

## Optic Laboratory

The core of the research infrastructure and part of the teaching infrastructure (Biomedicine & Biotechnology) is the optic laboratory of our department. In the teaching lab, the students get a practical introduction into the field of biologically effective radiation and radiation protection. Among the subjects are the discrimination between types of emitters, use of devices for the measurement of radiation and experiments regarding the biological effects with regards to oxidation (skin aging, stress) and pigmentation by means of biomarkers.

Our lab is equipped for research on spectral characterisation of radiation emitters in the UV and visible range, and their biological and medicinal effects. Two research projects with the AWWARF (American Water Works Association Research Funds) were undertaken in the recent past (deactivating effects of UV radiation on microorganisms, depending on various parameters). Our lab is currently the only independent one in the German-speaking world where the special characterisations of emitters necessary for the disinfection of drinking water in particular can be done. Just recently, the lab got approved as an inspection laboratory by the DVGW, the German Association for the Gas and Water Sector. Additionally, the lab is equipped for the characterisation of UV measuring devices (angle dependence, temperature sensitivity, spectral sensitivity etc.). The resulting multidimensional calibration matrices are a necessary prerequisite for the measurement of biologically effective UV radiation. This is the basis for research projects on the determination of UV exposure (e.g. ICEPURE, SVB). A research project of the AWWARF was undertaken in the recent past as well. Focal topics are mostly instruments for the measurement of the deactivation effect on microorganisms (e.g. the disinfection of drinking water), the measurements of erythema (also as a surrogate for skin cancer with or without melanoma), for the measurement of pigmentation and radiation effective with regards to vitamin D. Methods for the characterisation of radiation sources and measuring devices which were developed in the optic lab became also part of the Austrian norms ÖNORM M 5873-1, M 5873-2, and M 5890 as well as the German norms DVGW W 294-2 and W 294-3. These norms, in term, are also accepted in most European countries and by the Environmental Protection Agency of the USA.