*Monitoring cell cycle by IR microspectroscopy*

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For the in vivo spectroscopic methods of diagnosis and the cell cycle analysis the detection of spectral changes during a cell's division cycle in live cells is of prime importance.

The cell cycle is defined as the interval between the completion of mitosis of the parent cell, and the completion of mitosis in one or both of the daughter cells. It is divided into four main phases: G1, S, G2 and M, where each phase has a particular function.

HeLa cells (cell line CCL – 2, ATCC) were grown inside 12 μm deep well of $CaF_2$ liquid cell (Biotools, Inc.) at $37^0$ in a 5% $CO_2$ atmosphere in minimum essential Eagle's medium (ATCC) supplemented with 10% (v/v) fetal bovine serum (ATCC). The liquid cell used for spectroscopic measurements was assembled by placing a 2 mm thick $CaF_2$ window on top of Biotool's cell and sealing the whole setup in a custom made temperature control jacket.

A PerkinElmer Spectrum One – Spotlight 300 FTIR microspectrometer (Perkin – Elmer) was used for transmission measurements. Spectra were collected in point mode using various aperture sizes to accommodate the different cell sizes.

We demonstrate that it is possible and feasible to collect spectral data and monitor the cell cycle in an aqueous environment.