed Centrifuge	Avanti J-26XPI	Beckman	E12-2076	Centrifuge
Communal	Gel Imaging System	ChemiDoc™ Touch	Bio-Rad	E12-2076	Gel Doc
Communal	Real-Time PCR	CFX96	Bio-Rad	E12-2076	Real-Time PCR
Communal	Real-Time PCR	CFX96	Bio-Rad	E12-2076	Real-Time PCR
Communal	Nanodrop	8000C	Nanodrop	E12-2076	Spectrometer
Communal	Microplate Reader	VICTOR X5	PerkinElmer	E12-2076	Spectrometer
Communal	Real-Time PCR (384 wells)	QuantStudio 7 Flex	Applied Biosystems	E12-2076	Real-Time PCR
Communal	Electroporation System	Gene Pulser Xcell	Bio-Rad	E12-2076	Electroporation/Transfection
Communal	Dual CO2 Incubator (37°C)	Water Jacketed	Shel Lab	E12-2076a	Bacterial/Shaking incubator
Communal	Dual CO2 Incubator (37°C)	Water Jacketed	Thermo	E12-2076a	Bacterial/Shaking incubator
Communal	BSC	Class II 1300 A2	Thermo	E12-2076a	BSC
Communal	BSC	Class II 1300 A2	Thermo	E12-2076a	BSC
Communal	BSC	Class II 1300 A2	Thermo	E12-2079	BSC
Communal	BSC	Class II 1300 A2	Thermo	E12-2079	BSC



PI	Equipment name	Model	Brand	Location	Category
Communal	Glassware Washer		Steelco	E12-2080	Glassware Washer
Communal	Shaking incubator (37°C)	Brunswick Innova 44R	Eppendorf	N22-3002	Bacterial/Shaking incubator
Communal	Shaking incubator (variable temp)	Brunswick Innova 44R	Eppendorf	N22-3002	Bacterial/Shaking incubator
Communal	Shaking incubator (variable temp)	Brunswick Innova 40R	Eppendorf	N22-3002	Bacterial/Shaking incubator
Communal	Superspeed Centrifuge	Sorvall™ RC 6 Plus	Thermo Scientific	N22-3002	Centrifuge
Communal	UltraCentrifuge	Optima XPN	Beckman Coulter	N22-3002	Centrifuge
Communal	Gel Documentation System	G:BOX Chemi XR5	Sygene	N22-3002	Gel Doc
Communal	Thermal Cycler (96 wells)	T100	Bio-Rad	N22-3002	PCR machine
Communal	Gel Imaging System	ChemiDoc MP	Bio-Rad	N22-3002	Gel Doc
Communal	Real-time PCR (96 wells)	7500 Fast	Applied Biosystem	N22-3010	PCR machine
Communal	Real-Time PCR	ABI 7500	Applied Biosystem	N22-3010	Real-Time PCR
Communal	Fixed 60°C Oven	RI28-2	ShellLab	2 3F Back Corr	Oven
Communal	Sonicator	Bioruptor Plus	Diagenode	N22-2023	Homogenizer/Sonicator
Communal	Bacterial Incubator (37°C)	IB-21E	Jeio Tech	N22-2028	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	Infors	Multitron	N22-2028	Bacterial/Shaking incubator
Communal	Shaking incubator (Variable temperature)	Infors	Multitron	N22-2028	Bacterial/Shaking incubator
Communal	Shaking incubator (37°C)	Innova 40	New Brunswick	N22-2028	Bacterial/Shaking incubator
Communal	Low temperature Incubator	Precision 815	Thermo	N22-2028	Bacterial/Shaking incubator
Communal	ChemiDoc Imaging System	MP	Bio-Rad	N22-2028	Gel Doc
Communal	Sonicator		Thermo	N22-2028	Homogenizer/Sonicator
Communal	Touch Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	N22-2028	PCR machine
Communal	Touch Thermal Cycler (96-Deep Well)	T100	Bio-Rad	N22-2028	PCR machine
Communal	Real-Time PCR (96-Deep Well)	CFX96	Bio-Rad	N22-2028	Real-Time PCR
Communal	Real-Time PCR (96-Deep Well)	7500 Fast	Applied Biosystem	N22-2028	Real-Time PCR
Communal	Microplate Reader	Spark 10M	TECAN	N22-2028	Spectrometer
Communal	UV-Vis Spectrometer	Nanodrop 2000c	Thermo	N22-2028	Spectrometer
Communal	Shaking Incubator (variable temperature)	Innova 40R	Eppendorf	N22-3005	Bacterial/Shaking incubator
Communal	Bioanalyzer System	2100	Agilent	N22-3005	Bioanalyzer
Communal	Fluorescence Stereo Microscope	M165 FC	Leica	N22-3005	Microscope
Communal	Imaging System	ASI	Leica	N22-3010	Microscope
Communal	Shaking Incubator (37°C)	LOM-500D-5	MRC	N22-4009	Bacterial/Shaking incubator
Communal	Bacterial Incubator (37°C)	IB-21E	Jeiotech	N22-4009b	Bacterial/Shaking incubator
Communal	Bacterial Incubator (variable temperature)	IB-21E	Jeiotech	N22-4009b	Bacterial/Shaking incubator
Communal	Fluorescence Inverted microscope	EVOS FL	Life Technologies	N22-4009b	Microscope



