2 **Brief Development**

2.7 Benchmarking Projects 2.7.4 Wet Laboratory vs Write Up

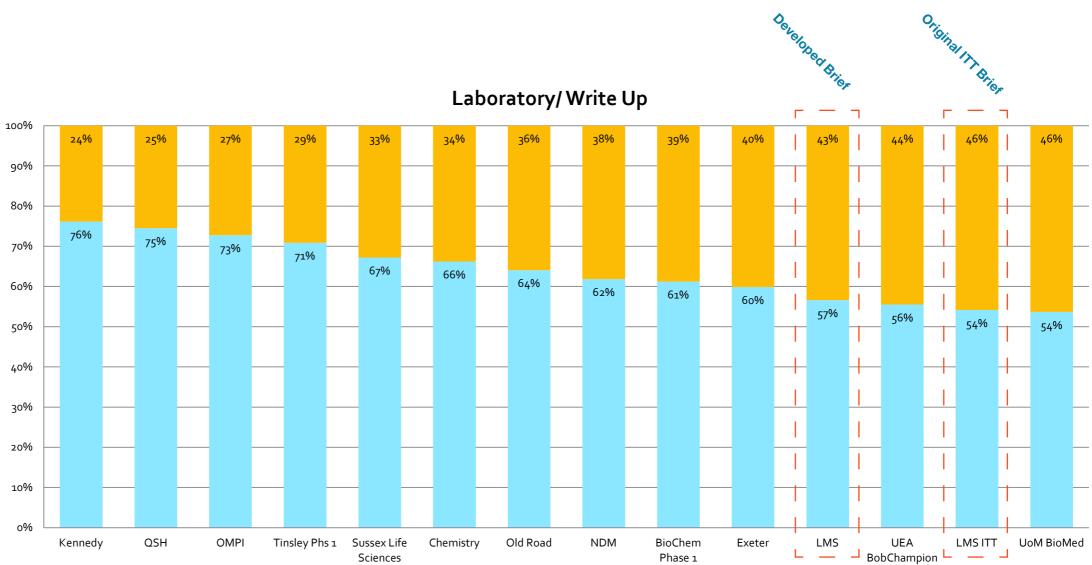
Wet Laboratory vs Write Up Commentary:

The graph opposite benchmarks the LMS brief against similar projects with regard to the overall ratio between primary laboratory and write up space.

The current brief has 57% laboratory vs 43% write-up which sits slightly below the average across the projects which it has been benchmarked against however the LMS Institute hopes to include a few dry laboratory research groups which will affect the overall percentage.

Recommendations:

This ratio will be considered further in the coming brief development to ensure that the correct balance is achieved for the LMS now as well as for the furture. This ratio will also be considered in the potential adaptability of the building as the design develops.



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2 Brief Development

2.8 User Consultations

2.8 Lessons Learned

The User Consultation Process:

Hawkins Brown, Abell Nepp and BuroHappold held User briefing sessions with key Group Leaders in the summer to further refine the original 2016 brief.

The Design Team issued questionnaires to the researchers to gather important high-level information regarding their needs, priorities and requirements for the new facility, such as primary research space, shared services and equipment, and key environmental criteria. Other issues such as the use of social and amenity spaces and transport modes were captured.

Information was gathered from group meetings and individual responses to the questionnaires. The data was then compiled and summarised for each group to be used during the next Design Stage.

The questionnaires have been useful to quickly introduce the Design Team to the research groups by providing background information about their work and highlighting important issues.

The questionnaires also provide an initial record of each research group's needs, type of science, key equipment and associations with others, etc. The Design Team also learned about existing concerns, "what works and doesn't" and desired new features. In this survey, we hope to find patterns that we can organise the research groups around and optimise opportunities for collaboration and the sharing of facilities.

These questionnaires will evolve over time into more detailed formats such as concept design sketches, Schedules of Accommodation, Room Criteria Sheets (RCS); defining essential provisions to be designed into each room, Room Data Sheets (RDS) showing what each room looks like and equipment schedules with key building services, environmental and spatial requirements information.

