

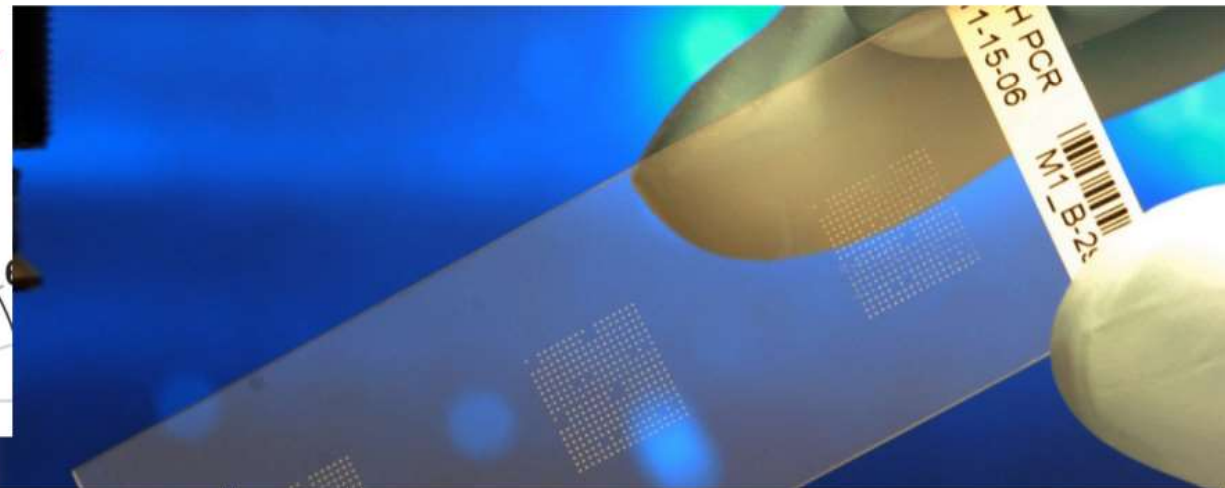
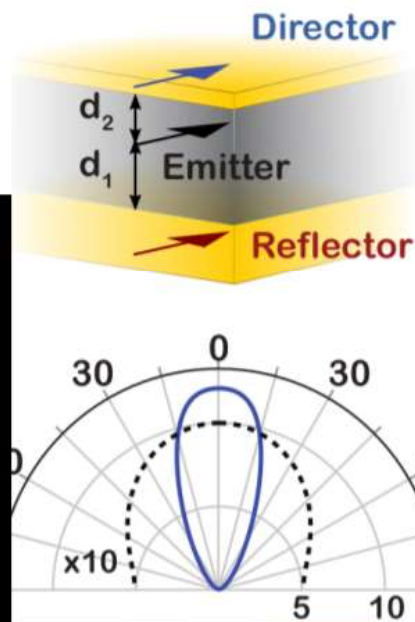
Fiber-based planar antennas for biosensing and diagnostics (FASPEC)