PI	Equipment name	Model	Brand	Location	Category
Communal	Fluorescence Upright Microscope	BX53	Olympus	N22-4009b	Microscope
Communal	UV Crosslinker	CL-1000	UVP	N22-4009b	Others
Communal	Thermal Cycler (96 wells)	T100	Bio-Rad	N22-4009b	PCR machine
Communal	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	N22-4009b	PCR machine
Communal	Real-time PCR (96 wells)	7500 Fast	Applied Biosystems	E12-3076	Real-Time PCR
Communal	Fluorescence Inverted microscope	Ti-E	Nikon	N22-4030a	Microscope
Communal	Resonant Scanning Confocal System	A1 R+	Nikon	N22-4030a	Microscope
Communal	Laser MicroDissection + Capillary Cell Sorting System	CellCut + CellEctor	MMI	N22-4030aa	Microscope
Communal	Fluorescence Upright Microscope	DM2500	Lecia	N22-4033	Microscope
Communal	Fluorescence Stereo Microscope	M165FC	Leica	N22-4038	Microscope
Communal	Centrifuge	1580R	Genespeed	N22-3005	Centrifuge
Communal	Molecule Analyzer	Zefasizer Nano ZS	Malvern	N22-3010	Molecule Analyzer
Communal	3-D Refrigerated Tissue Homogenizer	上海淨信	JXCL-3K	N22-3002a	Homogenizer/Sonicator
CXD	Incubator	BD115	Binder	N22-4033	Bacterial/Shaking incubator
CXD	Plasma Cleaner System	IoN 3B	PVA TePla	N22-4022	Others
CXD	Shaking Incubator	MaxQ 4000	Thermo	N22-4033	Bacterial/Shaking incubator
CXD	Sonicator	VCX 750	Sonics	N22-4033	Homogenizer/Sonicator
CXD	Thermal Cycler (96 deep wells)	C1000	Bio-Rad	N22-4033	PCR machine
CXD	Thermal Cycler (96 wells)	Nexus Pro S	Eppendorf	N22-4033	PCR machine
CXD	Fluorescence Microscope	SMZ 800	Nikon	N22-4035	Microscope
CXD	Fluorescence Microscope	Ci	Nikon	N22-4035	Microscope
CXD	Inverted fluorescence microscope	EVOS® FL	Life Technologies	N22-4035	Microscope
CXD	Live Cell Imaging System	Biostation IM-Q	Nikon	N22-4035	Microscope
CXD	CTC/ctDNA Isolation Equipment	LiquidBiopsy® Platform	LiquidBiopsy	N22-4035	Others
CXD	Nano Pump and Autosampler	Dionex Ultimate 3000	Thermo	N22-4035	Others
CXD	Real-time PCR (96/384 wells)	QuantStudio 7 Flex	Life Technologies	N22-4035	Real-Time PCR
CXD	nCounter Analysis System	FLEX	NanoString	N22-4035a	Others
EC	Weighing Balance	MS205DU	Mettler Toledo	N22-4002	Balance
EC	Inverted microscope	EVOS® XL	Life Technologies	N22-4002	Microscope
EC	Thermal Cycler (dual 96/96 wells)	GS2	G-Storm	N22-4002	PCR machine
EC	Shaking Incubator	MaxQ 6000R	Thermo	N22-4002	Bacterial/Shaking incubator
EC	Ultrasonicator	Bioruptor®	Diagenode	N22-4023	Homogenizer/Sonicator
GGW&HJZ	Touch Thermal Cycler (dual 48/48-well)	C1000	Bio-Rad	E12-3069	PCR machine
GGW&HJZ	pH meter	S220-Kit	Mettler Toledo	E12-3069	pH meter



PI	Equipment name	Model	Brand	Location	Category
GGW&HJZ	Benchtop UV transilluminator	LMS-26	UVP	E12-3069	UV transilluminator
GKC	ChemiDoc Imaging System	MP	Bio-Rad	N22-2008	Gel Doc
GKC	Benchtop Orbital Shakers	MaxQ 4000	Thermo	N22-2008	Bacterial/Shaking incubator
GKC	Gradient Master & Fractionator	#108	Biocomp	N22-2008	Gradient Fractionator
GKC	Electroporation System	Gene Pulser Xcel	Bio-Rad	N22-2008	Electroporation/Transfection
GKC	Cytocentrifuge	7621	Wescor	N22-2008	Immunohistochemistry
GKC	UV-Vis Spectrometer	Nanodrop 2000c	Thermo	N22-2008	Spectrometer
GKC	Inverted Microscope	CKX41	Olympus	N22-2017	Microscope
GL	Sonicator	Q700	Qsonica	N22-2032	Homogenizer/Sonicator
GL	Cell imager	CL1000	Invitrogen	N22-2032	Microscope
GL	Gel Air Drying System	165-1772	Bio-Rad	N22-2032	Others
GL	Thermal Cycler (96-Deep Well)	SimpliAmp	Thermo	N22-2032a	PCR machine
GL	Touch Thermal Cycler (96-Deep Well)	T100	Bio-Rad	N22-2032a	PCR machine
GL	Live cell Microscope	DMi8	Leica	N22-2028aa	Microscope
HFK	QPCR Systems	MX3005P	Agilent	N22-3005	Real-Time PCR
HFK	Live cell imaging system	EVOS M7000	Life Technologies	E12-2068	Imaging system
JSS	Microbiological Incubator	Heratherm	Thermo	N22-2029	Bacterial/Shaking incubator
JSS	ChemiDoc Imaging System	MP	Bio-Rad	N22-2029	Gel Doc
JSS	Sonicator (1/8 inch probe)	Model 120	Fisher Scientific	N22-2029	Homogenizer/Sonicator
JSS	96 Manual Pipetting System	Liquidator	Mettler Toledo	N22-2029	Liquid handler
Faculty	Shaking incubator with Refrigeration	Innova 42R	Eppendorf	E12-2073	Bacterial/Shaking incubator
Faculty	ChemiDoc	ChemiDoc™ Touch	Bio-Rad	E12-2073	Gel Doc
Faculty	Sonicator	VCX800	Sonics	E12-2073	Homogenizer/Sonicator
KHW	Refrigerated incubation shaker	Multitron Standard	INFORS HT	E12-2075	Bacterial/Shaking incubator
KHW	Sonicator	Q800R3-220	Qsonica	E12-2075	Homogenizer/Sonicator
KHW	Cascade Benchtop Freeze Dry System	FreeZone Plus 4.5 Liter	Labconco	E12-2075	Others
KHW	Incubating shaker for fungus	MaxQ	Thermo Scientific	E12-2075	Shaking incubator
KHW	NucleoCounter	NC-200	Chemometec	E12-2076	Cell Counter
KHW	Growth chamber with lights and refrigeration	I-41VL	Percival Scientific	E12-2076	Bacterial/Shaking incubator
KHW	Anaerobic Process Chamber	BACTRON300	Backtron	E12-2076	Others
KHW	Sample Processor	MixerMill MM400	Retsch	E12-2076	Others
KHW	Bullet Blender Homogenizer	BB50-DX	Next Advance	E12-2076	Homogenizer/Sonicator
KHW	Biolistic Particle Delivery System	PDS-1000/He Hepta System	Bio-Rad	E12-2076	Others
KHW	Microbiological Incubators	Heratherm	Thermo Scientific	E12-2079	Bacterial/Shaking incubator



