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Biodiversity for Life

South African National Biodiversity Institute



# Lab work flow & design

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# Setting up a forensic genetics laboratory

To ensure effectiveness of laboratory functions and quality results, the physical lab design should:

- Ensure the **security** and the confidentiality of laboratory operations
  - **Prevent contamination** of exhibits
- Ensure the security, **health and safety** of the staff working in the laboratory
- Facilitate the **flow of evidence** from receipt in the laboratory to analysis and disposal/return to the client.

# Setting up a forensics genetics laboratory

The **ISO/IEC Standard 17025** outline general laboratory requirements;

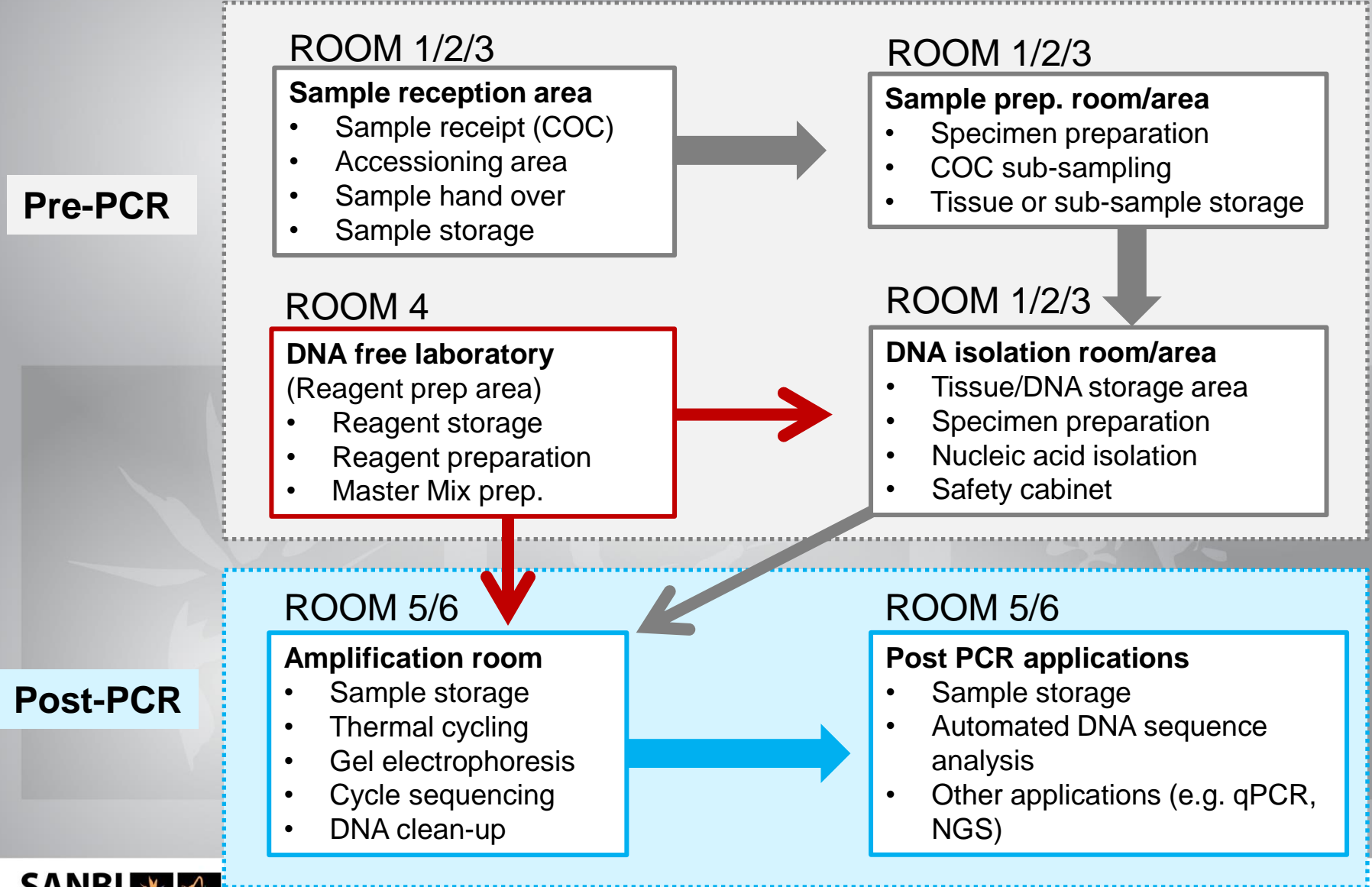
- Facilities must be appropriate for the tests being performed
- Lab environmental conditions must not invalidate results or adversely affect the required quality of all measurements.
- For example: Specific considerations must be given to environmental factors such as:
  - Biological sterility (fume hoods)
  - Lighting (when UV light is used)
  - Access control (logs)
- DNA analysis labs require a clean facility separate from other DNA activities