MRC LMS USER SURVEY SUMMARY									Hawkins\Brov abell neg	en op							
	GROU	GENERAL RESEARCH SPACES															
	(one on	RESEARCH ACTIVITIES	RESEARCH TEA	M LABORATORY FEATURES - Positive / Negative	SUCCESS FACTORS	OPERATIONAL AG	UACENCIES L	AB WORKERS LABORATORIES	IN-LAB SUPPORT SPACE / EQUIP	IS SHARED TECHNOLOGIES	TISSUE CULTURE						
esearch Team or Department	shown	Brief description	Pl's, res staff, PG	UG. tech. Existing lab-what works well /	Major risks to goals/	Vision? Lab reamts: ACDP CL?, GM. Ph	sical proximity to other	io. using wet lab? Existing lab- what works	Cold rm, tissue cult, dark	I-V imaging, CBS, TC,							
	-		admin, guest	what doesn't?		cGMP, etc. tes	ms/support	edicated stations? well?	rm. ref/freeze	proteomics, bioinfo	L						
Computing & Bioinformatics Facility	A	Purpose built data centre, small comms rms throughout LMS, provides server and network for all LMS research groups		NEG: Commonwealth Building 1st floor, 5 years old (150sqm		Data centre plant, vertical stack comms rm, core			Servers, 16no racks - core structured cable, 2 rows	Wineless, access to Imperial Access point	*						
Group: Gabriela Ahmadi-Assalemi	14.4	for all LMS research groups	-	existing?]		network services	_		(core and fibre								
		MRCUMS							and a starting		Hawkins	Brown					
ioinformatics		USER SURVEY SUMMARY									abe	l nepp					
Group: Gopu Dharmalingam				GENERAL RESEARCH SPACES													
			(one one	RESEARCH ACTIVITIES	RESEARCH T		S - SUCCESS FACTORS	OPERATIONAL ADJACEN	DES LAB WORK	ERS LABORATORIES		PACES SHARED TECHNOL	OGIES TISSUE				
Koinformatics Group: Sanjay Khadayate			shown)		(quantity)	Positive / Negative		ENVIRONMENT ision? Lab regrets: ACDP CL2, GM, Physical pr			/ EQUIP	dark I-V imaging, CBS, TC	CULTURE				
Group, samply knausyste		Research Team or Department		Brief description	admin, guest	what doesn't?	el / Major risks to goats/v	sion? Lab regmts: ACDP CL?, GM, Physical pr cGMP, etc. teams / su	pport Dedicated st	t lab? Existing lab- what ations? well?	works Cold rm, tissue cult, rm, ref/freeze	dark I-V maging, CBS, TC, proteomics, bioinfo					
Administration			18	Hybrid experimental/ computation lab, wo	k 1 Pl, 3 research student (exper-	h staff + 3 Equipment / freezer rm to	o far Archaeal growth at sc	ale, 3no infors Ecotron + infors Proximity	o biochem 4no peak or no specific facility fino bench s	cupancy, Storage space is g	ood, Small fridge + -20 fr oods for lab, proximity to fur	ezer in Genomics, proteomine hood FACS, microscopy,	cs, -				
Administration		Molecular Systems Group: Dr. Toby Warnecke	11.3	w/ E. col + incresingly different species of extremophile archaea. Molecular biology in	cl computational	imental/ 1/3 admin, 1 benches ideal for communication	al (freezer) or computat	i Thermotron incubators, expertise, ional nearby sink, external gas or groups.	to specific facility the bench s good (not in	cluding current occupancy	(RNA work), incubat	or bioinformatics	_				
lead of Operations				Coning, RNA/DNA extraction, PCR MRC UMS	visit student/n	esearcher monitoring	storage (back-up)	store w/ piping + falsafes	shared equi	a housing)	space, shared cold r	n		wkins\Brown			
Group: Carole Swan		Quantitative Gene Expression	9	USER SURVEY SUMMARY									5	abell nepp			
	1 20	Group: Dr Samuel Marguerat	1.00		GROU	IP GENERAL RESEARCH SPACES											
Read of Finance	1		6200		MEMB	RESEARCH ACTIVITIES	RESEARCH TEA	M LABORATORY FEATURES - SI	CCESS FACTORS OF	ERATIONAL ADJ	CENCIES LAB V	ORKERS LABORAT	DRIES IN-LAB SL	PPORT SPACES SHARE	D TECHNOLOGIES TISSU	ε	
Group: Mohammad Famili	T.	Behavioural Genomics	0		(one or shown	0	(quantity)	Positive / Negative	EN	VIRONMENT			/ EQUIP		CULTI	URE	