PI	Equipment name	Model	Brand	Location	Category
KHW	Spectrophotomer	BioMate3S	Thermo Scientific	E12-2079	Spectrometer
KHW	Shaking incubator	MaxQ	Thermo Scientific	E12-2079	Bacterial/Shaking incubator
KHW	CO2 incubator	150i	Thermo Scientific	E12-2079	Incubator
KHW	Oven	ON-21E	Lab Companion	E12-2080	Oven
KHW	Sonicator	Q800R	Qsonica	E12-3081	Homogenizer/Sonicator
KHW	Homogenizer	FastPrep-96	MPBio	E12-3081	Homogenizer/Sonicator
KHW	Growth chamber with lights and refrigeration	I-41VL	Percival Scientific	N22-3/F corridor	Bacterial/Shaking incubator
KQL	Gel Imaging System	ChemiDoc™ MP	Bio-Rad	N22-4038	Gel Doc
KQL	Ultrasonicator	Bioruptor® Plus	Diagenode, USA	N22-4038	Homogenizer/Sonicator
KQL	Microscopy Camera	Axiocam 512 color (D)	ZEISS	N22-4038	Microscope
KQL	Low Pressure Syringe Pump	neMESYS	Cetoni GmbH	N22-4038	Others
KQL	Thermal Cycler (dual 48/48 wells)	C1000	Bio-Rad	N22-4038	PCR machine
KQL	UV-VIS Spectrophotometer	BioMate™ 3S	Thermo	N22-4038	Spectrometer
KQL	Real-time PCR Machine	CFX96	Bio-Rad	N22-4038	PCR Machine
KT	Concentrator	Savant SpeedVac SPD1010-P1	Thermo	N22-2002	Concentrator
KT	Freedom pipetting robot (fixed tips)	Evo 750	Tecan	N22-2002	Others
KT	Predicting Permeability System	Pampa	Pion	N22-2002	Others
KT	Low Temp Bath with Stirring (Organic reactions cooler)	PSL-1810	Eyela	N22-2002	Others
KT	UV-Vis Spectrometer	Lambda 35	PerkinElmer	N22-2002	Spectrometer
KT	Fluorescence Spectrometer	LS 55	PerkinElmer	N22-2002	Spectrometer
KT	Fourier Transform Infrared (FT-IR)	Nicolet iS5	Thermo	N22-2002	Spectrometer
KT	Lipex Extruder with Nitrogen Regulator	10mL Lipex Extruder	Lipex	N22-2002a	Others
LJD	Cytocentrifuge	CytoSpin™ 4	Thermo	N22-4009	Centrifuge
LJD	Gel Imaging System	PXi	Syngene	N22-4009	Gel Doc
LJD	Ultrasonicator	Q700-220	Qsonica	N22-4009	Homogenizer/Sonicator
LJD	Nanodrop	One	Nanodrop	N22-4009	Spectrometer
LJD	Plate Reader	SpectraMax M5e	Molecular Devices	N22-4009	Spectrometer
LL	High-throughput GPCR Signaling Platform	Envision	PerkinElmer	E12-2068	Others
QZ	Pure Protein Purification system	AKTA Pure	GE Healthcare	E12-2069	Chromatography
QZ	Flow cytometer	CytoFlex	Beckman	E12-2069	Flow cytometer
QZ	Standard Multi-Mode Microplate	SpectraMax iD5	Molecular Devices	E12-2069	Spectrometer
QZ	Electroporation System	Gene Pulser Xcel	Bio-Rad	E12-2079	Electroporation/Transfection
RHXu	Microbiological Incubator	Heratherm	Thermo	N22-2004	Bacterial/Shaking incubator
RHXu	Microbiological Incubator	IGS60	Thermo	N22-2004	Bacterial/Shaking incubator



