

### Scientific Characterization and Development of Shaken Bioreactors

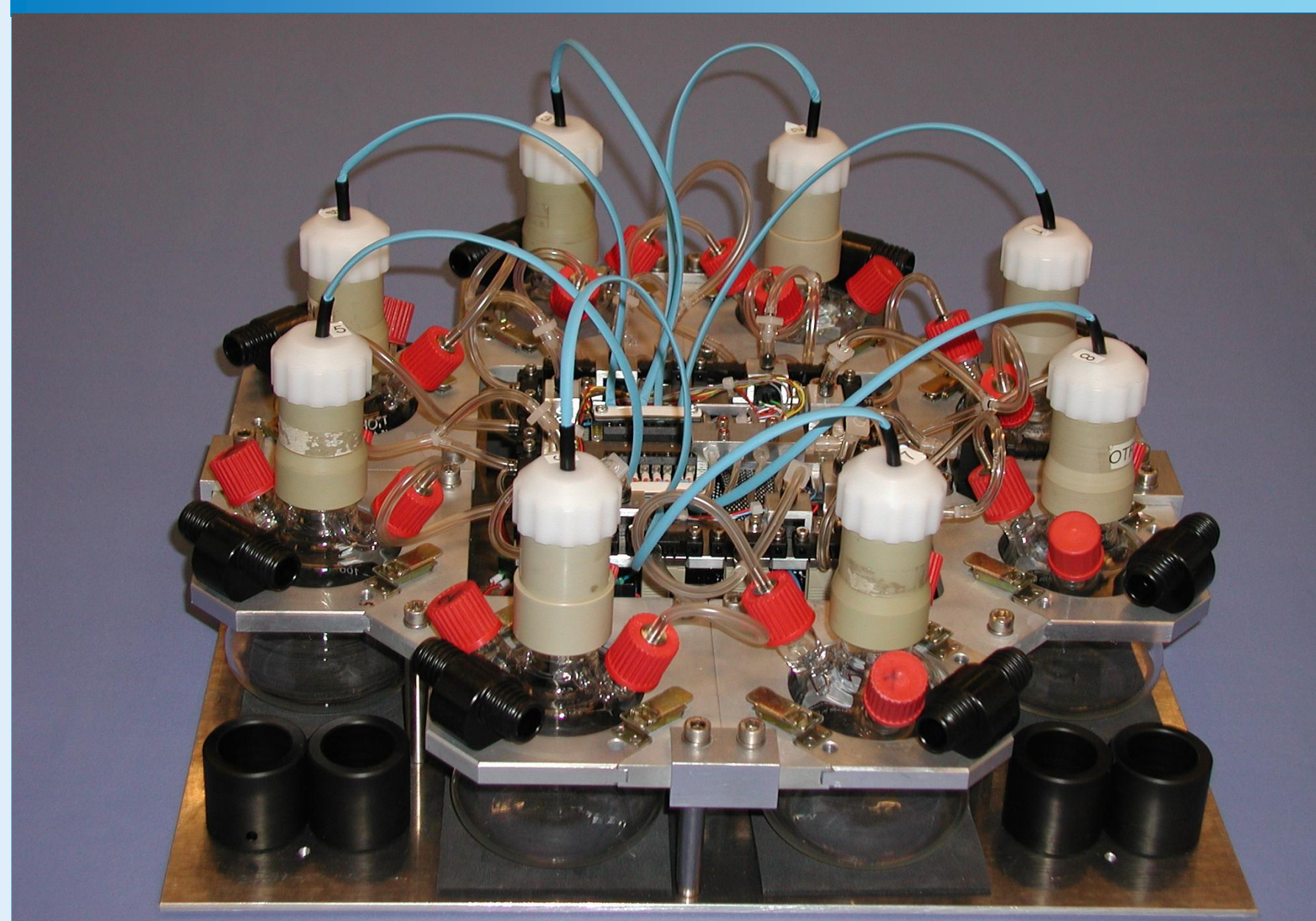
- Development and characterization of common and tailor made shake vessels
- Development of microfluidics for microtiter plates
- Modeling of conditions in shaken bioreactors
- Development of new measuring systems
- Investigation of power input, gas/liquid mass transfer, hydrodynamics and mixing characteristics in shake flasks and microtiter plates

