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

	OPEN SCIENCE PRACTICE	LINKS TO SPECIFIC TOOLS
PLANNING	Guidelines	PREPARE Guidelines https://norecopa.no/prepare ARRIVE Guidelines https://arriveguidelines.org/
	Creating a sharable scheme of the study design	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 Schoolhttps://datamanagement.hms.harvard.edu/plan-design DMPTool https://dmptool.org/ DMPonline https://dmponline.dcc.ac.uk/
	Writing a Non-technical summary	Alures: the European-wide NTS database https://webgate.ec.europa.eu/envdataportal/web/resources/alures/submission/nts/list
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

PUBLICATION	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/
	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	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
	Depositing code and data in public repositories	Finding a research field specific repository: https://www.re3data.org/browse/by-subject/ https://beta.fairsharing.org/ General research repositories 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/