PI	Equipment name	Model	Brand	Location	Category
RHXu	Benchtop Orbital Shakers	MaxQ 4000	Thermo	N22-2004	Bacterial/Shaking incubator
RHXu	Flow Cytometer	CytoFlex	Beckman	N22-2004	Flow Cytometer
RHXu	Sonicator	Misonix 3000	Thermo	N22-2004	Homogenizer/Sonicator
RHXu	Image Cytometer	Celigo	Nexcelom	N22-2004	Image Cytometer
RHXu	IncuCyte	ZOOM HD/2CLR	Essen BioScience	N22-2004	Live Cell Analysis System
RHXu	Lab Oven	CE3G	Shel Lab	N22-2004	Oven
RHXu	Real-Time PCR (96-Deep Well)	CFX96	Bio-Rad	N22-2004	Real-Time PCR
RHXu	UV-Vis Spectrometer	BioPhotometer Plus	Eppendorf	N22-2004	Spectrometer
RHXu	Sonicator	705	Thermo	N22-2028	Homogenizer/Sonicator
RYX	Semi-Preparative High Performance Liquid	1260	Agilent	N22-2002	Chromatography
RYX	Cryostat	CM3050S	Leica	E12-2071	Immunohistochemistry
RYX	Manual Microtome	RM 2235	Leica	E12-2071	Immunohistochemistry
RYX	Auto Fluorescence Inverted Microscope Imaging System	EVOS FL	Thermo	E12-2071	Microscope
RYX	Touch Thermal Cycler (96-Deep Well)	C1000	Bio-Rad	E12-2071	PCR machine
Teaching	Nanodrop	One C	Nanodrop	E12-3076	Spectrometer
TP	Automating Micro-plate Liquid Handling and Washing	Freedom EVO100	Tecan	E12-2076	Microplate Washer
TP	Multiple Dispenser	Te-Fill	Tecan	E12-2076	Others
WG	Benchtop Incubator Shakers	Innova 40	Eppendorf	N22-2035	Bacterial/Shaking incubator
WG	NCG Chromatography	Quest 100	Bio-Rad	N22-2035	Chromatography
WG	Freeze Dry System	FreeZone Plus	Labconco	N22-2035	Concentrator
WG	Electroporation System	Gene Pulser Xcel	Bio-Rad	N22-2035	Electroporation/Transfection
WG	ChemiDoc Imaging System	MP	Bio-Rad	N22-2035	Gel Doc
WG	Microplate Reader	Infinite M200 pro	Tecan	N22-2035	Spectrometer
WKC	Live Cell Imaging Microscope	HT-2H	Tomocube	E12-3068	Microscope
WKC	Fluorescent Inverted Microscope with Live Cell	Nikon/LCI	Ti2-E / TU-C-20	E12-3068	Microscope
WLC	Superspeed Centrifuge	LYNX 6000	Thermo	N22-4004	Centrifuge
WLC	Chromatography System	AKTA Pure 25	GE Life Sciences	N22-4004	Chromatography
WLC	Gel Imaging System	ODYSSEY® CLx	Li-Cor	N22-4004	Gel Doc
WLC	Antigen Retrifer	62700-10	Electron Microscopy	N22-4004	Others
WLC	Contiuous Flow Cell Disruptor	JN-Mini	JNBIO	N22-4004	Others
WLC	Thermal Cycler (96 wells)	2720	Applied Biosystems	N22-4004	PCR machine
WLC	NanoDrop	ND-2000	NanoDrop	N22-4004	Spectrometer
XLX	FACS Aria III ACDU Field Upgrade	643155	BD Biosciences	N22-3045	Flow Cytometer
XLX	Shaking Incubator	Innova 42R	New Brunswick	N22-4005	Bacterial/Shaking incubator



PI	Equipment name	Model	Brand	Location	Category
XLX	Concentrator (1.5/2.0ml)	Concentrator Plus	Eppendorf	N22-4005	Concentrator
XLX	Gel Imaging System	ChemiDoc Touch	Bio-Rad	N22-4005	Gel Doc
XLX	Tissue Homogenizer	Precellys 24	Bertin Instruments	N22-4005	Homogenizer/Sonicator
XLX	Fluorescence Stereo Microscope	M165FC	Leica	N22-4005	Microscope
XLX	Fluorescence Upright Microscope	Ci-S	Nikon	N22-4005	Microscope



Appendix 6A

Additional Rules and Warning/ Penalty System of the Animal Research Core (ARC)

1 Purposes

- 1.1 To complement *Guidelines that Govern the Use and Management of Equipment in FHS* (FHS_Guideline_029) and specify additional rules related to the usage of the ARC equipment.
- 1.2 To discourage misconducts in ARC.
- 1.3 To define the activities that are considered violations in ARC and their corresponding penalties upon commission.

2 Definition and Classification of Violations

2.1 Minor Violations

- 2.1.1 Did NOT put on the personal protective equipment (PPE) properly as required.
- 2.1.2 Did NOT shut the corridor door properly (N22-03-C09, N22-03-C16, N22-3035, N22-3048, N22-3050, N22-3051 to 3062, N22-4029, E12-2802).
- 2.1.3 Did NOT enter the ARC with the personal access card of the ARC user.
- 2.1.4 Did NOT sanitize and disinfect experimental materials according to the rules or SOPs of ARC.
- 2.1.5 Took any ARC items away without permission, and these items include cages, tanks, gloves, shoe covers, masks, caps, etc.
- 2.1.6 Did NOT label the lab animals and the housing cages or tanks with the required information.