#### BioLector



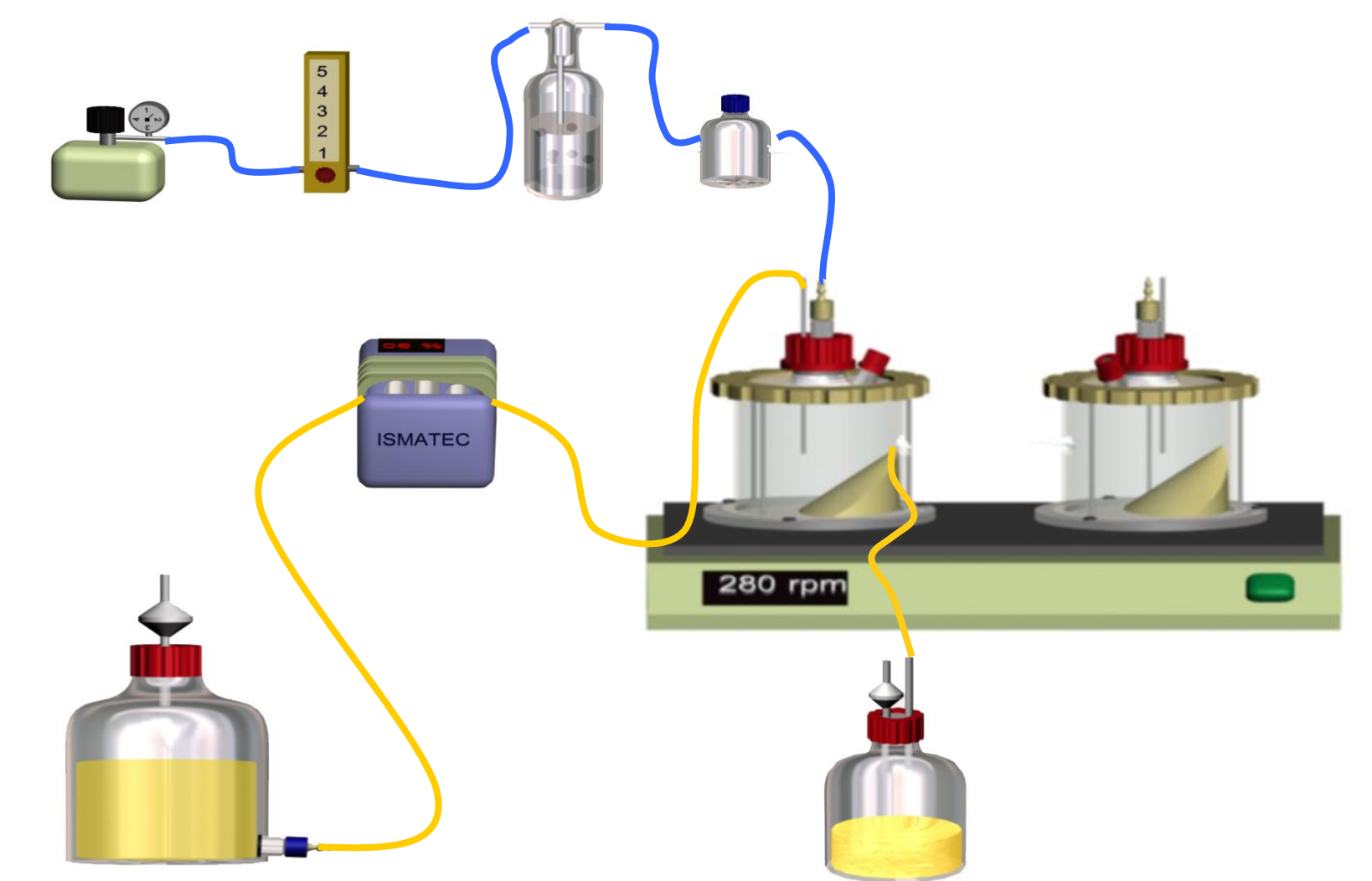
- Permanent shaking device equipped with optical fiber allows measurement of
  - Biomass concentration
  - Fluorescent products
  - Metabolic state
- Determination of pH and dissolved oxygen using optodes

