REGISTERED SCIENTIST – COMPETENCIES REPORT

All evidence you submit for professional registration must be endorsed by your supervisor / manager

PLEASE READ GUIDANCE NOTES FOR APPLICANTS BEFORE FILLING IN THIS FORM

Name:

A: Application of knowledge and understanding: Identify and use relevant scientific understanding, methods and skills to address broadly-defined, complex problems

Competencies	Guidance	Evidence Chosen
A1: develop, maintain and extend a sound theoretical approach to application of science and technology in practice	This means that you can show that you have a sound theoretical understanding of the area in which you work. That you also continuously keep up-to-date with developments in your field and are able to understand and apply new developments to your area of work. For instance your example may describe how you: a) take part in a journal/publication review group within the workplace b) suggest updates to the way in which designs, prototypes, processes, computer programmes, experiments or procedures are approached and carried out based upon new knowledge of technology or underlying theoretical principles c) undertake further academic / vocational / self-study or technical	Why: *(Why do you need to keep up-to-date in the area of work that you do)* 1) I work in a laboratory based research environment where Kit based technological assays evolve, requiring updated practice informed by up to date technical literature 2) Similarly, the theoretical underpinnings of your chosen discipline change, necessitating perusal of current scientific literature: **In my current role** I interface with multiple PIs on a plethora of research based projects (in addition to lab management duties) all loosely falling under the ambit of cardiovascular research 3) Specifically, these projects have been directed towards growth factors that putatively influence formation of collateral blood vessels in the vicinity of atherosclerotic occlusions; gene expression conferring protection to cardiotoxicity by foreign substances (xenobiotic medications) in the heart; and modulation of tumour diapedesis by platelet factors 4) This has necessitated consulting background research literature in these sub disciplines and also technical literature pertaining to relevant wet based laboratory assays 5) Similarly, **in a prior position (validated through reference #2)** in immunology and infectious diseases at the University of

	training in your current or advancing field of work	Edinburgh my principal lab based project was to develop a high through put assay to screen compound libraries to identify subsets of compounds cytotoxic to *Trypanosome Brucei*: Current relevant literature was similarly consulted 6) In another but not referenced cited post (circa 2014-2015; see my *extended CV* for details and referee) I was expected to contribute to the materials & methods sections of published manuscripts & provide background methodology & principles to a Ph.D students in order to submit posters' at conferences and author peer reviewed publications
		What: *(What is it that you need to keep up-to-date)* 1) In my current post, subject literature pertaining to aspects of cardiovascular research pertinent to one or more projects I personally participate in 2) Similarly, literature describing the principles and practice of pertinent assays designed to elucidate such cardiovascular phenomena 3) In my prior infectious diseases position at the university of Edinburgh personal perusal of Trypanosome & drug discovery literature, including assay development literature in Journals such as *Nucleic Acid Research* & *Nature Methods* 4) In a recent (but not cited position) within Immunology at the University of Nottingham (circa 2014-2015) I contributed to the writing of published manuscripts and linked to this activity

		provided detail, theoretical principles and data clarification to Ph.D students in order for them to submit posters at national and international conferences and also formulate manuscripts for peer reviewed publication
		How: *(how do you keep up-to-date)* 1) As described above I personally consult both technical and subject based research literature in notable Medical Research Journals 2) In addition to the above & with specific reference to technical literature I augment my knowledge by contributing and adducing from technical forums such as Research Gate

		3) In the case of a research project investigating tumour diapedesis by *In vitro* modelling, posing a question about a seminal assay on research gate culminated in personal communication with somebody well versed in this assay who could provide technical literature and answers to specific assay related queries 4) In addition to analogous activities in my prior Infectious diseases position and work directed towards drug discovery I also participated in a monthly journal club where literature pertinent to all aspects of *Trypanosome r*esearch, taken from particular papers in research journals was appraised 5) **In a former position at the University of Nottingham (circa 2014-2015)** I spent time writing up the materials and methods of manuscripts for publication pertaining to analytical methods I assisted and trained Ph.D students in *(RT PCR* and *real time qPCR*): See my *extended CV f*or reference details, if required. In addition I communicated in person at the time with Ph.D students regarding such materials and data and provided a general theoretical basis and principles of such (gene expression) analysis. Subsequently, in my present post, I communicated with these students via e mail, clarifying data problems and requisite presentation requirements for publication, rooted in theoretical principles, which I explained. Thus far, this has resulted in one major publication as well as a series of both National & international conference poster presentations, with myself as a co author

A2: apply underlying scientific concepts, principles and techniques in the context of new and different areas of work	This means that you can explain the major reasons for undertaking new and different work. Your example may for instance describe how you: a) work in a new subject, in a different discipline, area or with new material. You should be able to explain and describe in technical terms the main components/elements/tools/material etc. involved and why you are carrying out the new work. b) are involved in carrying out a new procedure, process, or design; you should be able to explain from a technical perspective why you are using this and why it is relevant to the new area of work. c) are involved in using different or new design or experimental model; you should be able to explain why you are using that model, how you are using it and what the results might mean.	Why: 1) **In my former infectious diseases position**, monies had been made available from both *NIH*, *USA*, *Welcome* trust and MRC to develop a novel simple and high through put assay for small screening compound libraries to identify lead compounds with putative efficacy against *Trypanosome Brucei*, the etiological agent of most cases of human sleeping sickness *(HAT)*. This was motivated by the fact that extant chemotherapeutic regimens are ineffective, difficult to administer and ultimately toxic 2) **In my present position** I have been asked to develop an *in vitro* model for how tumour extravasation via blood vessels is affected by platelets: Why ? This is motivated by the fact that tumour metastasis is accentuated by blood clots with platelets (or specifically exosome platelet factors) proven as the pathophysiological mediator. The work is funded by *Astra Zeneca* who are interested in identifying drug substances that might block these exosome mediators 3) Another example in my present post would be devising methods to amplify and then measure expression of isoform specific genes of interest (linked to a separate cardiotoxicity project). This was necessary to elucidate whether cardio protection in our *in vitro models* was linked to general expression of particular genes or conferred by by particular isoforms derived from alternative transcripts

		What: 1) Develop a simple, stream lined and cost effective assay for screening small compound libraries to identify putative lead compounds with antagonistic efficacy against a Trypanosome Target protein devoid of an *ortholog* in the human host (on account of a unique RNA editing process in *Trypanosomatid* parasites not found in humans 2) Develop an *in vitro* model of tumour metastatis which simulates the interaction between tumour cells and endothelium in the presence of platelet factors 3) Devise an SOP and then train students with regard to mining data bases such *EBI/Ensembl* and *Genbank* for transcript specific isoforms of candidate genes and then demonstrate methods for teasing out those primers using isoform specific primers
		How: 1) The first stage in this (drug discovery) assay development procedural pipeline was to find an optimal method for expressing and purifying a recombinant soluble target protein: In particular *RNA Editing ligase 1 (REL 1)* which has no equivalent *ortholog* in the human genome and thus potentially represents a parasite specific target: Having consulted the literature, experts in the field and trialled various pilot scale expression models, abundant soluble phase protein was achieved by expression in the *E coli* strain *BL21 DE 3* by commencing induction with a simple heat shock and then expressing the recombinant protein over a protracted time period (20hrs) at a sub ambient temperature (18^{o}C). These expression conditions were conducive to protein production with minimal mis folding and thus soluble active protein compatible with a functional assay.

