

SRUPE-DS Spectrally Resolved Ultraweak Photon Emission Detection System



Exclusive Applications:

- **in-vivo Chemiluminescence¹**
Radiation Decay Kinetics after Excitation of Human Skin (e.g. Irradiation-, Tribo- or chemically induced)
- **Efficacy Testing of Active Ingredients²**
- **Non-Destructive Hair Analysis**
e.g. peroxidative hair damage³
- **Toxicity Tests**
- **Fundamental Research in Dermatology**
- **Food Quality Tests**

SRUPE-DS is designed to detect ultraweak photon emission from a surface. In most applications the sample surface is human skin, e.g. in-vivo efficacy testing in the field of cosmetic and medicine.

SRUPE-DS can be used not only for today's but also for future research projects. You can discover unknown research areas. The modular construction of **SRUPE-DS** offers an application-oriented configuration of the system.

The efficient optical coupling transfers up to one out of thirty sample emitted photons to the detector (Large Cathode Photomultiplier). An optional six-segment filterwheel can be used either for spectral resolution or for enhancing the SNR by chopping the signal. The measurement procedure including excitation and simultaneous acquisition of up to six data curves with one measurement is fully programmable with easy-to-use Windows software. The special cut filters available include all major Schott Color Glass types.

- **Highly Sensitive Spectrally Resolving Optical Detection System**
- **Up to six Data Curves with one Measurement**
- **High Optical Coupling**
- **Low Dark Current**
- **Easy-to-use Windows-Software**

Standard SRUPE-DS consists of:

- **SRUPE** measurement device (see image)
- **SRUPE-DS** Controller
- 300 W excitation lamp **FXS-300**
- filter batch
- PC with Acquisition-Software & Interface
- Ultrastable-3-Hinge-Floor-Stand (see image)

sensitivity	typ. 2.5 % of the incident light is detected
max. sample area	4.5 cm ²
optically collected solid angle	2.86 sr, equals 45 % of half space over sample area
spectral range (VIS)	250 to 650 nm (QEmax @ 420 nm)
spectral range (VIS/NIR)	250 to 900 nm (QEmax @ 490 nm)
noise equivalent power	4.7 aW typ. for VIS-PMT
dark counts	10 cps typ. for VIS-PMT
max. count rate	4 Mcps
min. integration time	1 ms

Subject to local technical requirements may vary

Studies using in-vivo chemoluminescence measurement technique:

- K. Gunther: *Biochemistry of cellular radiation reactions. An indication for ongoing protective mechanisms against oxidative cell damage.* Naturwissenschaften, 77 (1990), p 412-420.
- H. J. Niggli: *Artificial sunlight irradiation induces ultraweak photon emission in human skin fibroblasts.* J.Photochem. Photobiol. B., 18 (1993), p 281-285.
- W. P. Mei, D. Salter, G. Sauermann, U. Hoppe (1996): *Ultraweak Photon Emission (UPE)- A New in vivo Method for Skin Research.* 2nd International Conference on Clinical Chemiluminescence, Berlin, Germany (Abstract) P-19A
- F. Stäb, R. Keyhani, J. Hansen, G. Sauermann, H. Steinhart, W. P. Mei, U. Hoppe (1996): *In vivo and ex vivo methods for the quantitative evaluation of the antioxidant status of human skin.* 2nd International Conference on Clinical Chemiluminescence, Berlin, Germany (Abstract) P-20A
- W. P. Mei, D. Salter, G. Sauermann, U. Hoppe (1996): *Indication of a "Blue Light Effect" in Human Skin in vivo.* 12 th International Congress on Photobiology, Vienna, Austria, September 1-6, 1996.
- W. P. Mei, D. Salter, G. Sauermann, U. Hoppe: *A New Measurement Procedure to Assess Skin Stimulation by Rubbing.* 20 th Congress of the IFSCC, 14-18 September 1998, Cannes, France.
- G. Sauermann, W. P. Mei, U. Hoppe, F. Stäb: *Ultraweak Photon Emission of Human Skin in vivo – Influence of topically applied antioxidants on human skins.* Oxidants & Antioxidants, Part B, Methods in Enzymology, Volume 300 (1999), p 419-428
- W. P. Mei, R. Hagens, I. Vogel: *Investigation of oxidative stress on human skin in vivo using ultraweak photon emission detecting technique.* 8 th Congress of European Society for Photobiology, Granada, Spain, 3-8 September 1999 (Abstract, p 110)
- S. Benard, M. Rohr, A. Schrader: *Biophotonics - a new field in efficacy testing. UV-protection of skin and hair monitored by ICL-S and ICL-H.* SÖWF-Journal, Volume 6 (2002), p 40-45