# Functional requirements

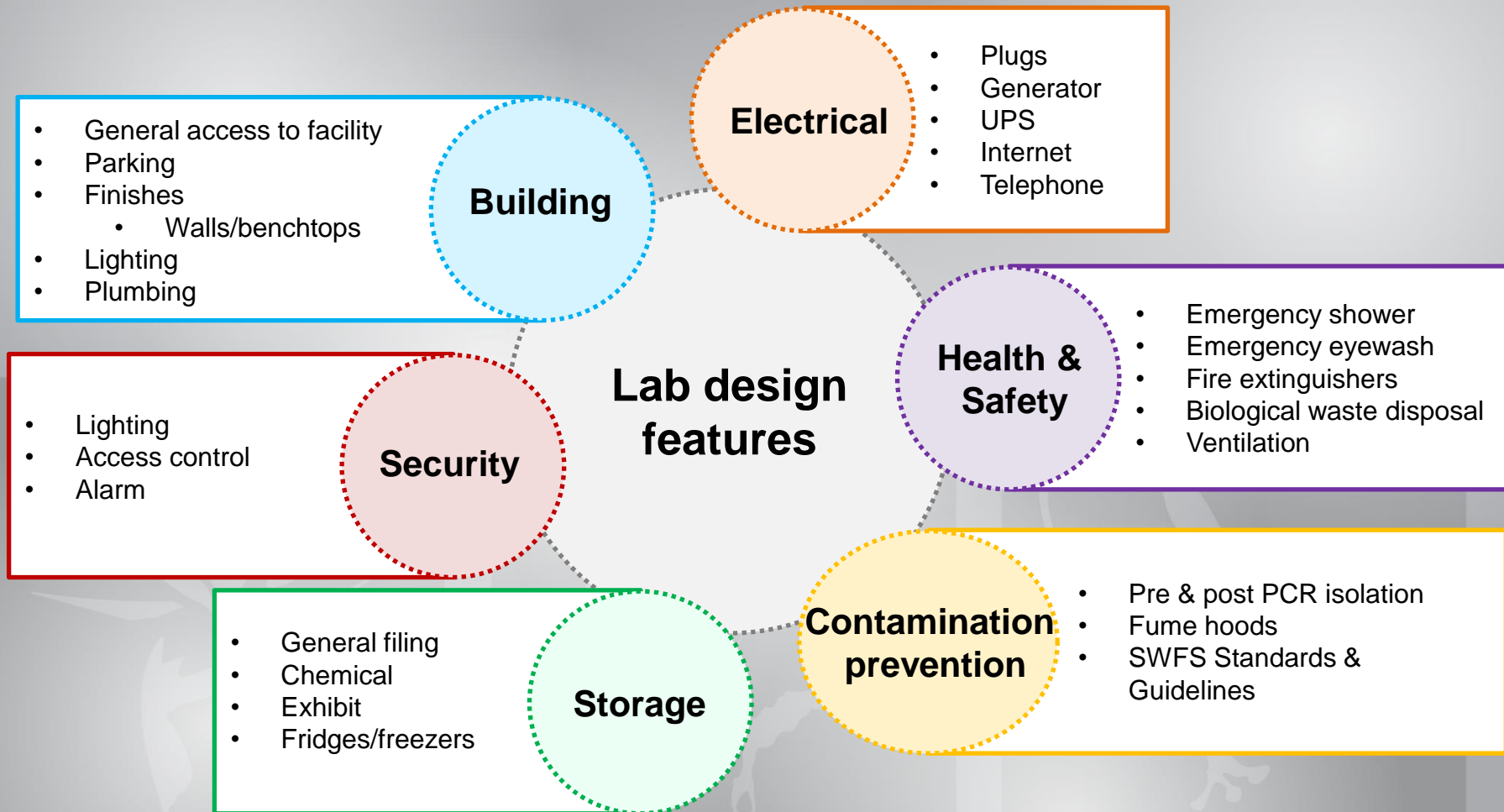
- 1) Physical or spatial separation** of pre- and post-amplification work spaces (preferably, at a substantial distance from each other).
  - Pre-PCR: all procedures prior to thermal cycling
  - post-PCR: Downstream and/or including thermal cycling
- 2) Unidirectional Flow** – Personnel and specimens must flow in one direction
- 3) Quality Management System (QMS):** to promote effective quality assurance. Must account for personnel training, document control and chain of custody, transfer, analysis & disposition of exhibits

- A minimum of the three distinct laboratory areas required for basic PCR are required, arrangement will depend on available infrastructural resources
  - **Area 1** – Reagent preparation (master mixes)
  - **Area 2** – Specimen/control preparation, PCR set-up
  - **Area 3** – Amplification/product detection

# General layout of a unidirectional flow laboratory space associated with forensic services



# Principles of lab design



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***Thank You***