		2) The next obstacle was to discover methods for long term storage of the protein @ -80^{o}C without losing activity upon freeze thawing: This was achieved by Glycerol stabilisation @ 10% (v/v) coupled with particular additive known to help promote retention of nascent structure through a clathrate mode of action. The bench work was a combination of guidance from literature extolling 'best practice' coupled with empirical investigation 3) Having produced soluble, stable target protein preliminary pilot scheme evaluated the effects of known inhibitors on *REL1* based on a radio ligand assay followed by antagonism of REL 1 with substances predicted to have antagonistic efficacy towards *REL 1* based on *in silico* modelling. This 'proof of principle' culminated in a major publication in *PlOS* with myself as joint first author and also first author poster presentations at National infectious diseases conferences. Joint first author status was conferred because all bench work and preliminary literature investigations were performed in dependently by myself 4) The final stage of this procedural pipeline having demonstrated proof of principle was to develop a stream lined high through put assay to mass screen compound libraries. This required assay development in the context of (*Michaelis Menten*) enzyme kinetics & substrate, Fluorometric adducts & considerations about how best to quantify target hits in terms of 'best practice' viz. a statistical parameter called the *Z score*. 5) All biochemical parameters were successfully and personally developed by me and the assay was subsequently used in drug discovery centres to identify 'real hits'; Once again resulting an *Oxford University press Journal publication (NAR)*, with myself as joint first author as well as joint first author on numerous posters @ national as well as international conferences

		6) I**n the context of my present position** and simulating tumour metastasis in a platelet rich environment based on tissue culture modelling, The first task was to develop a simple stream lined model of tumour endothelium interaction in culture: This has been achieved by seeding *Boyden chambers* with *Huvec* cells followed by additional seeding with a tumour cell line (*HT 29*) and then evaluating transmigration of the latter cells through the endothelial barrier. All seeding parameters have been personally and empirically investigated by myself, with proposals put at bi weekly meetings to my PI who then comments on my ideas. In addition, I have reached out to the scientific community at large via *Research Gate* to solicit best practice and also consulted current literature on transmigration to adopt and adapt such published precedents. The next stage, which will commence shortly, will be to set up the full transmigration assay, where purified platelets are added to the mix together with putative antagonists of platelet exosome factors to identify substances demonstrating putative inhibition of *HT 29* transmigration 7) In the context of isoform specific gene expression linked to cardio toxicity protection in select Myocyte cell lines I devised an SOP for students which took them from mining transcripts in data bases like *EBI/Ensembl* to primer design which includes general aspects of primer design, e.g. avoiding hair pin loops, formation of heterodimers and crucially how to select target sites for such optimal primers in order to amplify just one gene transcript and not another; viz. selection of exon-exon sites only found in that spliceform. Having compiled an extended SOP a number of students were walked through it in a tutorial type discussion of the procedure

A3: analyse, interpret and evaluate relevant scientific and technology information, concepts and ideas and to propose solutions to problems	This means that you can describe how you observe the results or examples from your work and that of others and explain their relevance. How you are able to review the work and ideas of others and propose ways in which problems/difficulties may be overcome. Your example could show how you: a) enable others to be able to analyse and interpret their work and advise on how they may overcome problems. b) review a number of relevant literature/manuals/designs and present your findings to others. c) develop new methods/approach based on information or outcomes from previous work by others or yourself.	Why: 1) We have an experimental cohort of formalin fixed paraffin embedded (FFPE) tissue samples that are refractory to antibodies targeting *CD31*, a marker of new blood vessel formation. This experimental cohort is designed to investigate whether drugs delivered in the vicinity of a clot by stent can promote formation of new blood vessels as evinced by immunohistochemistry (IHC) using *CD 31 inter alia* 2) Another example in my current position of proposing solutions to experimental problems concerned another project I was linked to where I benched supervised a Ph.D student regarding experimental design and data interpretation linked to project work investigating gene expression in experimental cell lines simulating human myocardium. In essence, I/we needed to come up with a solution or standardised method to reliably quantify expression of genes of interest (GOI's) in the context of different cell lines with different and defined physiological properties regarding cardio toxicity 3) **In my prior infectious diseases post at the university of Edinburgh** (validated by Ref. #2) it proved necessary to produce large amounts of soluble, active and stable recombinant target protein as pre requisite to develop and implement drug screening with a FRET based assay, as elaborated in a previous competency answer

		What: 1) To evaluate formation of new blood vessels in experimental samples we needed to find a way of renaturing or retrieving the *CD 31* epitope that is targeted by anti *CD 31* antibodies and thus quantifiable by IHC. Formerly, the epitope had been denatured by the fixation process rendering IHC unworkable 2) With regard to gene expression and cardiotoxicity devise a workable empirical standardised method for evaluating gene in expression in human derived myocardial cell lines 3) To produce large amounts of a soluble recombinant target protein, stable in long term storage in order to develop and implement a drug screening program (of small compound libraries) to identify putative antagonists with potential utility as a chemotherapeutic agent to treat *Human African Trypanosomiasis (HAT)*
		How: 1) In order to un mask the epitope Denatured by tissue fixation there are various methods of antigen 'chemical retrieval' that needed to be tried. This was done by me personally and based on extant data but also analogous optimisation I had performed in a previous position, I evaluated an improvised method based on standard practice. This did indeed unmask the CD31 epitope: As a consequence of this optimisation, entirely conceived and performed in the laboratory by myself we are now in a position to begin screening the experimental cohort and answer the question. 'Do certain growth factors promote collateral blood formation' in the vicinity of a simulated Atherosclerotic plaque (in experimental rat models' 2) In order to standardise gene expression data derived from real time qPCR platforms (*ABI Viia 7*) it was first necessary to evaluate

		a panel of 'housekeeping genes' (for normalising expression between different biological replicates) by gel based RT PCR to identify those with strong and consistent expression in the context of particular myocardial cell lines. The sub set of such genes that satisfied these criteria where then further evaluated by sybr green real time qPCR; recapitulating gel based RT PCR to make sure such genes were strong and stable in the context of real time PCR: Although this bench work was not performed by me, selection of appropriate cardiac housekeeping genes, based on published precedents & discussions on *Research gate*, including soliciting answers to pertinent experimental questions; design of RT PCR and real time qPCR experiments and interpretation/data troubleshooting, including selection of best software for evaluating stable gene expression in our experimental system, cf. *Normfinder*, were performed by me and necessary experiments carried out by the Ph.D student under my direction. 3) **Regarding production of stable, soluble and abundant amount of a recombinant target protein, underpinning a HAT drug discovery** program at the University of Edinburgh, my first and personal task was to perform small scale pilot expression experiments to investigate yield and activity of soluble recombinant protein. This was based on guidance from my PI, precedents in the literature and conversations with protein biochemists in the core proteomics facility at the University of Edinburgh. In essence expression in *E Coli (BL21 DE3)* can result in production of large amounts of in soluble inclusion bodies not fit for purpose: This is due to mis directed post translational modification coupled with crude expression conditions exacerbating protein mis folding *in vitro.* As a result of literature, e.g. *Nature Methods* and guidance from protein biochemists and discussions with my PI empirical evaluation resulted in large amounts of the active fraction we required to implement the drug

		screening program: In essence, the solution to insoluble *inclusion bodies* in the context of our experimental system was to include a heat shock procedure in the protocol and then commence expression over a protracted time period at sub ambient temperatures. The former kick starts heat shock proteins that turn on protein expression efficiently whereas the latter ensures that ensuing expression results in a high proportion of soluble active protein by minimising misfolding