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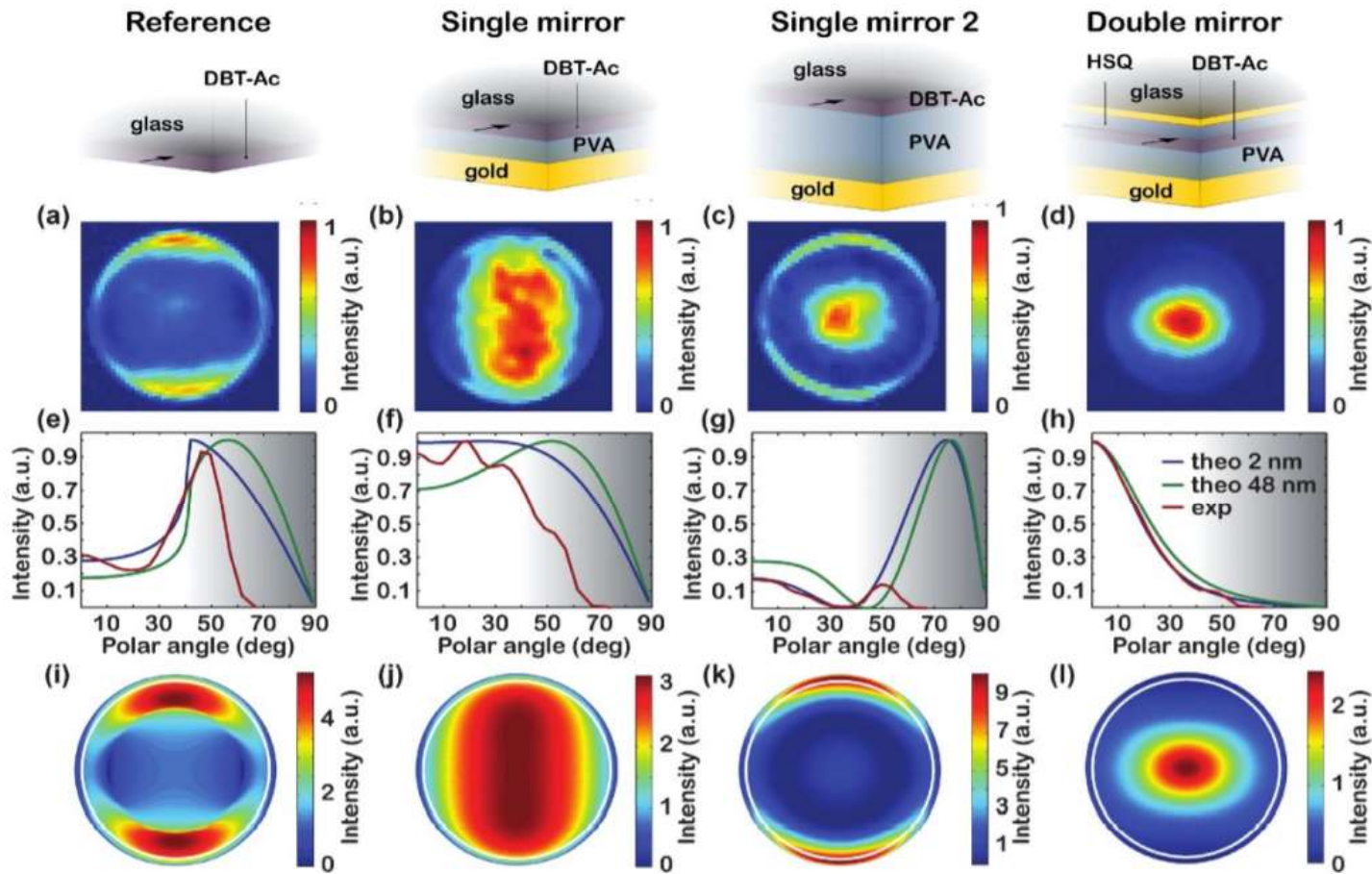
- **4 Research organizations**
- University of Siegen (coordinator)
- National Institute of Optics (CNR-INO)
- Institute of Applied Physics (CNR-IFAC)
- Institute for Beam Technologies (Fraunhofer)
- **2 Companies (SME)**
- GeSiM mbH
- Cecchi srl