#### RAMOS



- Measurement of  $pO_2$  in the gas phase in shake flasks
- Online calculation of OTR, CTR and RQ
- Determination of oxygen consumption of microorganisms

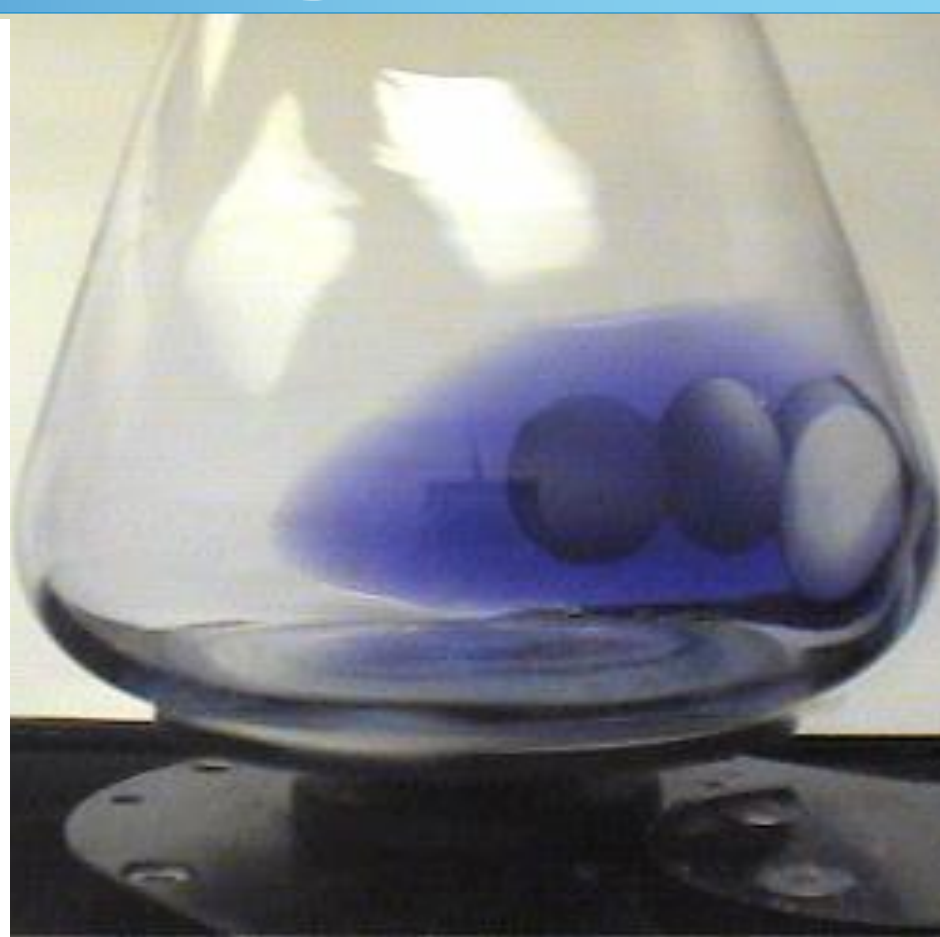
#### COSBIOS



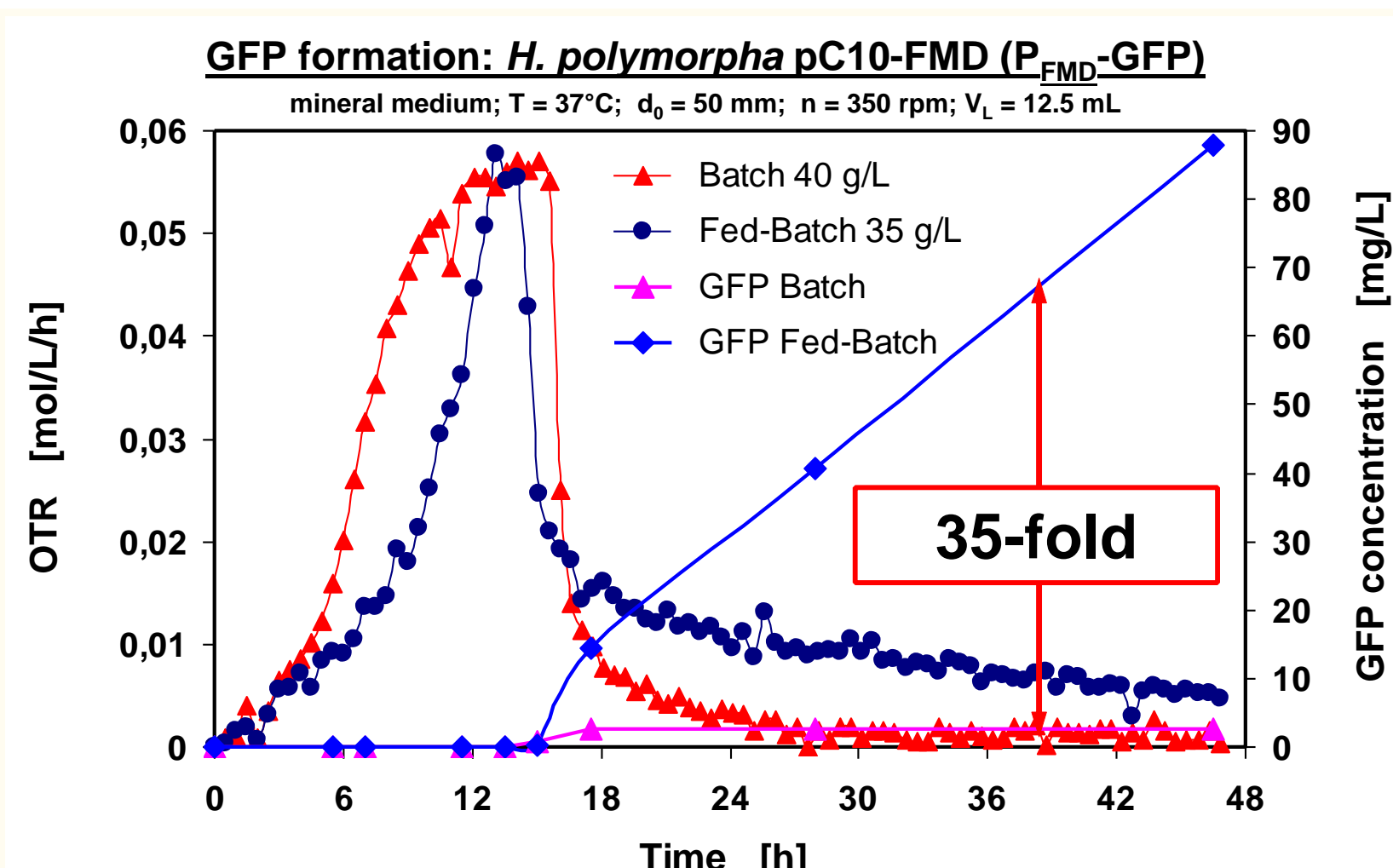
- Up to 6 shaken glass bioreactors for parallel continuous fermentations
- Different dilution rates in parallel flasks
- Reduced experimental effort and costs

#### Slow Release Technology

- Polymer based slow release systems for fed-batch cultivation in shaken bioreactors (shake flasks & microtiter plates)

