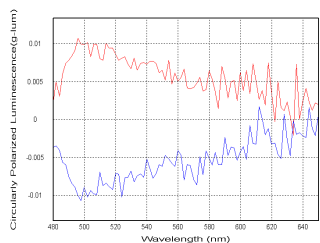
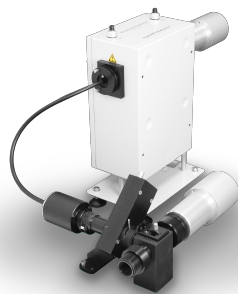


Chirascan Circularly Polarized Luminescence Accessory

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Introduction

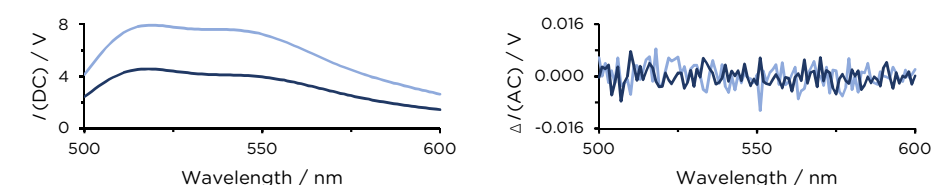
Circularly Polarized Luminescence (CPL) provides information about the excited states of chiral molecules and finds use from materials physics to biology. Particularly, CPL is indispensable for the characterization of lanthanide complexes as molecular probes and in liquid crystals, and of pharmaceutical compounds such as polycyclic aromatics with application as anticancer drugs.



The Chirascan™ CPL Accessory allows the detection of weak CPL signals (g_{lum}) in the order of 10^{-2} at a typical Root Mean Square noise of 0.0014.

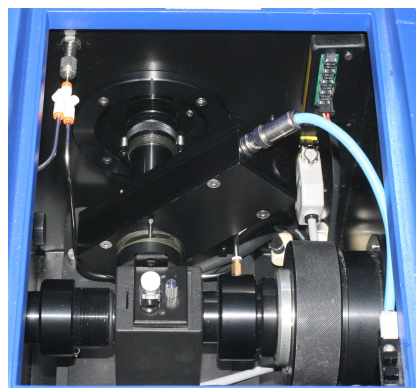
As the excitation beam is polarized horizontally and the emission polarizer is aligned vertically, the set-up with its 90 degree geometry eliminates photoselection artifacts.

Fluorescein in solvents of different viscosity (methanol and glycerine) was used to demonstrate the absence of photoselection artifacts in the ΔI /profile that might arise from fluorescence polarization (FP: 0.014 and 0.424).



Chirascan CPL Accessory *in situ*

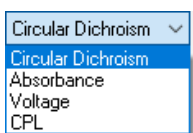
The CPL accessory is used with the standard temperature-controlled Single Cell Peltier Holder and easily replaced to install other accessories.



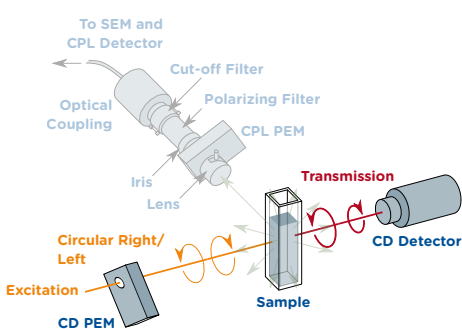
- **Focusing lens and iris** control light throughput
- **Cut-off filter** removes excitation light
- **SEM** selects emission wavelength and bandwidth

CPL and CD with the Same Setup

CPL is compatible with standard CD measurements. Signal modes are easily switched through a drop-down menu in the software for automatic selection of correct PEM, requiring no hardware changes.

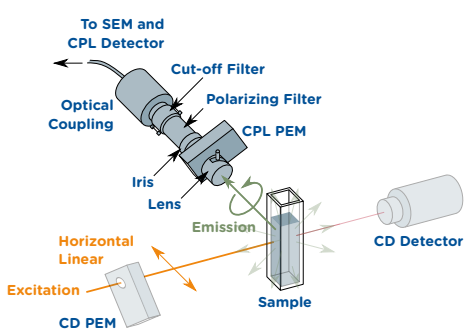


CD Mode



CD PEM: produces circularly polarized light
CPL PEM: inactive

CPL Mode

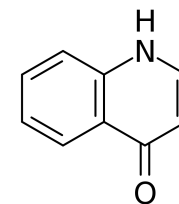


CD PEM: inactive, produces horizontal linear polarized light
CPL PEM: analyses emitted circularly polarized light