- 2.1.7 Enter other animal holding rooms in which the ARC user does NOT have any lab animals.
- 2.1.8 Entered aquatics room (N22-3048 or N22-3050) during the dark cycle (10:00p.m. to 08:00a.m.).
- 2.1.9 Improperly used the equipment, including a use without proper training, no log on the logbook, no clean up after use.
- 2.1.10 Opened the cages on the floor.
- 2.1.11 Violated the workflow described in SOPs of ARC.
- 2.1.12 Did NOT clean up experimental area after use.
- 2.1.13 Did NOT correct the issue of an overcrowded cage after the proper notification has been delivered for two working days. The definitions of an overcrowded cage and high housing density are:
 - a) More than two rats per rat cage, and each rat weighs more than 200g;
 - b) More than four rats per rat cage, and each rat weighs less than 200g;
 - c) More than one rat with a weight more than 200 g and three rats with weights less than 200g each per rat cage;
 - d) More than six adult mice in the cage of mice;
 - e) More than one male and two female mice in the breeding cage; or
 - f) More than one litter of offspring over ten days old.
- 2.1.14 Did NOT correct the issue of an overcrowded tank after the proper notification has been delivered for two working days. The definitions of an overcrowded tank and high housing density of adult fish (more than 90 days per fertilization) and juvenile fish (less than 90 days per fertilization) are:
 - a) More than 10 adult fish in a 1.1L tank;
 - b) More than 30 adult fish in a 3.5L tank;
 - c) More than 70 adult fish in an 8.0L tank



- d) More than 45 juvenile fish in a 3.5L tank;
- e) More than 100 juvenile fish in an 8.0L tank.

2.2 Intermediate Violations

- 2.2.1 Did NOT handle the waste according to the rules or SOPs of ARC.
- 2.2.2 Performed lab animal experiments in areas that are NOT classified as designated areas.
- 2.2.3 Left lab animals unattended outside the animal holding room.
- 2.2.4 Used the Satellite Animal Facilities (SAFs) of ARC without authorization.
- 2.2.5 Left lab animals in N22-3035 or other wet labs overnight.
- 2.2.6 Violated the Animal Welfare Principles, including but NOT limited to unnecessary injury to lab animals, excessive use of lab animals and unreasonable handling of lab animals.

2.3 Major Violations

2.3.1 Category A:

- 2.3.1.1 Did NOT keep lab animals properly to prevent them from escaping during the experiment.
- 2.3.1.2 Did NOT decontaminate and disinfect items (including living animals and carcasses) in N22-4029 and N22-4029a of SAFs before removing from the room.
- 2.3.1.3 Did NOT handle lab animal carcasses, embryos or pathological waste according to the rules or SOPs of ARC.

2.3.2 Category B:

- 2.3.2.1 Performed animal manipulations that are NOT described in the approved Animal Research Ethics Application.
- 2.3.2.2 Performed other lab animal experiments in other facility simultaneously.



2.3.3 Category C:

2.3.3.1 Brought any animals in the barrier of ARC without permission.

2.3.3.2 Performed infectious experiments in labs other than N22-4029 and N22-4029a of SAFs without safety assessment and permission.

2.3.4 Category D:

2.3.4.1 Caused other severe incidents and/or accidents such as causing zoonosis

2.3.4.2 Treated lab animals cruelly or violently.

3 Penalty Scheme

- 3.1 An ARC user who has received a warning for an intermediate violation or warnings for three minor violations in a year is requested to suspend the right to use lab animals and to access ARC for one week as the penalty.
- 3.2 An ARC user who has received a warning for a major violation in Category A or warnings that are equivalent to three intermediate violations is requested to suspend the right to use lab animals and to access ARC for two months as the penalty.
- 3.3 An ARC user who has received a warning for a major violation in Category B, Category C or Category D, this user is requested to suspend the right to use lab animals and to access ARC for six months, one year or permanently respectively as the penalty. In addition, after the suspension period, this ARC user is required to submit a review report and re-do the training before the right to use lab animals and to access ARC is re-granted.



Appendix 6B

Additional Rules and Warning/ Penalty System of the Biological Imaging and Stem Cell (BISC) Core

1. Purposes

- 1.1 To complement *Guidelines that Govern the Use and Management of Equipment in FHS* (FHS_Guideline_029) and specify additional rules related to the usage of the BISC Core equipment.
- 1.2 To define the violations and penalties related to the usage of the BISC Core equipment.

2. Additional Rules

- 2.1 Special rules that govern the use of immersion oil on microscopes

A user who plans to use oil lenses during a microscope session shall:

- 2.1.1 Go to N22-3011 or E12-3078 to check out an immersion oil bottle that matches the microscope from the BISC Core member before his/her imaging session.
- 2.1.2 Thoroughly clean up the immersion oil from all lenses after use.
- 2.1.3 Return the oil bottle to N22-3011 / E12-3078 after use and sign the log sheet in addition to signing the log sheet in the microscope rooms.
- 2.1.4 **NEVER** use any immersion oil that does NOT belong to the BISC Core on any BISC Core microscopes.
- 2.1.5 **NEVER** keep any BISC Core immersion oil bottle in his/her possession for longer than 24 hours without approval from the BISC Core.
- 2.2 Contamination prevention



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- 2.2.1 Any imaging / processing of cells or materials with potential for contamination or infection (e.g. live primary cells, cells containing pathogenic viruses, etc.) in the BISC Core equipment rooms must be pre-approved.
- 2.2.2 Any cell culture brought into the stem cell culture rooms of BISC Core must have gone through required tests and be pre-approved.
- 2.2.3 Bacterial or fungal samples should NOT be processed on equipment dedicated to mammalian cells.
- 2.2.4 A user shall contact the BISC Core for the pre-approval.
- 2.3 Special training requirements for dangerous or delicate instruments

Some specific instruments will be classified as dangerous or delicate instruments. To ensure safety and avoid injury or damage, users who have not used one of these instruments for a period of time (3-6 months depending on the risk level) will be required to go through refresher training before returning to operation. Booking access will be suspended for users with long idle periods until the training is done.