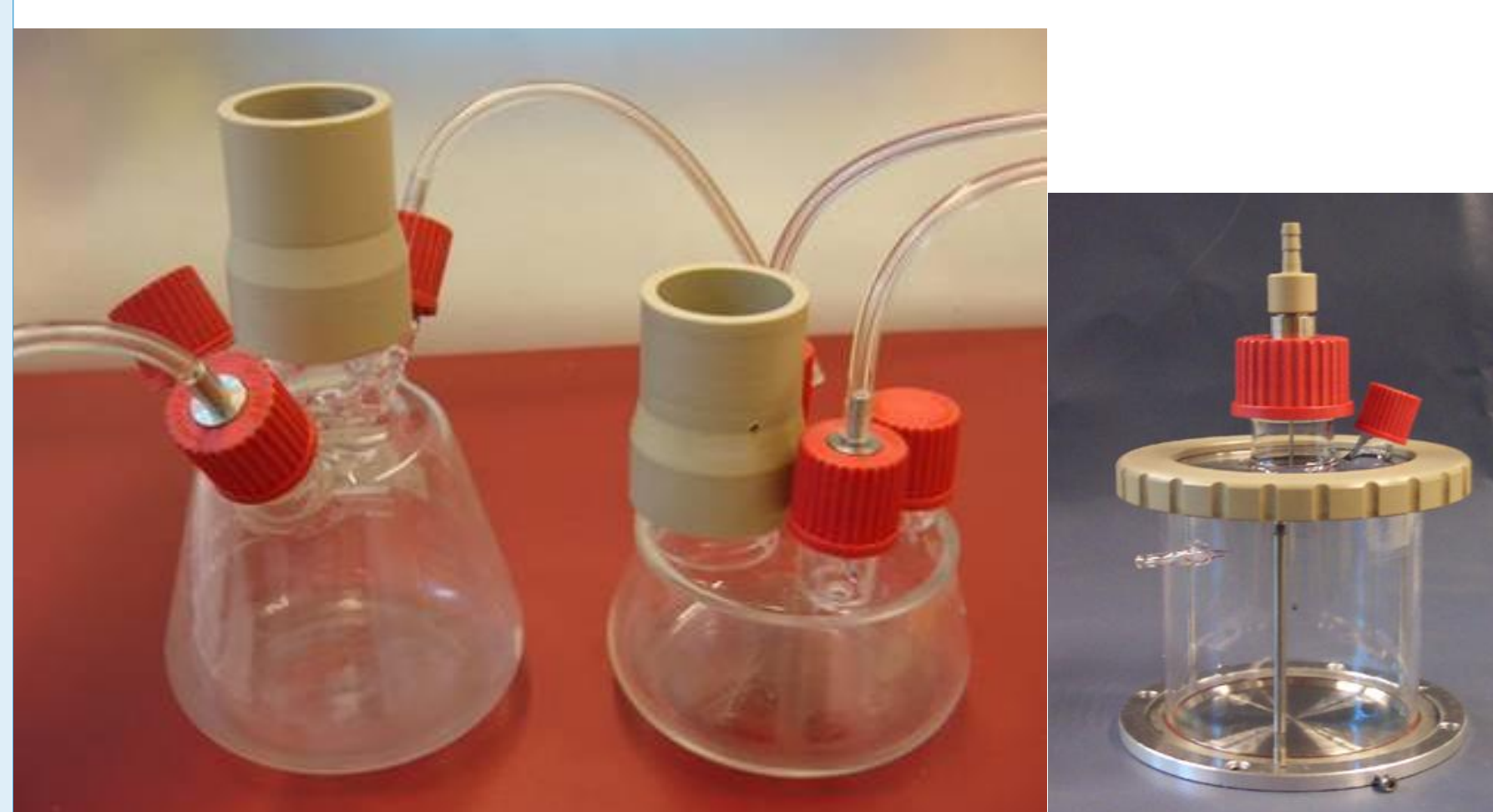


- High cell densities in small scale
- Synchronisation of precultures
- Screening in fed-batch mode
- pH-control in shake flasks
  - Reduction of buffer concentrations