Case Study: Characterization of Quinolone Cycles

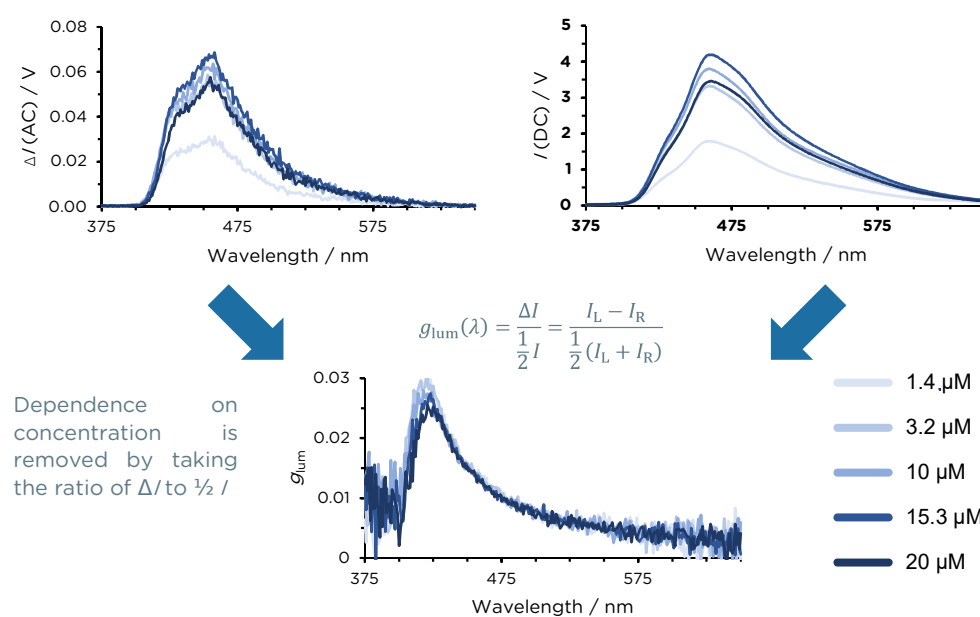
Quinolone antibiotics are often used to treat genitourinary infections. A polymer consisting of quinolone cycles with the bicyclic core structure of 4-quinolone connected by amide bonds (Molecular formula: $C_{472}H_{476}N_{66}O_{68}$, Molecular weight: 8605.89 Da) was analysed with a Chirascan V100™. Polymer samples at different concentrations in dichloromethane were analysed in a 1 cm pathlength cuvette.

Setting	Value
Excitation Wavelength	310 nm
Excitation Bandwidth	15 nm
Emission Range	375-650 nm
Emission Bandwidth	15 nm
Time-per-point	2 s
Step	1 nm
Repeats	5
Temperature	20°C

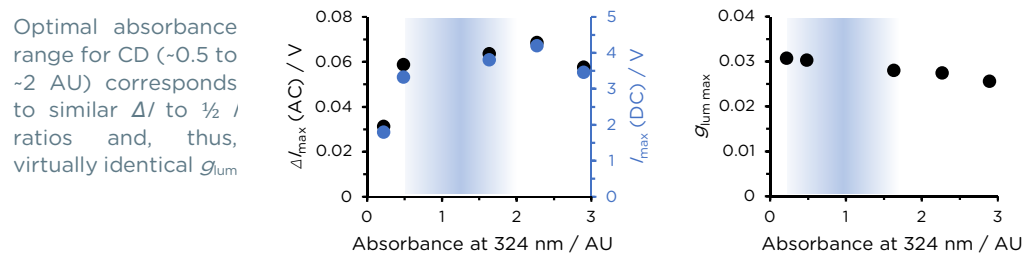
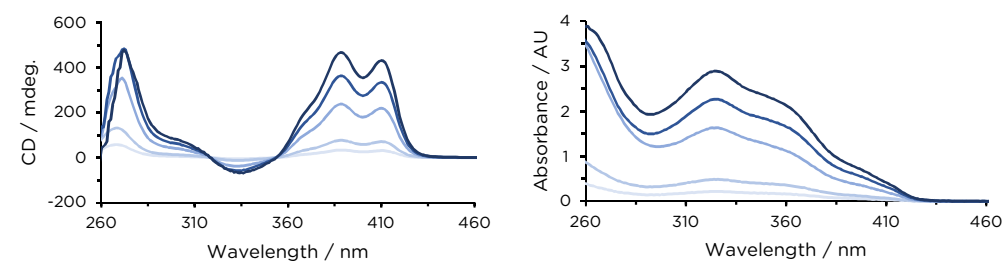


Results

CPL Analysis



CD and Absorbance Analysis



Identical g_{lum} obtained for wide range of sample concentrations.

→ Measurements can be optimized for CD so that both CD and CPL data can be obtained for the same sample.

Conclusions

Chirascan CPL Accessory enables comprehensive analysis of chiral luminophores and is compatible with CD measurements.

- **CPL and CD measurements with same setup and sample**
- **Multiple ways for optimizing light throughput**
- **Full software integration for easy acquisition**