	0	Group: Dr. Andre Brown		Research Team or Department		Brief description	PI's, res staff, PG	/UG, tech, Existing lab- what works well / M what doesn't?	ajor risks to goals/vision? Lab	regmts: ACDP CL?, GM, Phys	cal proximity to other No. us	ng wet lab? Existing lab	what works Cold nm, to	sue cult, dark I-V ima	ping, CBS, TC,		
Head of Laboratory Services Group: Dr Sharon Citrone	1			C			admin, guest	what doesn't?	cG	tear	o / swyson Dedica	wei?	rm, ref/fre	proteor	no, 0-01110		
urway. Ur sharon utrone	A	Vacancy		Genes & Metabolism												_	
and all shared as fractions. Harder a second	10	Group:		Gut Signalling & Metabolism	10	eno. Research Groups - Drosophila ar Metabolism, fly genetics, life spans,	d mice. 40no people (fu Gut Signalling, R	ture total), NEG: benches (+ facing walls), Te edox air curtain noisy / unused, no ne	mp control, storage, Mi mote food prep facility, dis	croscope work, Dros section rm between fly H2; H	opnira facilities, still use 3no gr 11 replaced, incubator spaces	(25no peak supply, war	a co2 pipe 25no micn te disposal dissection]	scope (plus Imaging quarantine - GM, AM	r, microscopy suite, √ I, primary cell		
ead of Laboratory Services, Health & Safety Group: Dean Norgate	10		1.00	Group: Prof Irene Miguel Aliaga	0	immunostaining, microscopy, metab molecular biology, gut signalling, TC	vic assays, Metabolism, Me	ture total), NEG: benches (+ facing walis), Te edox air curtain noisy / unused, no natural light, card access bu doors between spaces w	iding services resilience, lab	s and main lab, low risk m, o	uarantine rm, imaging - occupa	ncy), dedicated workflow,	It access size, 2no micro	cope, incubator culture,	CBS, in vivo,		
-	-	Vacancy Group: Anthony Uren?	-		250	Electrophysiology and sprainty, TC			ridiow/access layout GN me office infringe, HBS AH			- Cluster	heavily wrt. pri Circle	see rm/lab 21 Au 2	hoteo	_	
ead of Estates	2	croup: weakary urgh?		Metabolic Signalling		Electrophysiology work on mice - slo and cell machine (in-vitro and in-vivo	(Ino bay for		ks experiment success, cor	ntainment levels - tissue	ransportation of cells / to lab space	tanks cover	heavily wet, gel Electrophy benches & PCR designated 42 v. clean holding are	space, 3no anaesti	ethed rig (for		
Group: Novica Jevric	1	Vacancy		Group: Prof Dominic Withers	19	1	electrophysiolog visitors (lets)	bit vesearch is	rated break-down rms bre	eeing protocols, foactive waste		machines,	12 v. crean holding are Gareak out	as to shut down anaesth	etsed mice)		
	1	Group:				MRCLMS										Hawkins\Brow	
Laboratory Management Group: Hamilata Dewchand				Cellular Stress Group: Prof David Carling	13	USER SURVEY SUMMAR	r									abell nep	рр
Group: Hamlata Dewchand		Bioinformatics		Group: Pror David Caning	124		GROUP	GENERAL RESEARCH SPACES									
	6	Group: Dr. James Ware	6.0		10		(one one	RESEARCH ACTIVITIES	RESEARCH TEAM	LABORATORY FEATURES	SUCCESS FACTORS	OPERATIONAL	ADIACENCIES	LAB WORKERS	LABORATORIES	IN-LAB SUPPORT SPACE	ES SHARED TECHNO
frector of Bioservices Group: Prof Marina Botto	1			Metabolism & Cell Growth Group: Dr Susumu Hirabayashi			shown)	Brief description	(quantity) Pf's, res staff, PG/UG, tech,	Positive / Negative	/ Major dela /	ENVIRONMENT	Destinal new inches	No origan to be?	Existing Jub.	/ EQUIP	Winners on -
www. Pror Marina Bocco		Facility Heads			_	Research Team or Departmen	к	oner bescription	Pf's, res staff, PG/UG, tech, admin, guest	Existing lab- what works well what doesn't?	/ mayor risks to goats/vision?	Lab regmts: ACDP CL?, GM cGMP, etc.	teams / support	No. using wet lab? Dedicated stations?	Existing lab- what works well?	Cold nm, tissue cult, dark nm, ref/freeze	proteomics, bioinfo
aculty Operations			1	Metabolism & Gene Regulation	-	Genes & Metabolism			-				-		-		
