

Managing laser safety risks for a home-built super-resolution microscope in a multi-user facility

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Maintaining a safe workplace is an important component of research facility management. In a multi-user microscope core facility, instruments are often supplied by the manufacturer as turnkey systems with engineered safety features in place. In contrast, bespoke microscopes assembled in-house from individual component parts are generally configured with demanding imaging methods as the foremost requirement, whereas safety is often managed by restricting access to highly trained specialists. At CMRI, a super-resolution microscope was built in-house on an optical table with two un-enclosed lasers, which have both beam-related and non-beam-related safety hazards. While the microscope is safe to be used, a high degree of user knowledge and complex safe working procedures are required. These impede the accessibility of the techniques to new users in a facility environment. A challenge at our institute is to widen the availability of this system to novice users while controlling the laser-based hazards inherent in the system and maintaining a safe workplace. We will present our progress in meeting this challenge for this microscope, which includes hazard identification, risk assessment, control measure evaluation, control measure implementation and user safety training. This process and the implemented safety measures will make the system safer for users and are applicable to managing safety risks for similar microscope systems.