B: Personal responsibility: Exercise personal responsibility in planning and implementing tasks

Competencies	Guidance	Evidence Chosen
B1: work autonomously while recognising limits of scope of practice	This means that you can show how you work with no supervision for certain key tasks, experiments or procedures associated with your role, whilst understanding when you need to seek input from either your supervisor or others. You should be able to explain how you carry out certain work with no input from your line manager and describe how/what you report back in detail to her/him on completion.	Why: 1) **My current role as a 'core research technician' is a centrally funded support role and my overall job scope is to offer technical support to individual end users' particularly students with limited laboratory experience and also provide and maintain a fully functioning multi PI large molecular biology laboratory.** I was hired into this position based on my abundant experience in both ambits and as such I am expected to organise my own time and interact with students, PIs admin and outside technical representatives with minimal input from my line manager 2) **In my prior position at the University of Edinburgh (Ref. #2)** I was, as my PIs first employee in the UK, having come to the UK on an *MRC fellowship* from the USA, I was expected to assist with lab set up from its inception and also set up a drug discovery project, building on prior work in the USA

		What: 1) Organise my own work schedule and objectives in order to autonomously support research projects of students by technical training and troubleshooting; set up and discharge personal bench projects with PIs; and maintain a fully functioning molecular biology lab through stock taking and ordering consumables; auditing a small consumables budget by liasing with finance staff and collaborate with outside representatives to trial new products in order reduce costs and improve experimental procedures, i.e. procure more 'bang for the buck' 2) Recapitulating point 1), set up a new laboratory with minimal supervision and also implement a drug discovery program, building on prior work in the USA
		How: 1) Based on prior experience I manage my own time and set my own priorities; both with regard to project work and running a busy multi user molecular biology laboratory. In essence, this requires efficient time management in which one or more bench projects are intercalated with housekeeping duties to satisfy both sets of work objectives. Regarding lab management I discharge this aspect of my job description completely independently based on prior personal practice; I simply keep my line manager in the loop. Where bench project work is concerned I discharge technical duties independently but recognise the bigger picture informing

		why I do what I do is outside my own expertise (requiring theoretical expertise in the actual subject matter). Accordingly, I will try and trial particular technical solutions to problems associated with experiments of my own volition but the initial project scope is set by a PI who I will meet with on an intermittent basis. These progress meetings take the form of me presenting material(s)/results, usually in power point format as a personal presentation for comment and scrutiny. Technical details tend to be a 2 way discussion, based on my own findings and discussion elicited by me via forums like *Research Gate* but project priorities, vis-à-vis how they conform to the bigger picture and permission(s) to order relevant experimental consumables are given by the PI **2) Regarding set up of the lab and project work at the University of Edinburgh:** I spent the first 3 months in post: • Procuring quotes for key pieces of equipment • Purchasing such equipment and consumables with permission from my PI/line manager • Organising the physical space in the lab including attendant organisation of fridges and freezers for perishable consumables for subsequent project work to be carried out by myself and other lab staff employed subsequently Having set up the lab, I liased with my PI to identify bench work priorities and project scope with reference to the aforementioned drug discovery program I personally and independently performed in the lab. To autonomously perform this lab work, I versed myself with key achievements in the USA and then identified technical strategies to achieve key practical objectives as already outlined, viz. efficient production of soluble and stable recombinant target

		protein (*rREL 1*) and subsequent optimisation of the fluorescent assay utilising *rREL 1* with reference to substrates, enzyme kinetics and statistical evaluation of preliminary hits. My principal role was to independently perform the wet science and inform my PI of progress and potential future experiments. He would ratify progress; confirm future objectives and also modify experimental objectives in line with MRC project milestones and finance. Progress meetings were weekly and took the form of one on one *Power Point* presentations of data, experimental design and future priorities. In addition, I was expected to present via *Power Point* to publicly to the group as a whole in order for my PI but also post doctoral fellows to comment on my data and plans
B2: take responsibility for safe working practices and contribute to their evaluation and improvement	This means that you can describe how you accept responsibility for working safely. How you may be responsible for the generation and communication of some of the following (but not limited to) and can give examples: ▪ risk assessments associated with your work ▪ relevant Health and Safety regulations, e.g. COSHH, Noise, Manual Handling, DSE ▪ relevant Home Office Licences	Why: 1) In my current position I am responsible for all aspects of the labs operation and Infra structure, including Health and Safety. Similarly for my former cited position at the University of Edinburgh

	▪ safety training courses you have successfully completed for your laboratory role ▪ any monitoring of safety within your work, e.g. for radioactivity, chemical exposure ▪ safety equipment and control measures necessary to work safely and protect others. ▪ carrying out safety inspections of premises and equipment, producing reports and making recommendations. You may also be responsible for an aspect of 'safety monitoring or training' and (if relevant) a description of this should be included.	What: 1) Devise and ensure safe implementation of Good laboratory practice, complaint with *COSHH*, in my current run 2) Devise and ensure safe implementation of good laboratory, *COSHH* complaint practice in my former cited role at the university of Edinburgh How: 1) **In my current position,** I am responsible for completing *COSHH* forms for communal hazardous chemicals I order via *smarter* purchasing 2) In addition, I am responsible for training students in the completion of such forms and making sure they understand and comply with *GLP* in terms of PPE and waste disposal: Training of novice students is an integral part of the students introduction/induction into the lab *3)* Apart from this induction into health and safety, I provide an *ad hoc* service for anyone purchasing hazardous/toxic chemicals linked to a new procedure if they require help completing or complying with the *COSHH* form, e.g. interpretation of *hazard statements*; *pictograms* & *risk phrases* 4) In addition, safe working practice is inculcated by training, e.g. safe waste streaming by paying attention to such things as methods and routes of disposal: A seminal example would be making sure that *cytotoxic* chemicals are only handled in the fume

		hood and are disposed of in a cytotoxic bin, collected and eradicated by incineration; as opposed to working on the open bench and streaming such waste via standard orange biological. waste bags, neutralised by microwaving and destined for land fill. An example of this would be use of *Trizol* for extraction of RNA 5) To ensure that such practices are continually adhered to, apart from initial training of students we have monthly lab meetings where obvious transgressions are pointed out and GLP is clarified in such meetings and subsequent lab minutes. These monthly meetings are augmented by *ad hoc* e mails when mal practice is identified 6) Another example of safe working practice compliant with *COSHH* is storage of chemicals; This has been set up by me as part of my lab management remit: Specifically, acids and alkalis are separated from oxidising agents in separate metal fire proof cabinets and volatile cabinets are stored in ducted, ventilated solvent cabinets 7) To comply and implement the above I have attended Leicester specific COSHH and risk assessment courses 8) I**n my former position at the University of Edinburgh,** I was responsible for all aspects of health and safety including *inter alia GLP*, storage and safe handling of hazardous substances and waste streaming. Thus all of the above considerations and practices were similarly carried out 9) Furthermore, to gain an appreciation of such practices and how they are informed by HSE legislation I attended a 1 week Biosafety course with 1 full day of examinations and an oral presentation, culminating in the award of Bio safety practitioner (Foundation Level #1)