GESIM

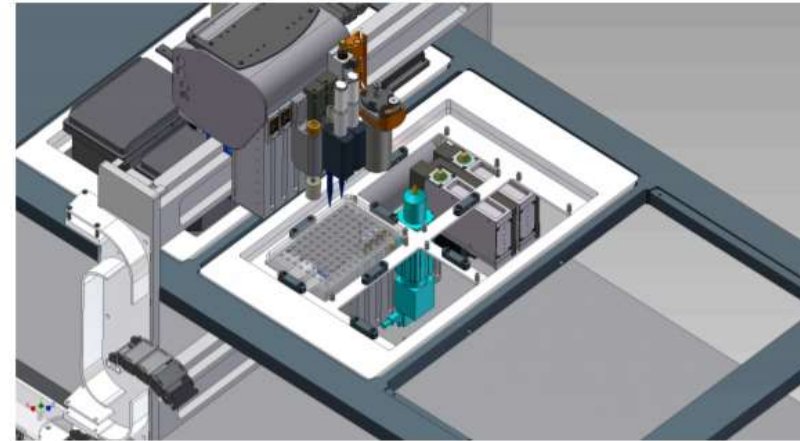
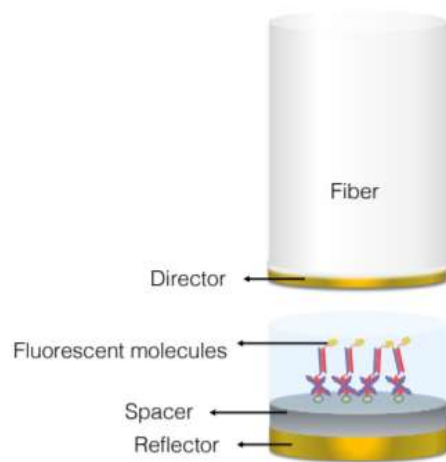


Experiment Configuration
Comparison
Theory



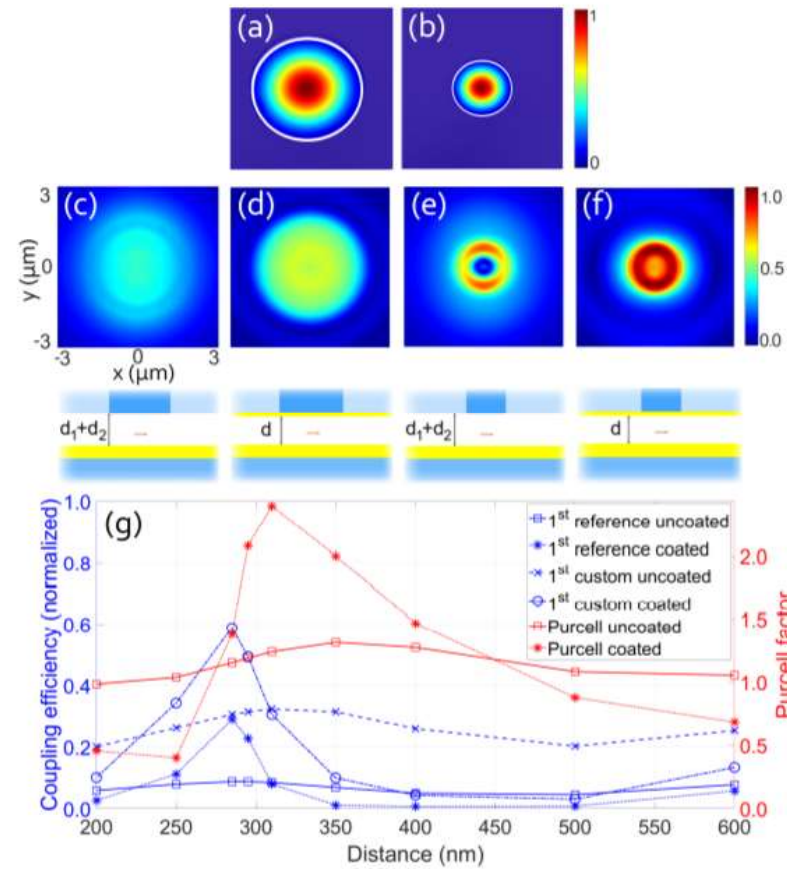
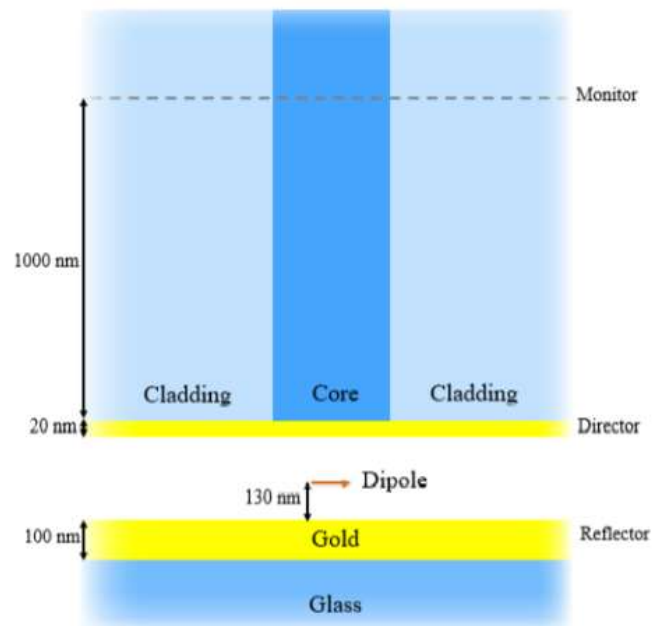
- Published in *Light Science & Applications* (Nature) (2017)
- Nationalization of the patents (PCT) in EU und US, EU patent pending, US granted

