

Open science tools in animal research – advancing research transparency and quality

	OPEN SCIENCE PRACTICE	SPECIFIC TOOLS	CORRESPONDING LINKS
PLANNING	Guidelines	PREPARE Guidelines	https://norecopa.no/prepare
		UKRN Primers	https://www.ukrn.org/primers/
		ARRIVE Guidelines	https://arriveguidelines.org/
	Design your study thoroughly	Literature and tools for the integration of sex and gender in research	https://cihr-irsc.gc.ca/e/50836.html
		Sample size calculator G*Power	https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower
		Software package for R for the statistical planning for animal research	https://invivostat.co.uk
		Tool for the randomization for experimental planning	https://www.randomizer.org/
		Creating a sharable scheme with the Experimental Design Assistant (EDA)	https://eda.nc3rs.org.uk/
	Preregistration	Preclinicaltrials.eu	https://www.preclinicaltrials.eu/
		Animalstudyregistry.org	https://www.animalstudyregistry.org
		OSF Registry	https://osf.io/registries
		List of journals offering registered reports	https://www.cos.io/initiatives/registered-reports
Writing a research data management plan	Research data management checklist from the Harvard Medical School	https://datamanagement.hms.harvard.edu/plan-design	
	Research data management toolkit from JISC	https://www.jisc.ac.uk/full-guide/rdm-toolkit	
	DMPTool	https://dmptool.org/	
	DMPonline	https://dmponline.dcc.ac.uk/	
Writing a non-technical summary	Alures: the Europe-wide NTS database	https://webgate.ec.europa.eu/envdataportal/web/resources/alures/submission/nts/list	
	Guide to writing non-technical summaries from UAR	https://concordatopenness.org.uk/guide-to-writing-non-technical-summaries	
CONDUCTING EXPERIMENTS	Using an electronic lab notebook	Table of ELNs with features	https://zenodo.org/record/4723753
	Sharing protocols	Protocols.io	https://www.protocols.io/
		Protocol exchange	https://protocolexchange.researchsquare.com/
		Bio-protocol	https://bio-protocol.org/Default.aspx
	Reporting critical incidents	Critical incident reporting CIRS-LAS	https://www.cirs-las.de/home
	Sharing animals, organs and tissue	Online sharing platform for organs and tissues	www.animatch.eu
	Searchable online data base of mouse strain resources from multiple repositories	http://www.findmice.org/index	
ANALYSIS	Writing transparent code	Jupyter Notebooks	https://jupyter.org/
		GitHub	https://github.com/
		R	https://www.r-project.org/

Choosing transparent data visualization	Paper with a list of free tools for more transparent data visualization https://www.ahajournals.org/doi/epub/10.1161/CIRCULATIONAHA.118.037777 Tool to check graph accessibility for color blind persons https://colororacle.org/index.html
Adopting the FAIR data principles	A guide on how to implement the FAIR data principles https://www.go-fair.org/how-to-go-fair/
Using field specific reporting guidelines	ARRIVE Guidelines https://arriveguidelines.org/ Tool from the EQUATOR Network to find specific reporting guidelines https://www.equator-network.org/reporting-guidelines/ MERIDIAN – collection of all reporting guidelines involving animals https://meridian.cvm.iastate.edu/
Using persistent identifiers	Unmistakably identify publications: Digital Object Identifier (DOI) https://www.doi.org/ Unmistakably identify authors: ORCID-ID https://orcid.org/ Unmistakably identify resources: Research Resource Identifiers (RRID) https://scicrunch.org/resources Unmistakably identify mouse lines: The Mouse Genome Informatics (MGI) http://www.informatics.jax.org/mgihome/nomen/index.shtml
Publishing preprints	Searchable database of preprint servers https://asapbio.org/preprint-servers BioRxiv https://www.biorxiv.org/ MedRxiv https://www.medrxiv.org/ OSF preprints https://osf.io/preprints/
Publishing negative results	fiddle- file drawer data liberation effort to identify a way of publication for null results https://s-quest.bihealth.org/fiddle/
Publishing open access	Journals listed by the Directory of Open Access Journals (DOAJ) https://doaj.org/ Gold Open Access: List of open access biomedical journals https://s-quest.bihealth.org/OAPositiveList/ Green Open Access: List of open Access repositories OpenDOAR : https://v2.sherpa.ac.uk/cgi/search/repository/advanced Find open access policies of journals and publishers: Sherpa Romeo https://v2.sherpa.ac.uk/romeo/search.html
Depositing code and data in public repositories	Finding a research field specific repository: https://www.re3data.org/browse/by-subject/ https://beta.fairsharing.org/ Open Science Framework https://osf.io/ Figshare https://figshare.com/ Dryad https://datadryad.org/stash Zenodo https://zenodo.org/
Attributing creative commons licenses	Attributing the adequate creative commons license https://creativecommons.org/choose/
Publishing and connecting all outcomes	Open Science Framework https://osf.io/
Communicating research	Twitter https://twitter.com/ ResearchGate https://www.researchgate.net/