B3: promote and ensure the application of quality standards	This means that you can show how you are aware of the quality standards necessary for the work being carried out by you and others. You should be able to describe examples of how you promote these standards and ensure that they are applied. You may for example: a) produce and communicate protocol standards (such as good laboratory/workshop/design practice) b) train others to recognise when something has not been carried out correctly and explain the impact this could have. c) contribute to the analysis of your own and others' work and explain the impact of good and bad data and outcomes d) recognise when your own and others' work needs to be repeated or the	Why: 1) I am responsible for a managing a large multi user lab where all personnel are required to adhere to GLP and be mindful of each others' practices to render this environment both safe and competent 2) In my prior role at the University of Edinburgh the same existential practices and considerations pertained What: 1) In both my current role in the BHF cardiovascular centre at the University of Edinburgh and former role in Infectious diseases at the University of Edinburgh, part of my remit was to ensure safe and competent working practice through administering *COSHH* and paying due regard to laboratory organisation and *GLP*

	methodology updated and be able to communicate the reasons for this in terms of reproducibility or quality standards for example.	How: 1) In both such roles to promote and sustain the application of quality standards I • Make sure that for all new chemicals that are communally ordered on behalf of the lab, *COSHH* forms for hazardous chemicals are completed • Furthermore, these are made available via our departmental intranet and all new lab staff are aware of their location via an induction pack • For new students (in particular) performing laboratory procedures with one or more of these chemicals they are instructed in implicit hazards and *GLP* by me before commencing such procedures • In addition, for procedures utilising non communal but hazardous chemicals I make sure the students are aware of how to fill out relevant *COSHH* forms (by accessing and transposing MSDS information onto the departmental *COSHH* forms) and implied safe practice; In particular, storage & handling of such substances; disposal routes & PPE • Promotion of such safe *COSHH* compliant working practices as mentioned is reinforced through monthly lab housekeeping meetings which I contribute to in terms of housekeeping points and on occasions publicly conduct as well as devise minutes (for general circulation to lab staff) 2) In addition to safe practice, promotion of quality standards is also concerned with conduct of *GLP* in terms of technical procedures. In that regard:

		• I train new students in the nuances of particular techniques, e.g. extraction of RNA via use of columns and *Trizol*, paying attention to use and disposal of *Trizol* in the fume hood cytotoxic bin as well as subsequent proficient chloroform extraction and ethanol precipitation; inculcated by SOPs I devise for students 3) Another example of 'promotion of quality standards' is the attendant re organisation I have conducted in our micro biology/ cloning lab since the inception of my position: In particular, I now insist that • Virgin LB agar plates are segregated from inoculated plates in a 'clean fridge' (where reagents for plasmid preps etc are also stored) • Virgin plates are kept sealed by para film to minimise contamination by fungal spores • Inoculated plates are segregated in a so called 'Dirty fridge': Such plates are sealed with Nesco film and dated A. To prevent cross contamination B. To make sure that plates are disposed of within a 6 week time frame, after which time colonies are desiccated and not viable (for plasmid purification) 1) Finally, inculcated LB agar plates must be disposed in separate bins (for incineration) and not general biological (Orange bag waste) as any agar from a breached orange bag that escapes during autoclaving can block the filters and put the autoclaves out of action All such competent practices are promoted by making sure that every new user of the cloning/Micro biology lab is subject to

		induction by me and also via laminated instructions on the friges and bins within microbiology 4) The same considerations and practice regarding implementation of laboratory techniques and competent practice were devised and implemented by myself at the University of Edinburgh as an integral lab management responsibility
B4: take responsibility for planning and developing courses of action as well as exercising autonomy and judgement within broad parameters	This means that you can describe why and how you accept responsibility for planning and developing relevant courses of action within the required time frame. You should be able to give an example that demonstrates that you are able to do this with no supervision using your own judgement within the parameters of your broader role. This might include (but not be limited to) an example of: ▪ devising contingency plans in the case of a safety breach (e.g. spillage of radioactive material). ▪ assessing the risks of equipment and plant failure on experiments,	Why 1) **In my current role**, I have dual responsibilities for lab management and support, as already elaborated; Training students; devising SOPs; stock taking and ordering consumables as well as managing and auditing a small consumables budget; and intercalation and personal participation in a number of research projects. This involves strict time management and making sure that every bodies (diverse) needs are met on time 2) In addition, as the primary support person in a modern genomics lab I am also responsible for a number of complex pieces of equipment, including a bank of *PCR* machines, multiple real time qPCR platforms (*Viia 7* and *Rotor genes*) and a *Nano drop.* These require maintenance, annual servicing and *ad hoc* repairs. All such responsibilities fall to me 3) **My prior cited role** at the university of Edinburgh engendered identical responsibilities and requisite courses of action

	production, and procedures and how to deal with such situations. ▪ developing and planning training of personnel to cover essential tasks in the event of staff absence ▪ determining which equipment/machine/tool needs regular maintenance and servicing and planning the timetable and personnel involved. ▪ understanding what must be undertaken in terms housekeeping in the laboratory/workshop/section, planning and developing appropriate methods and timetables to meet the requirements.	What: In both roles under discussion: 1) Maintain equipment by timetabling maintenance activities 2) Liase with engineers in the event of equipment break down & sub optimal data output (implying faults, e.g. contaminated hot blocks and heat sensor fatigue on board the *Viia 7*) 3) Liase with engineers to arrange annual servicing of equipment; in particular the *Viia 7* real time qPCR machine & *G Storm* PCR machines 4) Liase with outside companies regarding recycling provision: In particular, recycling of empty tip boxes via courier collection 5) Weekly stock taking and ordering of lab consumables in the chemicals area and also molecular reagents in fridges and freezers 6) *Ad hoc* thawing of a bank of -20°C freezers and occasionally -80°C freezers, making sure contingency plans are in place to store in back up freezers during thawing and users' are kept informed and when this will happen and for how long (before restitution of normal storage locales) 7) Monthly enumeration of signed consumables and computing total costs for the purposes of recharging using *Excel* scripts; liasing with finance staff in that regard 8) Annual auditing of the consumables budget which I personal spend on such consumables – and are responsible for – to ensure that expenditure is matched by income generated: This consumables budget which I manage amounts to about £50,000 worth of income and expenditure per year 9) Making sure that in my absence the aforementioned requisite tasks are performed by another core technician

