RESPONSIBLE RESEARCH IN PRACTICE

Improving Reproducibility Course Overview

Course description: These online courses are intended for Life Science researchers at any stage of their research career who are actively planning, supervising, conducting, reviewing, analysing and/or disseminating *in vivo* or *in vitro* research.

The course is comprised of 8 LIVE online interactive sessions, or 8 ON-DEMAND webinar style tutorial sessions. All are built upon the concept of six simple steps for responsible research:
Session 1: Introduction to the 6 simple steps for responsible research.
Session 2: Step 1 – What is the aim of your research?
Session 3: Step 2 – How to identify the best research model.
Session 4: Step 3 – Understanding your research framework.
Session 5: Step 4 - Common experimental design flaws and how to avoid them.
Session 6: Step 5 - What can you do to improve the research model, method and/or technique?
Session 7: Step 6 - What have you learnt and how can you improve?
Session 8: Current best practice in research dissemination.

Following a brief introduction explaining why everyone has a role to play in promoting responsible research, participants will be introduced to our 6 simple steps for responsible research (RR) checklist. Other relevant freely available tools and resources to support researchers to plan bioscience research in accordance with best practice will also be shared. The next six sessions (2-7) will focus on an individual step within the RR checklist in enough detail, and with illustrative examples to help participants identify and ensure they understand what the implementation of each step means in the context of their own research. During each of these sessions relevant freely available tools and resources to support researchers to meet expectations of best practice will also be signposted. The final session focusses on best practice in the dissemination of research outputs and science communication.

In summary:

Course title	Responsible Research 101
Who for	Bioscience researchers who are actively planning, supervising and/or conducting Bioscience research and want to ensure they conduct their research responsibly (and reproducibly).
Length	12 hours total teaching time (8x 1.5hr interactive live webinars) plus activities for participants to complete in their own time.
Format	Live webinar sessions providing an interactive mix of presentations, individual and group activities, and discussions.
Overall Purpose	1. To raise awareness of all the information, tools, and resources available to support Bioscience researchers to conduct research responsibly.

	2. To support participants to identify what responsible research means to them, and any changes they can make to improve their research conduct.
Key content	1. Theory: • An overview of why the responsible (and reproducible) conduct of Bioscience research is important, plus the role every individual plays in shaping their local research culture. • How the research aim effects the details required at the experimental design and planning stage. • Ways to identify the most appropriate research model, method and/or technique to achieve the research aim. • What the responsible conduct of research means in practice for any given individual and their research project(s). • An overview of common experimental design flaws, how to identify and avoid them. • The benefits of thinking critically, being creative and challenging current thinking to improve the reproducibility and translational value of experimental models, methods and/or techniques. • An introduction to the concept of 'marginal gains' and the 'refinement loop' to incorporate research results and practical lessons learnt into the experimental design and planning process. • How you can increase your research impact through the dissemination of your research outputs in accordance with current best practice. 2. Activities: • Participants will reflect upon the aims of their research and how this effects the information they need to effectively plan and design their experiments. • Participants will have the opportunity to investigate a range of research models, methods and/or techniques and reflect upon which is the most appropriate for their aims. • Participants will be supported to identify their personal research framework and reflect upon what responsible research means to them. • Participants will identify potential sources of bias, confounding factors and uncontrolled variables within their research, and the steps they can take to address these. • Participants will be given the opportunity to reflect upon their research model, methods and/or technique to identify limitations and look for opportunities to make 'marginal gains' or implement 'refinements'. • Participants will review a peer reviewed research paper using a relevant reporting guideline to identify what information is missing and discuss the potential impact this has for reproducibility and interpretation of the results.

Learning outcomes	By the end of this course participants will be able to: • recognise what responsible research means in the context of their own work, and why it is important for the quality, reproducibility and reliability of their research data; • plan their experiments with renewed confidence using a range of tools and resources that are available to support them to design and report their research well; • identify alternative research approaches and opportunities to further improve their research conduct; • reflect upon their research impact and the contribution they make to the research culture within the scientific communities they are a member of (local, national, international).
Course provider ***Course Tutor***	Responsible Research in Practice Nikki Osborne
Max no. of attendees	LIVE – 10, ON-DEMAND - unlimited
Specifications	This workshop can be tailored to specific institutional, research funder(s), scientific Society or discipline specific requirements