To use instruments classified as dangerous or delicate instruments, a user shall

 - 2.3.1 Pay close attention to warnings and notices posted on or near the instrument;
 - 2.3.2 Never operate the machine when not in good physical or mental condition;
 - 2.3.3 Seek help from BISC Core staff if not confident with the operation;
 - 2.3.4 Contact BISC Core staff for refresher training when required.

3. Definition and Classifications of Violations

3.1 Minor Violations

- 3.1.1 Used a BISC Core equipment without reservation unless the equipment is categorized as “*No reservation required*” or occupied a time slot outside of the reserved period.



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- 3.1.2 Booked an equipment for others.
- 3.1.3 Used the identity of another user to use an equipment or access BISC Core laboratory.
- 3.1.4 Booked an equipment without actually using it.
- 3.1.5 Ate or drank in the BISC Core equipment rooms.
- 3.1.6 Did NOT sign the logbook after use.
- 3.1.7 Did NOT clean up the experimental area after use.
- 3.1.8 Used unapproved means to copy data.
- 3.2 Intermediate Violations
 - 3.2.1 Used the BISC Core equipment without training and authorization.
 - 3.2.2 Brought unauthorized person to use the BISC Core equipment.
 - 3.2.3 Did NOT follow the standard procedures in using the equipment, including but NOT limited to starting up the equipment according to instructions, filtering samples when required, running cleaning cycles as required, turning off the equipment according to instructions, discarding waste, refilling reagents, and cleaning up immersion oil from lenses.
 - 3.2.4 Did NOT report to the person-in-charge when a problem was identified before or during operation.
 - 3.2.5 Took away any BISC Core item without permission.
 - 3.2.6 Used equipment computers for some purposes NOT related to the intended use of the equipment.
- 3.3 Major Violations
 - 3.3.1 Handled unapproved contaminating / infectious materials in BISC Core.



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- 3.3.2 Did NOT follow the standard procedures in using the equipment, leading to damage or injuries.
- 3.3.3 Intentionally damaged the BISC Core equipment or other user's experimental materials or data.

4. Penalty Scheme

- 4.1 For a BISC Core user with one minor violation, no additional penalties will be imposed other than the warning letter.
- 4.2 For a BISC Core user who has received a warning for an intermediate violation or warnings for three minor violations in a year, the right to use any BISC Core equipment will be suspended for two weeks.
- 4.3 For a BISC Core user who has received a warning for a major violation or warnings that are equivalent to two intermediate violations:
 - 4.3.1 The right to use any BISC Core equipment will be suspended for 1 to 6 months, depending on the nature and consequence of violations.
 - 4.3.2 This user is required to submit a review report in hard copy with the endorsements by his/her supervisor and the OM of the BISC Core within 14 days from the warning letter issuance.
 - 4.3.3 After the suspension period, this user is required to go through the training again before the right to use BISC Core instruments is re-granted.



Appendix 6C

Additional Rules and Warning/ Penalty System of the Genomics, Bioinformatics & Single Cell Analysis (GBSC) Core

1. Purposes

- 1.1 To complement the *Guidelines that Govern the Use and Management of Equipment in FHS* (FHS_Guideline_029) and specify additional rules related to the usage of the GBSC Core equipment.
- 1.2 To discourage any misconduct in the GBSC Core.
- 1.3 To define the activities that are considered violations in the GBSC Core and their corresponding penalties upon commission.

2. Definition and Classifications of Violations

2.1 Minor Violations

- 2.1.1 Used a GBSC Core equipment without reservation (unless the equipment is listed as “No reservation required”). Reservation must be done according to the instructions by GBSC Core, e.g. GBSC core webpage).
- 2.1.2 Booked any GBSC Core equipment for others.
- 2.1.3 Booked any GBSC Core equipment without actually using it.
- 2.1.4 Ate or drank in the GBSC Core.
- 2.1.5 Did NOT clean up the experimental area after use.
- 2.1.6 Did NOT sign the logbook before or after each use.
- 2.1.7 Did NOT follow standard procedures in using the equipment, leading to damage to a minor part of the equipment, e.g. parts that can be easily replaced. The actions include but are NOT limited to NOT starting up the equipment according to instructions, filtering samples when required, turning off the



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equipment according to instructions, discarding waste and other experimental materials, refilling reagents, and cleaning up the equipment.

2.1.8 Used unapproved means to copy data, e.g. did NOT use virus free thumb-drive at the computers of the GBSC Core.

2.1.9 Used computers linked to the equipment for purposes unrelated to the intended use of the equipment.

2.2 Intermediate Violations

2.2.1 Used GBSC Core equipment without training or approval.

2.2.2 Brought unauthorized persons to use a GBSC Core equipment.

2.2.3 Handled or stored unapproved samples like contaminating/ infectious materials, in GBSC Core.

2.2.4 Did NOT follow standard procedures in using the equipment that leads to minor damage to the equipment.

2.2.5 Did NOT follow standard procedures in using equipment that indirectly affects experiments or materials of another user or GBSC Core.

2.3 Major Violations

2.3.1 Did NOT follow standard procedures in using the equipment that leads to adverse damage to the equipment or injuries.

