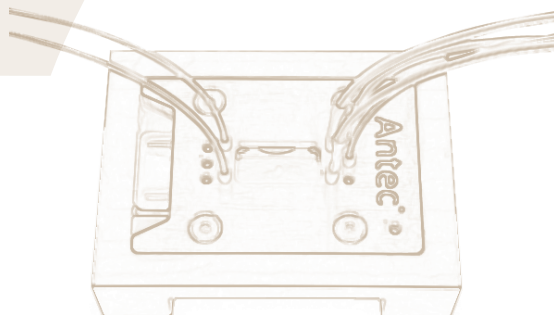
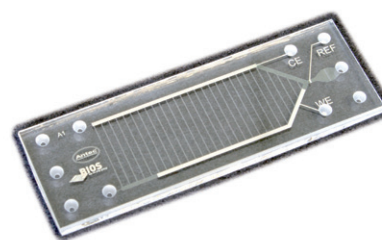




ChipCell™

Nano Flow Applications

- Nanoliter volume reactor cell (approx. 175 nL)
- Ideal for small flow rate applications such as Capillary LC, Nano LC, etc.
- Easy handling
- All parts provided for immediate use



The ChipCell is a specially designed reactor cell with very low volume (approx. 175 nL). It is ideal for small volume applications and is typically used with flow rates in the range of 0.5 – 2.5 $\mu\text{L}/\text{min}$. The cell is made by a micromachining process, whereby a glass substrate is selectively etched to produce the desired channel structures [1].

The cell can be used in direct infusion mode with nano ESI/MS detection. Since the dead-volume free assembly assures the preservation of the chromatographic separation, the cell can also be used after a Capillary- or Nano LC separation to provide on-line CapillaryLC/ Electrochemistry/ MS.

The chip is made of borosilicate glass with platinum (Pt) working, reference and counter electrodes. For optimal protection, the glass chip is delivered in a protective polymer cartridge of 75 x 25 mm, fully compatible with the ChipCell docking station.

[1] developed in collaboration with Dr. M. Odijk, BIOS-group, MESA+, University of Twente, The Netherlands

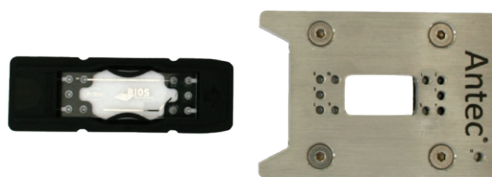


ChipCell in Protective Polymer Cartridge (Black)



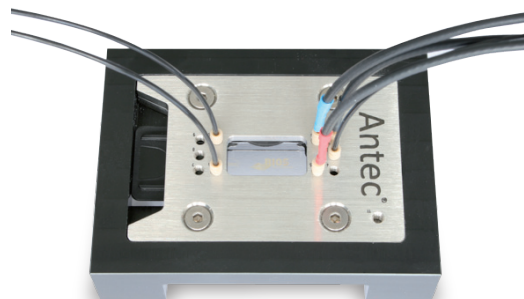
ChipCell in Docking Station

For easy handling the ChipCell is inserted into a stainless steel docking station containing ports for all fluidic and electric connections

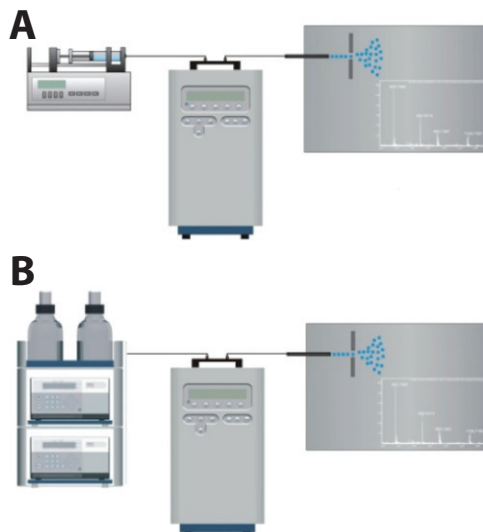


Docking Station in Black Frame

Docking station inserted in black frame with all electric and fluidic connections. Fluidic connections are standard 1/16" PEEKSil tubing (25 or 100 μm ID).



Schematics ChipCell Set-up



Schematics ChipCell set-up with ChipCell assembly on top of ROXY Potentiostat: Direct infusion mode for detection by nano ESI/MS (A) and post-column separation mode, i.e., Nano LC/EC/MS mode (B), typical flow rates 0.5 to 2.5 uL/min.