- A novel photonic chip for fluorescence readout with sensitivity up to a single molecule (physical limits of detection)
- A photonic chip-compatible bioassay for fluorescence-based IVD of sepsis and detect concentration limits comparable to ELISA and SPR
- Integrate optics and fluidics into a robotic platform for automated operation



- WP1: Technical requirements and specifications
- WP2: Photonic chip manufacturing, design and characterization
- WP3: Dyes, characterization and labeling of biomolecules
- WP4: Lab-on-a-chip chemistry and readout
- WP5: Coupling of the photonic chip to the laboratory automation
- WP6: Testing and validation
- WP7: Management and valorization

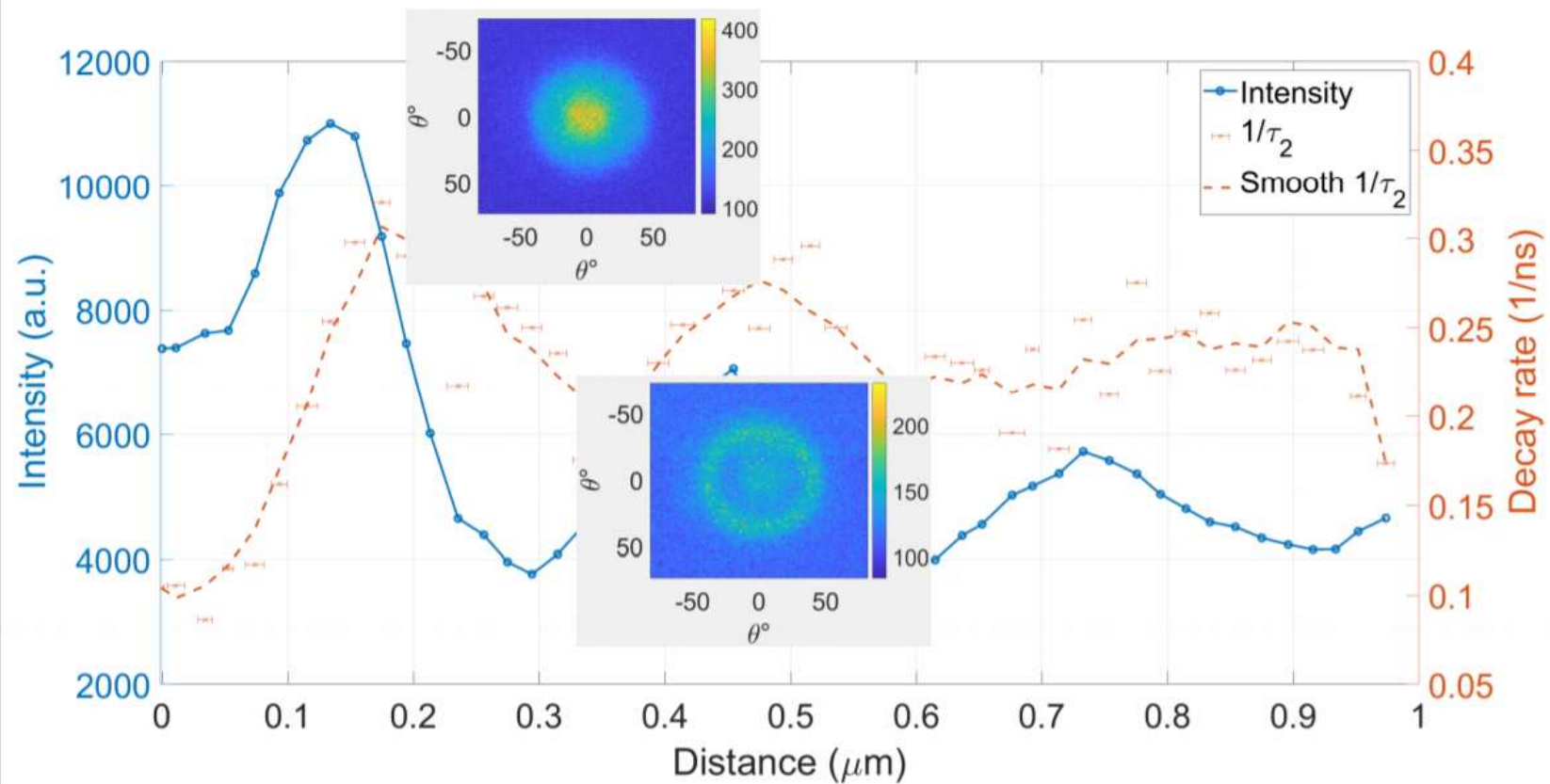
Theoretical results



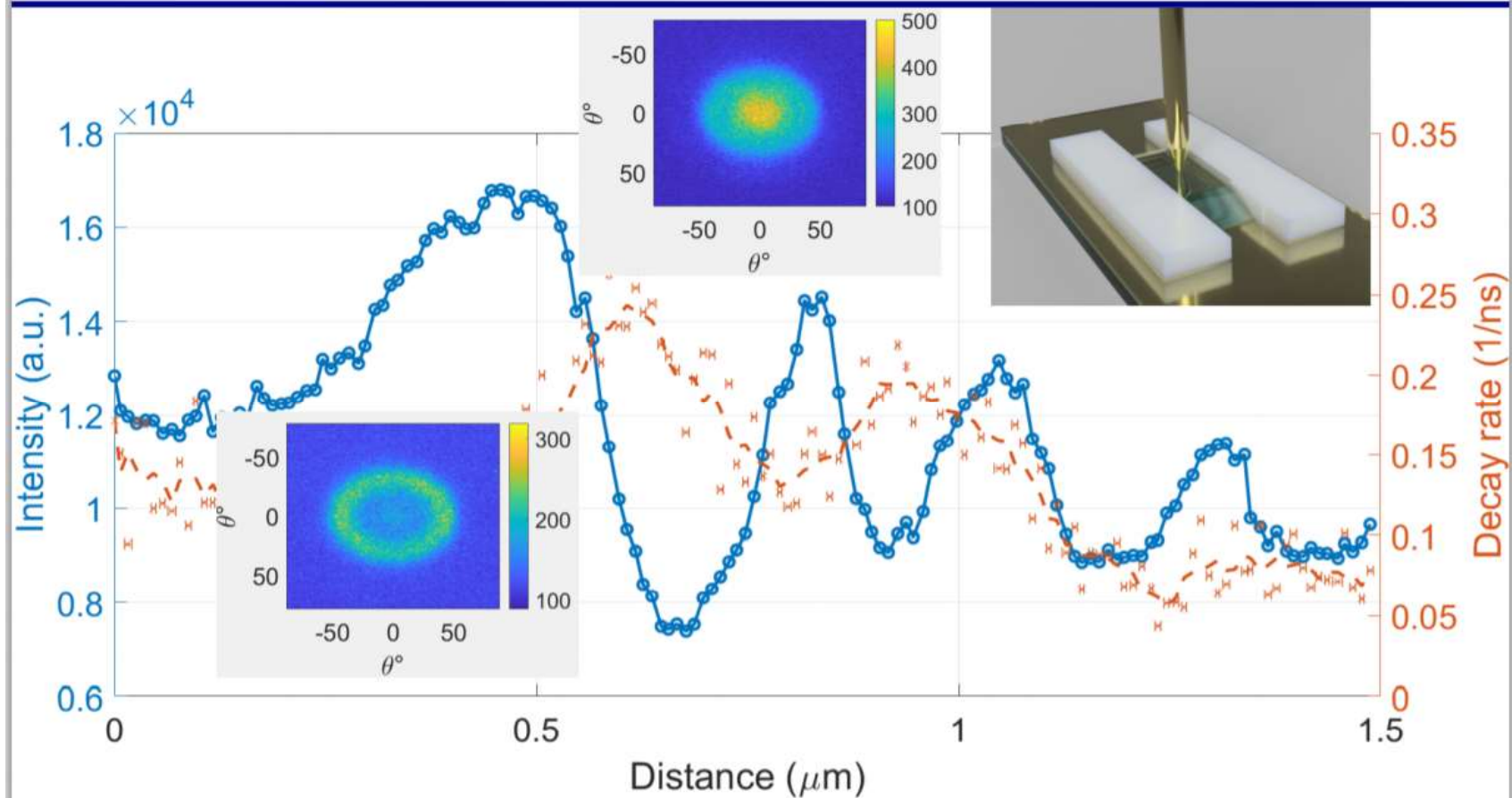
Research setup (Siegen)