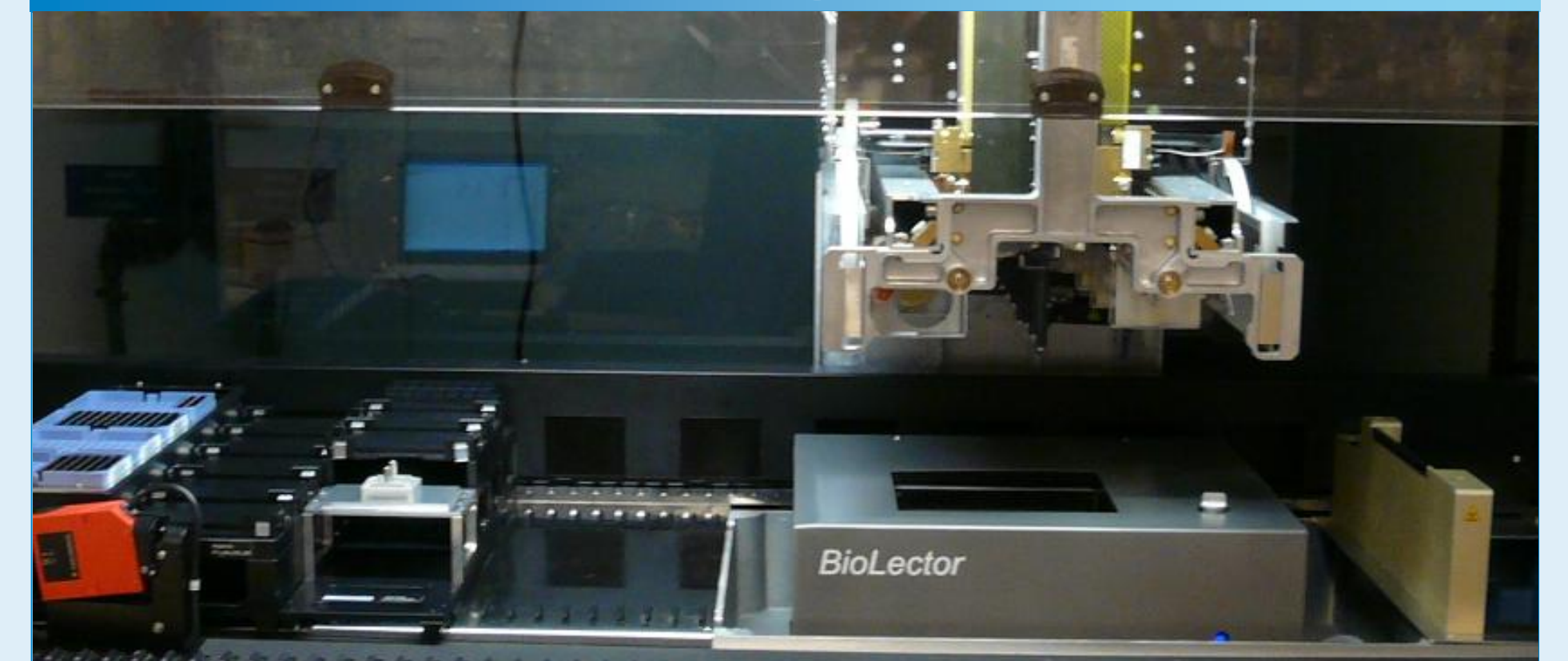
#### Glas bonding

- Production of geometrical reproducible glassware
- Assembly of autoclavable glass/steel and glass/glass bondings
- Reduction of headspace volume in RAMOS flasks results in faster measurement of OTR
- Reduction of component parts of a COSBIOS flask



