Biosafety in medical laboratories

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Biosafety is the prevention of large-scale loss of biological integrity, focusing both on ecology and human health. These prevention mechanisms include conduction of regular reviews of the biosafety in laboratory settings, as well as strict guidelines to follow. Biosafety is used to protect us from harmful incidents. High security facilities are necessary when working with synthetic biology as there are possibilities of bioterrorism acts or release of harmful chemicals and or organisms into the environment. A complete understanding of experimental risks associated with synthetic biology is helping to enforce the knowledge and effectiveness of biosafety.

Risks in medical laboratories:

- Risk Group 1: Agents not associated with disease in healthy adult humans.

- Risk Group 2: Agents associated with human disease that is rarely serious and for which preventive or therapeutic interventions are often not available.

- Risk Group 3: Agents associated with serious or lethal human disease for which preventive or therapeutic interventions may be available (high individual risk but low community risk

- Risk Group 4: Agents likely to cause serious or lethal human disease for which preventive or therapeutic interventions are not usually available (high individual risk and high community risk).

Laboratory Practices and Technique

The most important element of containment is strict adherence to standard microbiological practices and techniques. Persons working with infectious agents or potentially infected materials must be aware of potential hazards, and must be trained and proficient in the practices and techniques required for handling such material safely. The director or person in charge of the laboratory is responsible for providing or arranging the appropriate training of personnel.

Each laboratory should develop or adopt a biosafety or operations manual that identifies the hazards that will or may be encountered, and that specifies practices and procedures designed to minimize or eliminate exposures to these hazards. Personnel should be advised of special hazards and should be required to read and follow the required practices and procedures. A scientist, trained and knowledgeable in appropriate laboratory techniques, safety procedures, and hazards associated with handling infectious agents must be responsible for the conduct of work with any infectious agents or materials. This individual should consult with biosafety or other health and safety professionals with regard to risk assessment.

When standard laboratory practices are not sufficient to control the hazards associated with a particular agent or laboratory procedure, additional measures may be needed. The laboratory director is responsible for selecting additional safety practices, which must be in keeping with the hazards associated with the agent or procedure. Appropriate facility design and engineering features, safety equipment, and management practices must supplement laboratory personnel, safety practices, and technique.