aculty Operations Group: Stephen Pullen		Genomics & Proteomics Facilities Group: Dr. Laurence Game		Group: Dr Santiago Vernia				4no. Research Groups - Drosophila and mice.	40no people (future total),	NEG: benches (+ facing walls), Temp control, storage,	Microscope work,	Drosophila facilities, still us	e 3no groups, 40no lab	POS: Central CO2 pipe	25no microscope (plus	Imaging, microscop
		- ray, or, searches word	E)			Gut Signalling & Metabolism	a	Ano. Research Groups - Drosophila and mice. Metabolism, fly genetics, life spans, immunostaining, microscopy, metabolic assa molecular biology, gut signalling, TC	Gut Signalling, Redox	air curtain noisy / unused, n natural light, cand access doors between spaces	remote food prep facility,	dissection rm between fly	H2; H1 replaced, incubator	spaces (25no peak	supply, waste disposal workflow. IP	25no microscope (plus dissection), quarantine - 2no microscope, incubato	GM, AH, primary co
		WAPI (Whole Animal Physiology & Imagin		Cellular Identity & Metabolism		Group: Prof Irene Miguel Al	ata A	molecular biology, gut signalling, TC		doors between spaces		GMO, RNA extract/tissue	con-focal	clean (Rnase free) area	safety features, power	rm, CT rms, fly kitchen	histology, FACS
		WAPI (Whole Animal Physiology & Imagin Group: Dr Alex Sardini		Group: Dr. Mathieu Latreille				Electrophysiology work on mice - slice machi and cell machine (in-vitro and in-vivo)	e 11-12 researchers, 3no bay	5 -	Home office infringe, H&S	AH 2 barrier status,	AH - transportation of cells tissue to lab space		Electrophys heavily wet, g	el Electrophys eq rm/ lab as	AH - 2-photon
	- 18		1.1		1	Metabolic Signalling Group: Prof Dominic Withe	1.20	and cell machine (in-vitro and in-vivo)	(1no bay for electrophysiology), research	h	risks experiment success, isolated break-down rms	breeding protocols,	tissue to lab space		tanks cover benches & PCI machines, H2 v. clean	el Electrophys eq rm/ lab as R designated space, 3no holding areas to shut down (break out)	anaesthetised rig (fo anaesthetised mice)
		Transgenics and ES Cells		Redox Metabolism Group: Dr. Helena Cocheme		Wither and the second wither			visitors (lots)			radioactive waste				(break out)	
	- 18	Group: Zoe Webster		urbup: Dr. Helena Cocheme	3	Cellular Stress	72	Biochemistry, molecular and cellular biology, animal physiology	1 Pl, 3 research staff, 2-3 post-docs (average) and 2.1			No special requirements over and above routine	Metabolic signaling, metabolism, gene	No current lab writing space - benches used	Sufficient bench space (just), good location (close	Cold rm, TC, fridge / freeze	vivo imaging, WAPI
			1		0	Group: Prof David Carling	72		PhD students (average)	6 (plasticware / freezer space) difficult to incorporate share work spaces into lab	d	Institute/College regulation	metabolism, gene s regulation, cellular identity animal facilities	10no peak occupancy, i	5- to required facilities)	Cold rm, TC, fridge / freeeo rm, dedicated space radioactive isotope, in vive animal studies	o bioinformatics supp
		Microscopy Facility	100	Vacancy Group: Dr. James Leiper?					40no people (4no groups)	work spaces into lab	Snare - losk'	incubator/ quarantine /	animal facilities Other Drosophila groups,	8no average 40no lab spaces (4no	I stee centry'	animal studies 25no microscope (plus	metabolomics, Microscopy, fly peop
		Group: Dr. Dirk Dormann			1	Metabolism & Cell Growth	n	4no. Research Groups primarily involved w/ Drosophila and some mouse work- Santiyago		unused, kitchen bench space	Space - looking to expand	behaviour / fly rms, fly	labs close by (still use H2:	groups) in addition to fi		dissection), quarantine -	do mouse work, TC
		Biological Mass Spectrometry & Proteomi	1	Genes & Metabolism - Neurophysiolog	10	Group: Dr Susumu Hirabaya		Vernia 4no, Chris Studd - 10no, Helena - Sno		prep		(AH)	H1 replaced), incubator rm quarantine rm	, m		2no microscopes & incubator, CT rms	req