Atto 647N dyes in antenna configuration

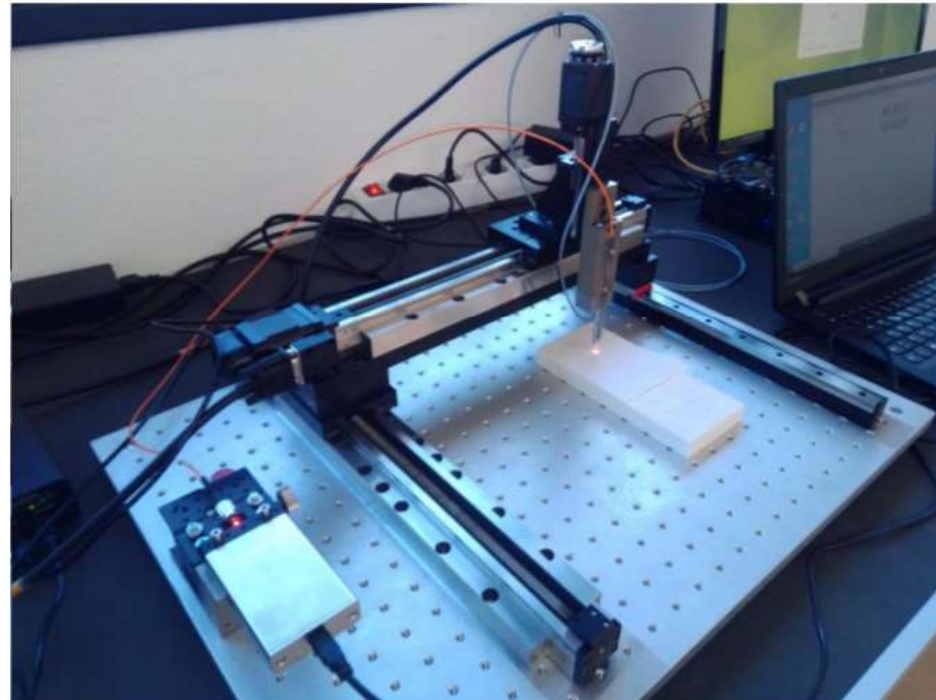


Hybridized DNA (with Atto 647N) in water



“Florence” setup

- “Homebuilt” robotic arm
- Qiagen fluorescence toolkit
- Testing on IGG and PCT fluorescence bioassays



- Commercial automated platform (GeSiM)
- Low-cost fabrication of photonic chip
- Fluid-handling system
- Qiagen fluorescence toolkit
- Testing and validation

