



Institute of Primate Research

STANDARD OPERATING PROCEDURE (SOP) DOCUMENT

Development and validation of computational tools

SOP No.	Issue Number	Issue Date	Revision Status	Revision Date
SOP/KIPRE/RPD/DSAS/3.1.76	Version 01	October 2025	-	-

Approvals

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1. PURPOSE

To provide a framework for developing, validating, and maintaining computational tools (algorithms, software, machine learning models) used in DS&AS research.

2. SCOPE

Applies to all in-house developed computational tools and custom modifications of open-source software used in genomics, proteomics, epidemiology, and predictive modelling.

3. PERSONS RESPONSIBLE:

- **Computational Biologist / Data Scientist:** Leads tool development.
- **Software Engineer / Data Engineer:** Supports coding, optimization, and deployment.
- **Head of DS&AS:** Approves final tool release and validation.

4. FREQUENCY

- Validation required **before deployment**.
- Re-validation upon **major updates** or **methodological changes**.

5. MATERIALS

- Coding platforms (Python, R, C++, Java).
- Version control (Git/GitHub/GitLab).
- Test datasets and benchmarking standards.
- Continuous integration (CI/CD) tools.

6. PROCEDURE

1. **Development:** Build prototype tools following reproducible coding practices.
2. **Testing:** Evaluate tools against benchmark datasets; check for accuracy, efficiency, and reproducibility.
3. **Validation:** Conduct peer-review within DS&AS and document performance metrics.
4. **Deployment:** Release tool internally (or open-source if applicable) with user manuals.
5. **Maintenance:** Monitor usage, collect bug reports, and implement updates via version control.
6. **Archiving:** Document all versions, validation results, and change logs.

7. REFERENCES