2.3.2 Intentionally damaged a GBSC Core equipment or its resource.

2.3.3 Intentionally tampered experimental material or data that belongs to another user or the GBSC Core.

3. Penalty Scheme

3.1 For a GBSC Core user with a minor violation, no additional penalties will be imposed other than the warning letter.



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- 3.2 For a GBSC Core user with two or more minor violations on the same equipment, GBSC Core has the right to suspend the use of any GBSC Core equipment for some time or request the user for re-training depending on the nature and consequence of violations.
- 3.3 For a GBSC Core user who has committed an intermediate violation or accumulated three minor violations and beyond:
 - 3.3.1 Suspend the right to use any GBSC core instrument for a period, depending on the nature and consequence of violations.
 - 3.3.2 After the suspension period, this user is required to go through the training again before the right to use GBSC instruments is re-granted.
- 3.4 For a GBSC Core user who has received a warning for a major violation or warnings that are equivalent to two intermediate violations:
 - 3.4.1 Suspend the right to use any GBSC core equipment immediately.
 - 3.4.2 The GBSC Core user is required to submit an incident report with the endorsement by his/her supervisor to the OM of the GBSC Core within 14 days from the warning letter issued.
 - 3.4.3 The resumption of usage of the GBSC Core equipment will be dependent on the decision of the GBSC Core OM, the Core Advisory Committee, Associate Dean (Research) and/or Dean.



Appendix 6D

Additional Rules and Warning/ Penalty System of the Proteomics, Metabolomics and Drug Development (PMDD) Core

1. Purposes

- 1.1 To complement the *Guidelines that Govern the Use and Management of Equipment in FHS* (FHS_Guideline_029) and specify additional rules related to the usage of the PMDD Core equipment.
- 1.2 To define the violations and penalties related to the usage of the PMDD Core equipment.

2. Rules that Govern the Operation of Equipment

2.1 Training

A new user who wishes to operate a PMDD equipment by his/herself shall:

- 2.1.1 Apply for training by email at least two weeks ahead of time.
- 2.1.2 Apply for training of an equipment only when he/she has concrete plans to use it within three months. The access to the equipment will be revoked three months from the training date if the user did NOT start to use it.
- 2.1.3 Use the equipment under the supervision of the person in-charge for 1 to 3 sessions, depending on the specific equipment, and pass the evaluation by the person in-charge during the supervised session.
- 2.1.4 Apply for **his/her own** room access and booking account rather than applying for an account for others after passing the evaluation.
- 2.1.5 Apply for repeating the training session and supervised usage session if the user has NOT used the equipment for more 6 months since last training or usage.



2.2 Access to the Equipment

A user who wishes to operate a PMDD equipment by his/herself shall:

- 2.2.1 Receive official training from the PMDD Core before using any PMDD Core equipment.
- 2.2.2 Submit a completed request form with the PI signature to the corresponding Core RA to get approval from the Core OM of PMDD Core.
- 2.2.3 Make reservations in advance every time he/she uses an equipment.
- 2.2.4 Always use his/her own UM Campus Card to enter the PMDD Core equipment rooms.
- 2.2.5 Always use his/her own account for equipment booking.
- 2.2.6 Cancel the booking before the start time if there is a change of plan.
- 2.2.7 NEVER book a PMDD Core equipment for other people.
- 2.2.8 NEVER take any unauthorized person into the PMDD Core equipment room without permission.

2.3 Operation

A user who wishes to operate a PMDD equipment by his/herself shall:

- 2.3.1 Prepare samples following specific requirements of the equipment.
- 2.3.2 Always inspect the equipment for damage / abnormalities before use. If anything unusual is noticed, do NOT use the equipment and contact PMDD Core immediately for further instructions. The equipment is assumed to be in normal condition at this point if no report of malfunction or abnormalities is received.
- 2.3.3 Follow the standard procedures to use the equipment as learnt in the training session.
- 2.3.4 Label your samples, reagents, chemicals, and plastic and glasswares clearly, including user name, sample name and the date.



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- 2.3.5 Follow the specific requirements to clean up / refill reagents / run cleaning cycles / empty waste / turn off the machine or computer if required after the experiment is finished.
- 2.3.6 Refer to SOP of the equipment. For the request beyond the established SOP, seek advice from the PMDD Core Scientific Consultants or relevant professors.
- 2.3.7 Sign up on the log sheet with using time, date, and equipment status before and after each use.
- 2.3.8 Save the results in a virus-free storage device or copy the results from the computer in time. The data will be discarded regularly due to the limited storage space.
- 2.3.9 Do NOT take away reagents/equipment of the core without notifying PMDD Core.

3. Rules that govern usage for PMDD Core equipment for non-self-users

A user who wishes to use a PMDD equipment with the help of the Core member shall:

- 3.1 Submit a completed request form with the PI signature to the PMDD Core to get approval from the OM of PMDD Core.
- 3.2 Receive a scheduled reservation about the request.
- 3.3 Prepare and store the samples following specific requirements of each equipment.
- 3.4 Submit the samples to PMDD Core for further processes according to the schedule.
- 3.5 Inform PMDD Core to cancel the reservation before the start time if there is a change of experiment plan.
- 3.6 Talk to a Core member with the detailed purpose before the experiment and the detailed problems shortly after experiment if there is any issue or problem with the readouts and our service. Otherwise, it will be considered that you have no complaints about our service.



- 3.7 Be prepared that there may be a chance for a long line-up for the equipment or service owing to the demand and the long experiment duration. The Core will inform the estimated delivery time for a better experimental planning or for considering outsourcing the request as an alternative.