	- 18	Facilities		Group: Dr. Mark Ungless	1	-	10	Use in vitro, ex vivo and in vivo approaches to	1 Pl, 1-2 Postdoc, 1 PHD	Limited storage, more space	Very competitive field, need	Different approaches lie ce		4no	Bench space sufficient, goo quality of TC rms		Yes
	- 18	Group: Dr. Holger Kramer	1.00			Metabolism & Gene Regulation		Use in vitro, ex vivo and in vivo approaches to identify the molecular mechanisms involved metabolic homeostasis in health and disease	n student, all performing lab-	for freezers, distrance from	Very competitive field, new to dovelop many novel research tools	Different approaches (ie ce wash, mouse studies), need access from warm labs to	Dominic Withers, David		quality of TC rms		
		Flow Cytrometry Facility		Mouse Group - unknown	- 8-	Group: Dr Santiago Vernia		 A noncessario in neuro 200 036268 	CONCENSION MORE	MiliQ water, ice, centrifuger	Control 1995	access from warm labs to different facilities	bioinformatics facility				
	- 18	Flow Cytrometry Facility Group: Dr. James Elliott	100	Group: Dr. Vincenzo De Paola	1			Primarily procedural (considerable more that	- 1	POS: Self sufficient- org of	AH not big enough - current	Incubate cells (separate /	Labs nearby, central rm w		Self sufficient - organisatio	in Imaging rms (close to lab).	. Electrophysiology k
					770	Cellular Identity & Metabolism Group: Dr. Mathieu Latrella		holding) holding space, no breeding, all work open cages, no quarantine	*	disease / barriers etc NEG: Equip noise / heat not	working practice, floor area (1900sqm), procedure rm masks	AH, Cages - mice (900), rate (200), IVC, feeding system i	centrifuge (close to TC). Separate servicing and		of disease / barriers etc, entry areas for gown-up	in limaging rms (close to lab), TC and Invivo Rms next to AP, terminal rm, 3no fridg per lab, behavioural rms	shared (Mark / Dor lee isolated, IVC - CLAN
	- 18	Bioinformatics		Integrative Skeletal Physiology		Group: LA. Matried Latreia				good in labs; hold & proc	masks	small wash	delivery of food / animals			per lab, behavioural rms	breeding
	- 18	Group: vacancy (?)		Group: Dr. Saravana Ramasamy		Barday Metabolism	-	1									
			1.1		-	Redax Metabolism Group: Dr. Helena Cocheme		1									
	- 18	Grants, Engagement and Comms (GECO)		Mouse Group - unknown Group: Dr. James Tomlinson			E NO		-					-		-	
		Group: vacancy (?)		unways un sames romanson	N.	Vacancy											
				Induces	0	Group: Dr. James Leiper?	E.										
	- 18	Grants, Engagement and Comms (GECO)		Unknown Group: Dr. Antonio De Marvao	1		1 million 1		n Typically around Sne	Not enough space	Home Office related	Enclosed is better - animal		Rep	Close to CRS, enclored rm	Fumehood, washup space	Microscopy, hisiale
		Group: Dr. Almut Caspary			34	Genes & Metabolism - Neurophy	siology	preparation, molecular biology, some in vivo animal procedures (in fumehood and surgery	_		restrictions, electrical noise	procedures and		1°		and a start of the	and the second second
				Integrative Biology		Group: Dr. Mark Ungless		animal procedures (in fumehood and surgery dedicated rm)	-		interfering with electrophysiology equip	ereustophysiology equip, some GM work					
				formation of the second s					-								
				Computational Regulatory Genomics Group: Prof Boris Lenhard	20	Mouse Group - unknown Group: Dr. Vincenzo De Pac	2										
			1.1		1.12	Group: Ur. vincenzo De Pao			1								
			- 18	Single Molecule Imaging	-0	Integrative Skeletal Physiology	y	4									
				Group: Prof David Rueda	1	Integrative Skeletal Physiology Group: Dr. Saravana Ramas	amy										
			- 18							1			1				
			. 1		-		- 6										
				Cardiovascular Magnetic Resonance In B. Ganatics	uging	Mouse Group - unknown		8									
					ueine	Mouse Group - unknown Group: Dr. James Tomlinso		6m									
				Cardiovascular Magnetic Resonance In B. Ganatics	weine	Mouse Group - unknown Group: Dr. James Tomlinso	TV.	10		-							
