

Final Report Summary Multi-grating Irradiation Monochromator



Gilden Photonics Ltd

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Gilden Photonics Ltd is a new company (June 2005) which was formed to exploit the spectroscopic instrument markets on a retail and OEM basis. This project brings together Gilden Photonics with the Photobiology Unit in Ninewells Hospital and Medical School, Dundee. The Unit has an international reputation for testing patients with light-sensitive skin disorders; to support this, it maintains a UKAS-accredited optical calibration laboratory.

Patients who are referred for investigation and volunteers undergoing drug photosensitivity studies are currently tested by exposure of test sites to UV and visible radiation. The ability to perform these tests is severely limited by the low levels of light delivered to the skin. We would like to develop a new multi-grating irradiation monochromator that will deliver high radiative power in UVB (280-315nm), UVA (315-400nm) and visible (400-700nm) regions of the spectrum.

The purpose of the project was to develop a prototype device, which will incorporate a small arc xenon arc lamp with reflector and focusing optics to match a multi-grating monochromator which will be software-driven to enable the user to select the best combination of grating, filters and slit widths. The prototype device will be assessed by measurement of its output (irradiance, bandwidth, beam homogeneity) with a view to later studies on patients.

The project has successfully delivered a design of an optical instrument with construction of a prototype device. It is anticipated that we will be able to take this forward to develop this into a fully patient-compatible instrument that will be extremely useful for clinical investigations. Software development is also at an advanced state so that the ideal of a truly 'turn key' device will be available to the end-user.

It is anticipated that this project will lead to further fruitful collaborative ventures. The Photobiology Unit has need of a wide range of light sources, both fixed and portable, for diagnostic and therapeutic applications. These are all areas where Gilden Photonics would be well placed to develop new products that would be useful not only in Scotland but throughout the world where similar treatments and investigations are performed.

The demand for drug phototesting is increasing due to pressure from the regulatory authorities. The Photobiology Unit performs drug phototesting for many major pharmaceutical companies and is used as a reference laboratory by the FDA. This attracts substantial funding to Scotland but it is recognised that to maintain its international reputation it needs to constantly update its technological base. This project has been very beneficial in this respect.

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