		How: 1) With regard to equipment maintenance: • Acid cleaning of the pH electrode on a monthly basis; • Acid cleaning of the pedestals on the *Nanodrop*; • Weekly wiping of data on board the instrument Console linked to the *viia 7* real time qPCR machine (to prevent memory saturation and cessation of running) • Yearly calibration of the viia 7 ensuring optimal S;N from output data is sustained 2) Regarding equipment failure, repair and annual servicing logging a call with the appropriate company, e.g. *Thermo Fisher ABI* (for the real time *Viia 7* qPCR machine) and making sure that contracts/monies are available for such activities via my line manager and chief technician, Dr Tim Barnes (Ref #1) 3) With regard to stock taking, ordering and auditing of consumables, of my own volition I devised more efficient Excel scripts for calculating monies to recharge and relay that information to personnel in accounts. In addition, to improve accountability, I have elected to put up laminated tallies on fridges and freezers which declare levels of consumables, e.g. *Taq*, *syrbr green* qPCR mix etc. so I can order efficiently and also users are aware of extant levels and can make me aware if they require more or if they take the last units (necessitating re ordering) 4) With regard to provision of recycling (of empty tip boxes etc.), as implied, by phoning the companies to arrange for couriers to collect bags on an *ad hoc* basis 5) **Regarding these activities in my prior position** at the University of Edinburgh the same considerations and practices applied

C: Interpersonal skills: Demonstrate effective communication and interpersonal skills

Competencies	Guidance	Evidence Chosen
C1: demonstrate effective and appropriate communication skills	This means that you can give examples of how you demonstrate effective and appropriate communication using oral, written and electronic means. This may include (but is not limited to) examples of: ▪ discussing and agreeing objectives with your supervisor ▪ discussing and agreeing objectives in team meetings ▪ giving presentations of your work or other aspects of lab work (e.g. safety updates, method updates) to your supervisor and team. ▪ preparing written reports on your work ▪ train, demonstrate or teach others in procedures or protocols	Why: My current position intercalates lab housekeeping duties with personal laboratory project work and also training of students in particular techniques. This is necessary to ensure competent work is performed by myself and other users in the lab; provision of basic materials for such work to be performed on time and on budget; and safe *COSHH* compliant (GLP) working practices are adhered to. The same pertained to my previous position at the University of Edinburgh
		What: • Liasing with PIs regarding project objectives and timetabling of experiments • Liasing with students regarding training in competent, safe practice in particular technical methods • Liasing with lab personnel in general regarding conduct in the lab and GLP

	▪ play a part inn staff development (e.g. carry our appraisals or staff reviews) ▪ carry out induction training	How: • *Power Point* progress reports to PI's at weekly meetings to review data and new experimental objectives • Perusal of technical literature and participation in technical forums e.g. *Research gate,* to solicit best current practice and troubleshooting methodology, relating to such projects • Devising or updating SOPs for students regarding particular techniques, e.g. best practice for extracting RNA from tissues is one I have repeated to multiple students in both my present position and prior position under discussion (and also in many other positions over the last 25 years) • With such SOPs demonstrating to novices best practice for carrying out such techniques, e.g. manual extraction of RNA using Trizol and chloroform – paying particular regard to the safety aspects of this protocol such as working in the fume hood; wearing nitrile gloves, disposing of materials in fume hood based cytotoxic bins • In the case of real time qPCR devising SOPs and then training novice users in their application by demonstrating the set up and running of the *Viia 7* qPCR machine • • **In my prior position** delivering *Power Point* presentations at public lab meetings to solicit comments from other group members and also departmental seminars to solicit comment from a wider audience
C2: demonstrate interpersonal and behavioural skills	This means that you can give an example that demonstrates the skills that enhance your ability to interact with colleagues in the work setting. In these situations it may be appropriate to	Why: In both my current and prior role under scrutiny I deal with various constituent groups, e.g. Specialist technical lab staff; Admin personnel in finance; outside technical and sales representatives and interested members of the public in an 'Outreach capacity'

	discuss these with your supervisor, as an external perspective is often very useful in this regard. Your example should also describe how you ensure your method of communication is appropriate for (but is not limited to): a) interacting with students or trainees face to face b) interacting with other professionals such as researchers, technicians, administrators, and other members of staff c) interacting with external colleagues (such as manufacturers, suppliers, couriers, designers etc.)	What: • Provide detailed technical training to scientific personnel through practical demonstration and technical SOPs • Perform face to face non technical discussions with sales representatives where the object of the exercise is to consider new products in terms of cost, expedient delivery and reliability • Liase with finance staff regarding spending and auditing of the consumables budget I manage • Provide in house admin staff with *ad hoc lab* tours where the primary object is to impart what goes on in a modern cardiovascular research environment, by initially providing background concepts like mutations in DNA and their relevance to disease ('Pitched at the level of a Radio 4 documentary' for example and therefore conducive to the needs of a non-specialist, lay but educated audience) • In a similar vain provide analogous 'Outreach' tours to lay members linked to the BHF, viz. fund raisers and Admin staff to try explain where their money goes !!
		How: As already detailed: • Provide technical literature and training to scientific lab based personnel • Meet on a one to one basis with medical representatives to discuss the financial calculus and thus cost effectiveness of consumable products • Liase with in house financial team members to discuss managements of the consumables budget: Generally, this takes the form of monthly accounting reports supplied as

		Excel spreadsheets and one on one personal meetings to iron out any queries • Conducting personal lab tours with explanation and laminated cartons of genetic concepts, e.g. identifying mutations in genomes and linking that to disease in order to foster symbiosis within the department and provide explanation to lay members of our funding bodies such as the *British Heart Foundation (BHF)*
C3: demonstrate productive working relationships and an ability to resolve problems	This means you should be able to describe how, when working with others, you are able to demonstrate that you developed positive working relationships and resolved conflict. Your example should demonstrate how those working relationships were effective in resolving problems. For example you may: a) be a member of a committee/group that is tasked with a particular safety aspect of the job and be able to demonstrate that together you made a difference that was useful and effective in the work place. b) liaise with other groups within your organisation to effectively deal with problems (e.g. lack of or demand for training in a particular area)	Why: In both my previous role at the University of Edinburgh and my current role in BHF cardiovascular Sciences at the University of Leicester I deal with different constituent groups, e.g. scientific specialists (lab personnel), admin staff outside protagonists, each with their respective and different agendas. Productive & relationships are necessary to perform all aspects of my job description to the best of my ability. This is imperative in my support role to ensure smooth running of the labs on behalf of other lab users and perspicuous costings in relation to finance staff. Part of that remit is addressing different and competing problems to keep everything afloat What: • Communicate regularly with lab staff via e mails and approaching individual users to ensure compliance with *GLP* and try and understand if there are issues relating to lack of compliance • Make sure I participate actively in monthly housekeeping issues to address concerns of other lab users and my own concerns regarding transgressions in terms of *GLP*