				Cardiovascular Magnetic Resonance In B. Ganatics	uging 🛒	Unknown											
				Cardiovascular Magnetic Resonance In B. Ganatics	utint 🕠	Mouse Group - unknown Group: Dr. James Tomiknou Unknown Group: Dr. Antonio De Mar											
				Cardiovascular Magnetic Resonance In B. Ganatics	utint	Unknown Group: Dr. Antonio De Mar											
				Cardiovascular Magnetic Resonance In B. Ganatics	usive	Unknown				MIG-Bensievet snary	Margad of F1 - nor-	D's securities in a second	I umboote Merice		Smill titk synar p-ost-	Standing derive not -	
				Cardiovascular Magnetic Resonance In B. Ganatics	usine 🛒	Unknown Group: Dr. Antonio De Mar Integrative Biology Computational Regulatory Geno		One large m (nostly equipment) plus. bioinformatica / computational work		NEG: Breakout space noisy- not used, located in athum,	Merged w/ ICL - new machines. Additional high	PCs acoustically isolated from microscopes,	Lymphocyte [Merkensch- lager], single cell genomics		Small sink, power supply, storage, workbench, good	particular requirement.	
				Cardiovascular Magnetic Resonance In B. Ganatics	ugine 🛒	Unknown Group: Dr. Antonio De Mar Integrative Biology		One large rm (incisity equipment) plus bioinformatics / computational work	-	NEG: Breakout space noisy- not used, located in strium, large rm - crowded	Merged w/ ICL - new machines. Additional high cooling for workstations - noise				Small sink, power supply, storage, workbench, good chairs	Standing desks not a particular requirement, dealt w/ case by-case basi	is .
				Cardiovascular Magnetic Resonance In B. Ganatics	ugine 🛒	Unknown Group: Dr. Antonio De Mar Integrative Biology Computational Regulatory Geno Group: Prof Boris Lenhard	nics	bioinformatics / computational work	· ·	POS: Lots of storage, sinks				i.	Small sink, power supply, storage, workbench, good chairs Lots of storage, sinks	articular requirement, dealt w/ case-by-case basi	les. Cold rm - 1 large fi
				Cardiovascular Magnetic Resonance In B. Ganatics	ugine	Unknown Group: Dr. Antonio De Mar Integrative Biology Computational Regulatory Geno Group: Prof Boris Lenhard		bioinformatics / computational work Integrative Biology - lots of microscopes (10th floor CWB and 2nd floor CRB), Epigenetics -		POS: Lots of storage, sinks NEG: 1no large fly rm for 3				i.	Small sink, power supply, storage, workbench, good chairs Lots of storage, sinks	articular requirement, dealt w/ case-by-case basi	les. Cold rm - 1 large fly
				Cardiovascular Magnetic Resonance In B. Ganatics	ugine	Unknown Group: Dr. Antonio De Mar Integrative Biology Computational Regulatory Geno	nics	bioinformatics / computational work		POS: Lots of storage, sinks				8no - bench sample prep, build micro- ; scopes, 2/6 researcher	Small sink, power supply, storage, workbench, good chairs Lots of storage, sinks	particular requirement, dealt w/ case-by-case basi	les. Cold rm - 1 large fly
				Cardiovascular Magnetic Resonance In B. Ganatics	uging	Unknown Group: Dr. Antonio De Mar Integrative Biology Computational Regulatory Gene Group: Prof Boris Lenhard Single Molecule Imaging Group: Prof David Randa	nics	bioinformatics / computational work Integrative Biology - lots of microscopes (20th foor CMB and 2nd floor CMB), Epigenetics - yeast keeper, molecular, genetics, time split evenly between lab and pc		POS: Lots of storage, sinks NEG: 2no large fly rm for 3 groups - not 3no different,	Merged w/ICL - new muchines. Additional high cooling for workstations - noise People to track (rach need capabilities, not near fly lab or TC			8no - bench sample prep, build micro- ; scopes, 2/6 researcher	Small sink, power supply, storage, workbench, good chairs Lots of storage, sinks	articular requirement, dealt w/ case-by-case basi	les. Cold rm - 1 large fly