4. Definition and Classification of Violations

4.1 Minor Violations

- 4.1.1 Used the PMDD Core equipment without reservation (unless the equipment is listed as “*No reservation required*”).
- 4.1.2 Booked an equipment for others.
- 4.1.3 Booked an equipment without actually using it.
- 4.1.4 Ate or drank in the PMDD Core equipment rooms.
- 4.1.5 Did NOT clean up the experimental area after use.
- 4.1.6 Did NOT signing the logbook after use.
- 4.1.7 Did NOT follow rules, SOPs and specific requirement in using the equipment without leading to damage.
- 4.1.8 Used the equipment computers for purposes NOT related to the intended use of the equipment.

4.2 Intermediate Violations

- 4.2.1 Used the PMDD Core equipment without training and authorization.
- 4.2.2 Brought unauthorized person to use the PMDD Core equipment.
- 4.2.3 Did NOT follow the standard procedures in using the equipment, leading to damage or injuries.
- 4.2.4 Did NOT report to person-in-charge when a problem was identified before or during operation.

4.3 Major Violations



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- 4.3.1 Handled unapproved contaminating / infectious materials in PMDD Core.
- 4.3.2 Did NOT follow standard procedures when using the equipment, leading to damage or injuries.
- 4.3.3 Intentionally damaged the PMDD Core equipment or other user's experimental materials or data.

5. Penalty Scheme

- 5.1 For a PMDD Core user with one minor violation, no additional penalties will be imposed other than the warning letter.
- 5.2 For a PMDD Core user with one intermediate violation or three minor violations within a six-month period, the right to use any PMDD Core equipment will be suspended for a week.
- 5.3 For a PMDD Core user who has received a warning for a major violation or warnings that are equivalent to two intermediate violations:
 - 5.3.1 The right to use any PMDD Core equipment will be suspended for 1 to 6 months, depending on the nature and consequence of violations.
 - 5.3.2 This user is required to submit a review report in hard copy with the endorsements of his/her supervisor and the PMDD Core OM within 14 days from the warning letter issuance.
 - 5.3.3 After the suspension period, this user is required to go through the training again before the right to use PMDD Core equipment is re-granted.



Appendix 6E

Additional Rules and Warning/ Penalty System of the FHS Communal Equipment

1. Purposes

- 1.1 To complement *Guidelines that Govern the Use and Management of Equipment in FHS* (FHS_Guideline_029) and specify additional rules related to the usage of the FHS communal equipment.
- 1.2 To define the violations and penalties related to the usage of Communal Equipment of FHS.

2. Definition and Classification of Violations

2.1 Minor Violations

- 2.1.1 Ate in labs.
- 2.1.2 Did NOT clean up the experimental area after use.
- 2.1.3 Did NOT clean up the used equipment after use.
- 2.1.4 Did NOT label properly container/material.
- 2.1.5 Did NOT log on the logbook before and/or after use.
- 2.1.6 Did NOT put on the personal protective equipment (PPE) properly as instructed.
- 2.1.7 Did NOT reserve equipment prior to usage.
- 2.1.8 Did NOT switch off the equipment when required after use.
- 2.1.9 Discarded waste in the incorrect waste bins.
- 2.1.10 Held open the door intentionally for prolonged period of time.



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2.1.11 Occupied the reserved timeslot of other users.

2.1.12 Placed items in the hallway that block passage.

2.1.13 Used computers that belong to the Faculty for non-academic use.

2.2 Intermediate Violations

2.2.1 Did NOT inform the “Person in-charge” ahead of time when bringing a non-FHS user to use a FHS equipment.

2.2.2 Did NOT report to person-in-charge when problem is found during operation.

2.2.3 Did NOT report work incident and/or accident in a timely manner.

2.2.4 Entered a lab area without authorization.

2.2.5 Failed to operate the experiment and/or equipment as instructed.

2.2.6 Smoked in labs.

2.2.7 Used equipment without proper authorization and/or training.

2.2.8 Used personal USB to retrieve data when internet access is available on that equipment.

2.3 Major Violations

2.3.1 Borrowed identity of another user to use an equipment or access a lab area.

2.3.2 Caused severe incidents and/or accidents due to own irresponsibility.

2.3.3 Conducted experiment in an unauthorized area and/or with an equipment without prior permission.

2.3.4 Disturbed experiment of another user.

2.3.5 Failed to operate the experiment and/or equipment as instructed and led to severe equipment damage.

2.3.6 Ignored signs and notices posted by the Faculty or Person in-charge.



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- 2.3.7 Lent an equipment (or any accessory) to a non-FHS member without reporting to the “Person in-charge” or collecting proper permission in advance.
- 2.3.8 Lent the campus card and/or identity to another user for unauthorized entry to lab areas or unauthorized access of equipment.
- 2.3.9 Took away an item that does NOT belong to the user without permission, including the equipment, accessories of equipment and computers, etc.
- 2.3.10 Took out other’s cryopreserved item (e.g., antibodies, proteins, RNA, cells or tissues) from an equipment without returning it to the equipment on time and caused thawing, malfunctions or death of the item.

3. Penalty Scheme

- 3.1 For a communal equipment user with one minor violation, no additional penalties will be imposed other than the warning letter.
- 3.2 For a communal equipment user who has received a warning for an intermediate violation or warnings for three minor violations in a year, the right to use any communal equipment will be suspended for two weeks.
- 3.3 For a communal equipment user who has received a warning for a major violation or warnings that are equivalent to two intermediate violations:
 - 3.3.1 The right to use any communal equipment will be suspended for 1 to 6 months, depending on the nature and consequence of violations.
 - 3.3.2 After the suspension period, this user is required to go through the training again before the right to use communal equipment is re-granted.