	c) be a part of working groups tasked with addressing specific problems or the need for change.	• Make sure I communicate with finance staff on a monthly basis to ensure timely delivery of financial reports for the purposes of recharging • Make sure I provide PIs with spending figures for students and post docs in their group to make them aware of expenditure occurring • Actively participate in monthly lab housekeeping meetings to identify areas of concern, e.g. personnel working with dangerous chemicals at the open bench; supply problems with particular items and minute such discussions for future actions • Communicate for example with our tip supplier (VWR) regarding provision of recycling and any attendant problems, e.g. couriers failing to turn up to pick up point to collect the recycling bags • Communicate with outside technical personal, e.g. analytical equipment engineers to ensure optimal performance and repair of analytical platforms
		How: • Communicate with individual lab users regarding transgressions and GLP, e.g. inappropriate disposal of chemicals; use of hazardous volatile chemicals on the open bench (rather than the fume hood), e.g. organics • Actively provide housekeeping points at lab meetings, e.g. changes in practice such as re organisation of communal stocks in fridges and freezers; aseptic practice in Micro biology; supply problems with particular chemicals; encouraging end users to communicate depleted stocks via a 'Lab matters' board, put up be me, to ensure requisite stocks of essential consumables are maintained

		• In the event for example of particular individuals failing to adhere to GLP, rendering their practices potentially unsafe, schedule a meeting to work through the COSHH form and justify why such measures are needed: For example organics must be used in the fume hood because they are volatile and inhalation of vapour phase might cause harm to them. Thus, the ventilation provided by the fume hood protects them. Similarly, If practice is changed in a lab – insisting that spent agar plates in Micro biology are disposed of in an incinerated bin – Justify that change, i.e. disposal of LB agar plates in general orange bag refuse might lead to break down of the autoclave in the event of seepage and that could personally impact their work. There again I justify my insistence that all agar plates are sealed to prevent contamination which could affect their work; If in doubt appeal to self interest !! • Regarding one particular responsibility, namely arranging for recycling tip boxes, when I take up this position, I quickly identified problems associated with expedient collection; and quite often no collection at all. The problem turned out to be the courier failing to follow instructions regarding correct pick up point (cf. hospital 'estates and services' as opposed to the lobby in the BHF cardiovascular centre). Through a succession of phone calls and e mails to the manufacturer of our tips who outsourced collection to a courier this problem was eventually resolved to the satisfaction of all parties • Regarding one piece of equipment I both personally use in my project work but also manage on behalf of other end users', viz. the *Viia 7 Real time qPCR machine* over the last 18 months in particular we have experienced a series of performance problems and outright cessation of running. This has required communication with laboratory staff to clarify the specifics of problems, e.g. Arrested runs owing to

		temperature sensor detector issues & faulty communication between the instrument console and PC linked running software *inter alia* and then communicating these issues to the engineer. Furthermore, subsequent to resolution of these problems, suggestions have been made by the engineer regarding better operational practices, which have then been incorporated into user SOPs by myself and inculcated to new and existing users' via 'group' e mails and pertinent conversations, making reference to the updated SOPs

D: Professional practice: Apply appropriate theoretical and practical methods

Competencies	Guidance	Evidence Chosen
D1: identify, review and select scientific techniques, procedures and methods to undertake tasks	This means that you can give an example of work that you have undertaken where and why the method/procedure used was chosen as the best (or most relevant) to use. This might include (but is not limited to): a) review of method – why is this one the best compared to others that are available b) cost effectiveness c) time taken	Why: 1) In my current role I not only manage a large multi user molecular genomics lab but also participate in laboratory research: This can be personal participation in bench work or vicarious participation by instruction of novice users' or bench supervision of particular techniques/ data generation & analysis carried out by Ph.D students': • In one example of technical bench supervision it was necessary to stablish a standard operating procedure for measuring gene expression underpinning cardiotoxicity; That is metabolic

	d) IT considerations	changes which help protect cardiac myocytes from injury due to foreign substances 2) In another example from my prior cited position (ref #2) it was necessary to seek advice & trial pilot methods in order to find an optimal method for abundant expedient and cost effective production of a soluble target protein (*rREL1*) utilised in a drug screening program for *HAT*
		What: 1) Devise a procedural pipeline for extraction of RNA from cardiac myocytes & consistently and robustly measure expression of pertinent genes of interest (GOI): • Using real qPCR to quantify such genes, do we elect to use customised & therefore expedient *TaqMan* assays or more technically involved but cheaper and flexible *Sybr Green* qPCR assays ? • Having selected a real time qPCR protocol, how do we go about selecting stably expressed abundant housekeeping genes for normalisation of expression • Regarding IT considerations, what is the best method for quantifying expression between different sample groups (normalised to selected housekeeper genes) 2) Trial methods and devise a standard operating procedure for production of abundant, soluble and active target protein constituting a 'smart' target for

		subsequent development and implementation of a drug discovery assay and drug discovery program
		How: 1) Regarding measuring expression of GOIs conferring protection to cardio toxic agents (and with reference to the 3 seminal question posed in 'what') it became obvious that • *Sybr green* assays although requiring design of primers to GOIs and working up the assay would afford flexibility in terms of where in the cDNA sequence we were able to map the primer sequence: This seemed important in order elucidate if a particular protein isform derived from a particular alternative transcript was responsible for conferring cardio protection to drugs. Moreover, *Taqman* probes, although off the shelf and therefore convenient are expensive compared to simple *sybr* dye labelling of cDNA and with inclusion of panels of housekeeping genes to select the best requisite 2 or 3 for expression analysis, it became evident that significant cost savings could be incurred by choosing to label with *sybr green* • Based on current best practice and *MIQE compliance* it was also evident that we needed to screen a panel of housekeeping genes using programs like *gene Norm* to find the 3 optimal

		housekeepers in the context of our expression system • Finally, from literature perusal, including discussion threads on *Research Gate* and also soliciting answers on Research gate to questions posed I realised that we needed to perform normalisation of gene expression using the *geometric mean* of 2-3 housekeepers and enumerate actual gene expression between different cardiac cells lines using the so called *Delta Delta Ct* method (or *Livak* method). This was carried out in *Excel* and students trained by me in the methodology 2) In my prior position in Edinburgh, it was necessary to devise and implement a standard protocol for production of soluble active recombinant target protein in sufficient quantities to allow implementation of a drug discovery program using a drug screen assay incorporating this protein as a smart target: As detailed in my prior answer using this technical imperative as an example of autonomous work, the solution was basically to precede the expression (In *E Coli BL21 DE3*) with a heat shock – this initiated SOS genes that lick started *in vivo* translation of the recombinant protein in the E Coli host – followed by protracted expression at sub ambient temperatures (18-20^{o}C) for a protracted period (~ 20 hours rather than 1-6 hours); This resulted in protein expression with minimised mis folding and thus a significant soluble fraction that was biologically active: Details can be found in a technical report on my web site summarising this optimisation