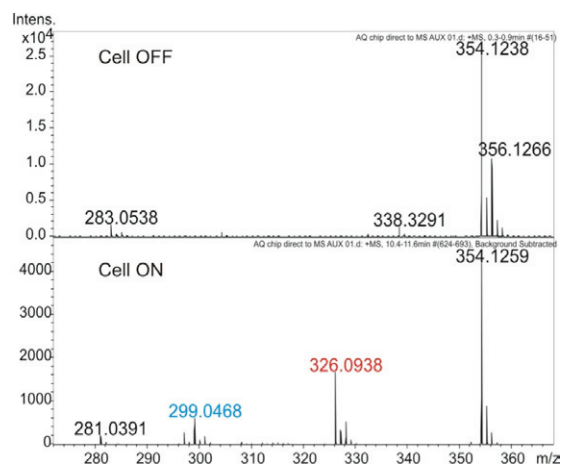
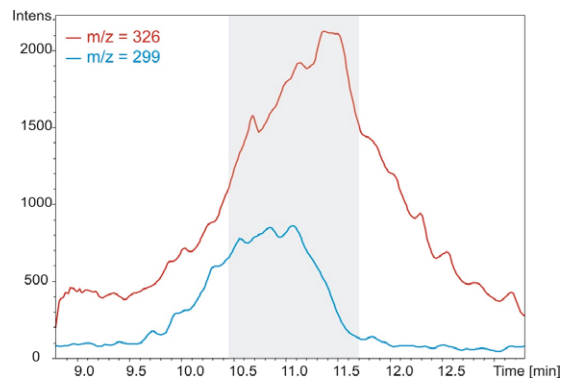


The ChipCell is based on a 3 electrode thin-layer flow cell concept, with a "Y" shape, comprising of one inlet port and two outlet ports with separated working (WE) and counter electrode (CE) in each of the channel arms. The reference electrode is located in close proximity to the inlet. The smooth surface of the working electrode (WE) integrated in one of the channel arms results in virtually zero sample adsorption and carry over. The outlet of the WE channel is connected to the nano ESI/MS, meanwhile the outlet of the CE channel (opposite channel arm) is usually diverted to waste. The glass chip is designed as a disposable component and can be easily replaced once it gets irreversibly clogged or damaged.

Oxidative Metabolism of Amodiaquine

Oxidative metabolism of Amodiaquine (m/z 355) with the two major metabolite m/z 326 and m/z 299 using the ChipCell, scan mode 0 - 2.0V; 20mV/s; flow rate through working electrode channel (WE) ca. 500 nL/min.

The ChipCell is used with the ROXY Potentiostat and for direct infusion mode it is supplied with the appropriate syringe pump. For additional details, see the description of the ROXY EC system. The flow rate and working potential can be optimized using the Dialogue software or dedicated MS software, e.g., XCalibur.





Ordering Information ChipCell™

Part no	Description
205.0035	ChipCell kit, consisting of three ChipCells in protective cartridges, ChipCell docking station + frame and electrical connections to the ROXY Potentiostat Not included is the 1/16" PEEKSIL connection kit, see ordering information below
205.0150	100 µm ID , 1/16" PEEKSIL connection kit, consisting of all tubing, nuts and ferrules for connecting to the docking station, recommended for infusion mode EC/MS
205.0152	25 µm ID , 1/16" PEEKSIL connection kit, consisting of all tubing, nuts and ferrules for connecting to the docking station, recommended for Capillary- or Nano LC/EC/MS
Spare Parts	
205.0040	ChipCell docking station
205.0045	ChipCell with Pt electrodes, 1 pcs
250.0134	Cell cable for ChipCell

Specifications ChipCell (Nano Flow Applications)

Cell type	Three electrode, thin-layer reactor cell, one inlet with reference electrode (REF), 2 outlets with working (WE) and counter electrode (CE).
Physical dimensions	45 mm x 15 mm x 1.75 mm (LxWxH)
Material	Borosilicate glass
Electrodes	Platinum (Pt) working (WE), reference (REF) and counter (CE) electrode
Total cell volume	ca. 175 nL
Channel size (WE)	25 mm x 500 µm x 5 µm (LxWxH)
Channel size (CE)	25 mm x 500 µm x 5 µm (LxWxH)
Port diameter	0.5 mm
Operating flow rate	Typically 0.5 – 2.5 µL/min, max. 5 µL/min
Max operating pressure	50 bar
Fluidic connections	1/16" OD, 100 µm or 25 µm ID PEEKSIL tubing with 6-32 PEEK connections
Electric connections	Cell cable with spring-loaded ChipCell contacts for use with ROXY Potentiostat
Wetted materials	Polyether ether ketone (PEEK), fused silica, borosilicate glass, Platinum