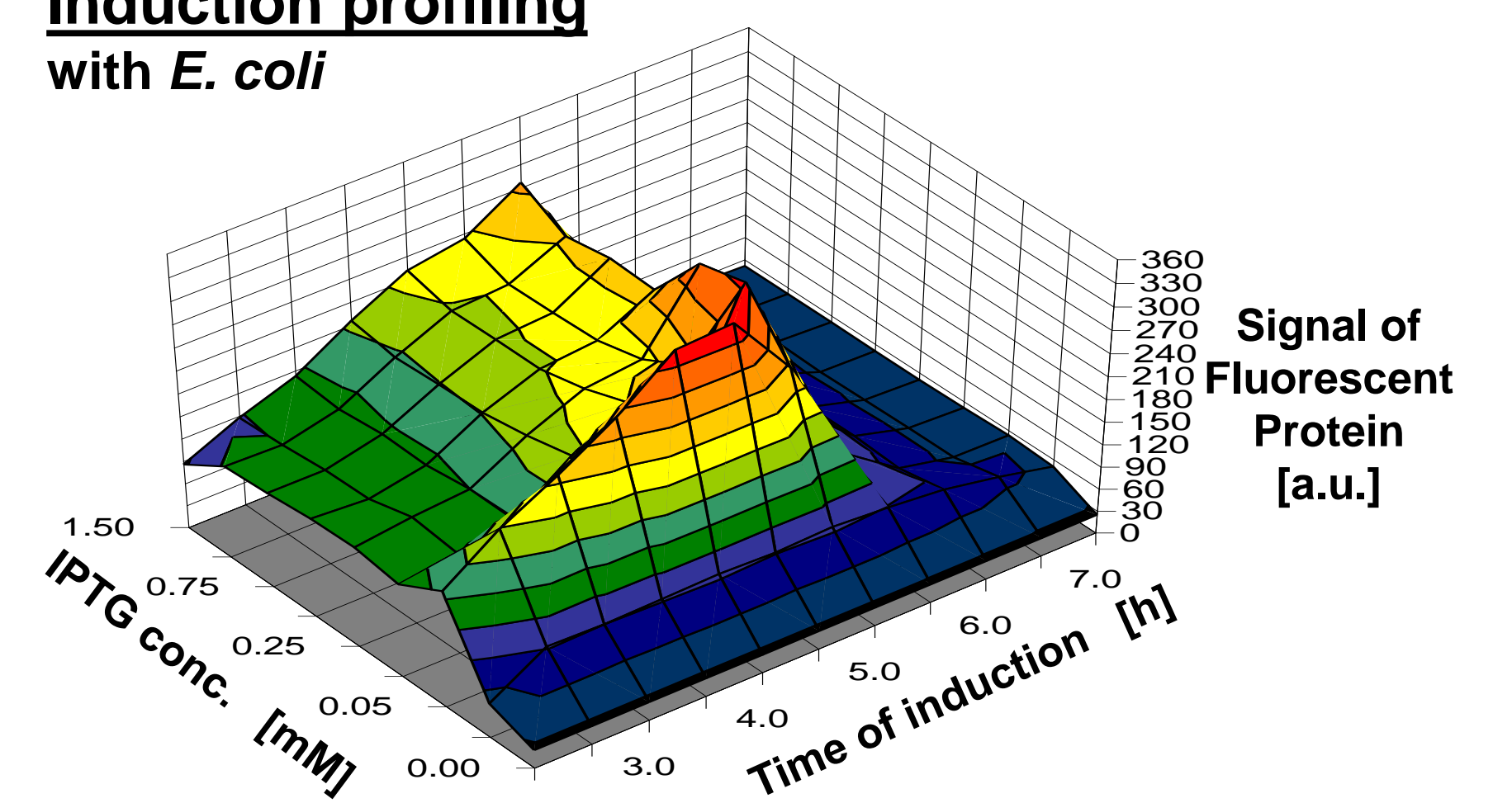
Regular RAMOS flask    Glas bonded RAMOS flask    Modified COSBIOS flask

#### BioLector with Pipetting Robot



- This combination offers applications like
  - Induction profiling (varying inducer conc. and induction time)
  - Media optimization
  - Normaliziaton of microbial growth

#### Induction profiling with *E. coli*



Feel free to contact us! Together we will find a solution for your screening process.