D2: contribute to the organisation of tasks and resources	This means that you can give examples of how you have contributed to the running of the laboratory/workshop/section and related areas. For instance this might mean (but is not limited to): ▪ organisation of safety checks and inspections ▪ ordering equipment, software, and materials ▪ organisation of a rota for cleaning, maintenance, or machine time ▪ organisation of human and physical resources when an issue arises ▪ organisation of statutory inspections, external/internal servicing, and maintenance of equipment or infrastructure.	Why: 1) **I currently work** (2015-) in a multi user multi PI lab amounting to about 25 individuals; I am responsible for managing consumable resources, the ordering and organisation of such resources and maintenance and operations of key pieces of equipment as well as managing a consumables budget supplying these consumables: At the outset, it became evident to me that the laboratory required structural re organisation to render operations less complicated and benefit the end users' 2) **In my prior discussed position** at the University of Edinburgh (2008-2012), I arrived at the labs inception and thus was responsible for helping to set up the laboratory What: 1) Completely re organise communal space in multiple lab -20^{o}C & -80^{o}C freezers and numerous fridges. Regarding the former in particular, separating archived materials from current working materials and devoting a single freezer to consumable stock that can therefore be located and quantified (for stock taking and ordering purposes) more efficiently 2) Re organise charging of signed consumables on a monthly basis rather than a quarterly basis so relevant PIs could more effectively manage costings 3) Re organise materials and practice of the microbiology/cloning laboratory to render stock taking more efficient and aseptic technique better

		4) In my prior cited position in Edinburgh, similar considerations pertained
		How: 1) Regarding my current position: • Arranging through the Chief Technician, Dr Tim Barnes, to 'down tools' for 1 day in order to carry out a collective clearing of obsolete stock in fridges and freezers: This liberated space – in part the object of the exercise – enabling streaming of freezers into those for immediate work, linked to current users'; those with archived materials linked to former lab users' (since departed) and a freezer dedicated to stratified consumable stock; therefore easy to find and stock take, enabling timely and seamless ordering (of such consumables). With reference to accountability of this this new order, laminated personal signs with users names' were appended to respective freezers and in the case of the consumables Freezer, a laminated shelving plan was displayed on the outside, including a column with written levels of current stock and a separate notice asking users' to inform me when particular items were depleted to a certain number to enable order and delivery before all such stock runs out.

		All such activities were initiated by myself, with simple consultation and necessary permissions sought from my line manager rather than solutions to such infra structure issues asked for • In a similar way, *Excel* spreadsheets denoting signed out stock were put up and changed on a monthly basis: By then calculating expenditure of particular items by particular individuals - using an excel spreadsheet with costing scripts devised by myself – Pis could then more easily monitor consumables expenditure and manage recharges from their grants 2) With regard to my prior position at the University of Edinburgh, similar considerations applied. However, because I helped set up the lab from its inception, apart from efficient maintenance & utilisation of resources I was also involved in independently tendering quotes on key pieces of equipment from major medical science retailers e.g. *VWR* and *Thermo Fisher.* Added to that I was also responsible at the outset from risk safety management, including *COSHH* forms & safe streaming of waste (complaint with local university edicts)
D3: participate in the design, development and implementation of solutions	This means that you can give an example of 'problem solving' that describes your specific role in helping to overcome a specific problem. For instance it might mean that a process, programme, design, assay, or method suddenly stops working and you are involved in finding out the reason why. Your	Why: 1) In my current role and regarding a particular IHC based research project, a cohort of experimental samples of paraffin fixed formalin embedded (FFPE) tissue (*Microtome*) sections failed to display staining with an antibody to an epitope of *CD 31*; a biomarker of angiogenesis 2) In my current role also, but relating to my lab management responsibilities, certain communal pieces of

	example should show what your role was in understanding the problem and what your contribution achieved.	equipment e.g. *rotor gene* real time qPCR machines are serviced with 'soft monies' taken from grant overheads linked to all lab PIs'. Should PIs using the equipment be responsible for service contracts and not departmental funds derived from all PIs' ?
		What: 1) Find a way to restore *CD31* staining in refractory FFPE tissue cohorts in order to quantify blood vessel formation in experimental and control samples (delivery of drugs by stent versus treatment with a stent in the absence of angiogenic substances) 2) Monitor usage of equipment like rotor genes and ascertain if usage is linked predominantly to particular end users' associated with particular PIs'
		How: 1) I surmised that The pertinent issue with the experimental cohort failing to stain with anti *CD 31* antibody by IHC was ineffective '*antigen retrieval*': In particular fixation had denatured the *CD 31* epitope and standards methods of antigen retrieval had failed to sufficiently renature the antigen, allowing detection by monoclonal antibodies. Having tried various heat and enzymatic methods for antigen retrieval (viz. *Hot citrate* buffer; *Trypsin* digestion & *Proteinase* K digestion at 37^{o}C) sufficient specific antigen retrieval and hence staining was conferred by digestion at 55^{o}C with Proteinase K. My rational for trying this elevated temperature was based on the fact that prior experience had taught me that digestion of protein in samples of

		genomic DNA is more efficient at 55ºC; Would this salient precept carry over to IHC? The answer was a resounding 'yes' as staining at 55ºC was procured sufficiently that new blood vessel formation could now be scored in the experimental cohort !
D4: contribute to continuous performance improvement	This means that you can give an example which shows how you are aware of progress in your area and seek ways of improving the efficiency of your work. It should describe how you seek to discuss with your supervisor the strategy for achieving this. For instance this could include new and improved methods, new ways to increase throughput, or ways to increase cost-effectiveness. Examples might be your role in (but is not limited to): • taking part in staff reviews • working within time frames and using SMART objectives • contributing to operational plans • looking for cheaper resources	Why: 1) In my current role, key pieces of equipment, e.g. the *Rotor gene* real time qPCR machines are communal. However, monies to service these machines are availed from general departmental funds. Should monies come from particular PIs to cover service costs if they dominate usage rather than general 'soft' funding which is taken from the grants (via over heads) from all PIs' ? 2) Part of my remit in my current role is to trial new molecular reagents to improve performance and/or reduce costs and also introduce the same consumables from alternative suppliers, but at a cheaper price 3) The multi user lab I manage as a modern molecular genomics lab has a series of complex analytical platforms e.g. PCR machines, real time PCR machines and gel documentation systems *inter alia*. Establishing and improving protocols for maintenance and use leads to continuous performance improvements in terms of data quality and reliability

	• working within a budget • playing a role in procurement management	What: 1) Implement a system to monitor *rotor gene* usage in order to apportion the monies needed for a service contract based on actual usage, rather than a general PI split 2) Liase with outside technical and product specialists to up ate communal consumables to bring down cost and improve performance 3) Devise and inculcate SOPs and maintenance procedures for analytical instruments in order to ensure consistent high quality data for end users' in the lab and hastle free performance of the instruments themselves
		How: 1) When I arrived in this job, a booking system already existed with regard to rotor gene usage. Obviously that information can be used to quantify usage and relate usage back to particular PI's. Accordingly, I have started to compile records of the booking information in a log book and then on a monthly basis I transpose that information into histogram format in *Excel*, quantifying usage per platform but crucially I also make pie charts showing apportioned usage by particular individuals per month. On a 6 month basis this information is used to compile meta charts that will form the basis in the future for eliciting discussions by PI's regarding contributions made by particular PIs towards the service contract for instrument maintenance and repair 2) Regarding updated consumables I regularly meet with sales specialists to try and reduce costs by sourcing the same product from alternative suppliers. In addition, our current smarter purchasing system allows me to shop

		around when it comes to approved suppliers linked in to *Science warehouse*: This allows me to swap and change continuously when it comes to purchase of common communal consumables like gloves, tips and tubes and pass those savings onto the PI's. A concomitant of this activity is that I compute expenditure using formulas in excel and obviously prices require continuous adjustment in relevant fields to reflect these changes. Another example of this is product evaluation: In particular, I am responsible for PCR genotyping of mice for marker assisted breeding and recently trialled an alternative PCR ready mix from *Appleton Woods.* Not only was this PCR mix cheaper than our then current supplier but also demonstrated improved signal to noise, enabling unambiguous identification of animal genotypes in samples that were hitherto ambiguous, requiring re extraction of genomic DNA and repeat of those subset of PCRs. Indeed the improved signal to noise was such that the company asked me to write an article for their web site in order to show case the merits of their PCR ready reaction mix 3) Since taking up this post 2 ½ years ago I have ensured that key analytical platforms are subject to maintenance procedures which are recorded on a laminated schedule for end users' to take note of. For example, both the *Nanodrop* and *pH meter* are subject to monthly acid washes to prevent build up of residue which might interfere with data output. Similarly, the *Viia 7* PCR machine requires 6 monthly spectral calibration to maximise signal to noise and sensitivity from generated data and this is declared on a laminated

		scheduled sheet. In addition, I have introduced a log system for when the *Viia 7* breaks down and generates error messages which I ask users to write down. I also take a snap shot of those error messages and archive them in a desk top folder. This information is useful for engineers in terms of diagnosing and thus expeditiously resolving technical problems. Finally, the *Viia 7* platform in particular generates large data files and unless these are archived instrument performance is compromised (on account of memory saturation). Thus I insist that all users take away data files on a personal USB stick and weekly data files on board the instrument console are wiped and a self test to identify mechanical running issues is now run at the beginning of every week by me. Finally, data files are also generated on the PC linked to the instrument console. These are periodically archived on a large shared departmental drive which hitherto had not happened; All such measures have been initiated and are promoted by me

E: Professional standards: Demonstrate a personal commitment to professional standards

Competencies	Guidance	Evidence Chosen

E1: comply with relevant codes of conduct and practice	This means that you can give examples of how you: a) comply with the code of professional conduct of the Institute of Science & Technology b) manage work within all relevant legislation, regulatory frameworks such as Healthy and Safety Legislation, Home Office Regulations, Good Laboratory Practice (GLP), local Codes of Practice, data protection etc.	Why: 1) Safe codes of conduct in a modern life sciences research lab are mandated by *HSE* health and safety legislation 2) When I arrived in this position good *GLP* and effective aseptic practice was not being adhered to in our Microbiology/Cloning laboratory
		What: 1) Ensure that lab practice by end users complies with *GLP*, *COSHH* and health and Safety legislation 2) Devise methods structural and procedure to render practice in microbiology more in line with *GLP*
		How: • As already discussed I am responsible for devising *COSHH* forms for any new hazardous chemical: These forms are made available on a shared drive, together with source MSDS forms on a shared drive. In addition, hard copies are availed in ring binders: These are for end users to examine and then sign to say they have understood, viz. PPE, disposal etc. • In addition, I make myself available to train new users in how they should personally go about filling out *COSHH* forms, viz. transposing information from *MSDS* forms to Leicester formatted *COSHH* forms; and also avail myself in terms of answering any queries they might have about how such information relates to actual lab practice. Furthermore, for new users and/or techniques, this might also involve practical technical instruction provided by me • Regarding the cloning microbiology lab since taking up this post I have streamed the un inoculated LB agar plates from inoculated to prevent contamination of virgin plates. In

		addition, all such plates are sealed with parafilm or Saran wrap to prevent cross contamination with spores. Finally, by dating plates users' at my behest are expected to keep plates for no more than 2 months: After this time viability is low or abrogated and such obsolete plates are a source of infection for extant plates. To inculcate this good practice I have taken to placing laminated instructions on each fridge and also expect all new users to undergo an induction in GLP provided by me before commencing work in the room
E2: maintain and enhance competence in own area of practice through professional development activity	This means that you undertake activities to enhance your competence in your own area of practice (PPD – Professional and Personal Development). Your PPD report may be used as evidence for this section, and details of what you need to achieve in terms of PPD are outlined in the PPD section of the website. For your first application for Professional Registration you need to submit a plan of what you expect to undertake in the next 12 months. Note that PPD has to be submitted on an annual basis to maintain your entry on the Professional Register.	Why: 1) It is necessary to update technical skills, acquire new technical skills and also participate in CPD activities to verify that such objectives have been achieved: In my case this is imperative because I am expected to participate in multiple ad hoc research projects, necessitating personal training, and also ensure that lab practice by other users is GLP and HSE compliant: All of this is the subject of my annual appraisal 2) Apart from my lab management role, CPD is necessary to improve promotion prospects within a *(BHF)* well funded and diverse department, where new opportunities might be around the corner
		What: 1) Demonstrate that I continually interact with persons in the department to update my technical skills in order to participate in personal lab based projects as and when needed 2) Be aware of *COSHH* and *HSE* matters in order to prosecute lab management duties effectively and also train novice users in safe and *COSHH* complaint practice 3) Both of these activities require demonstration via an annual appraisal document and extended 'performance' meeting with my line manager

		How: 1) Attend Health and safety courses e.g. regarding *COSHH* 2) Interact with PIs in order to solicit new technical training in order to personally participate in new laboratory projects 3) Discuss and prove the above in the context of an annual appraisal which includes sections on future objectives as well as extant performance set against previous objectives set in the previous annual appraisal: These have included matters under discussion such as lab re organisation to render practice GLP compliant and render stock taking and ordering more accountable and efficient 4) Finally, to validate my conduct, I have in the last 6 months I have solicited and achieved elected membership of various professional societies, e.g. The *Royal Society of Biology (MRSB)*; The *Institute of Science and Technology (MIScT)* and a licentiate member of the *Institute of Biomedical Sciences (LIBMS)*. With particular reference to the IST since elected full membership I have also become a *'Registered Practitioner'* : This is based on satisfying the CPD objectives of the IST; which are re iterated for the purposes of this application for *'Registered Scientist'* 5) Finally, I have series of professional online profiles, e.g. *Orcid, Research ID* and *Academia.edu* which document my experiences skills and publications and are useful resources for completing member ship applications. Furthermore, my public visibility and personal participation in Research gate have led to numerous invitations to join editorial boards of various journals. Consequently and currently I am a review editor for *'Frontiers in Microbiology'.* Such activities assist my technical work but also contribute to CPD in terms of report writing/reviewing skills