

# Laser Development for Biomedical Applications

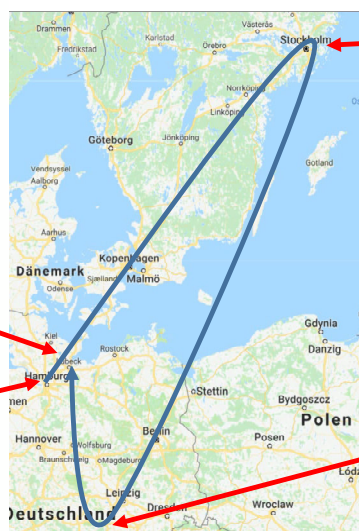
Prof. Dr. Kai Seger

## Introduction

- Kai Seger – Professor for Laser Technology at THL

Advanced R&D at Coherent  
Lübeck

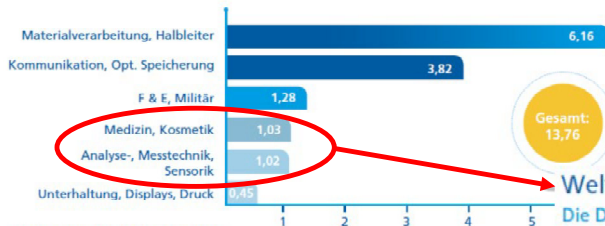
Physics at the University of Hamburg



PhD at Kungliga Tekniska Högskolan  
Stockholm, Sweden

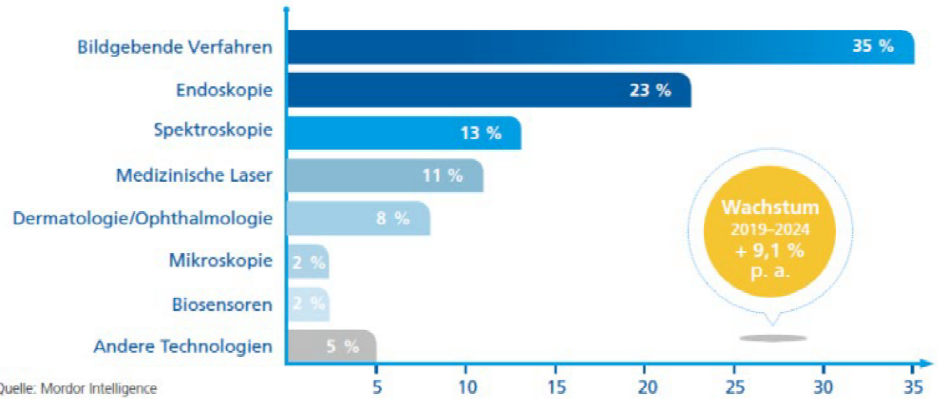
Optical System Design  
Jena

Weltmarkt für Laser nach Anwendungsfeldern (Mrd. USD)  
Die Daten beziehen sich auf das Jahr 2018



Quelle: Strategies Unlimited, Laser Focus World

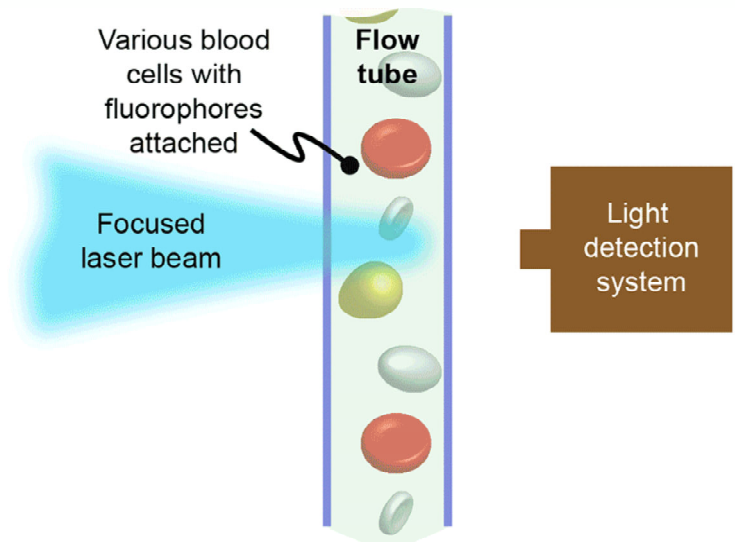
Weltmarkt für Biophotonik nach Produkttypen  
Die Daten beziehen sich auf das Jahr 2018 (Anteile in %)



Quelle: Mordor Intelligence

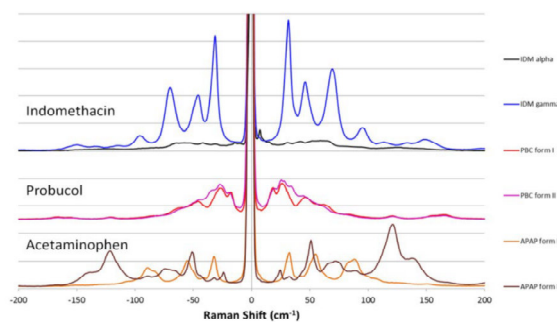
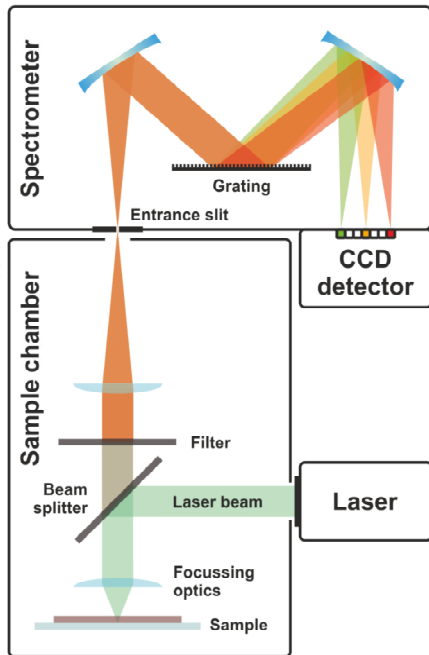
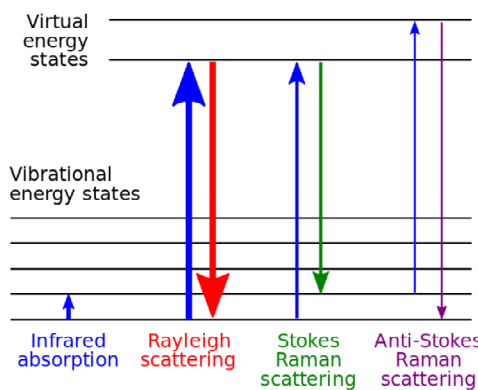
## Flow Cytometry

- Fluorochromes for marking cells
- Each type of fluorochrome sticks only to one specific type of target protein
- Color combination and light intensity identifies the cell
- Laser requirements:
  - Many different wavelength
  - Low noise



Source: Coherent

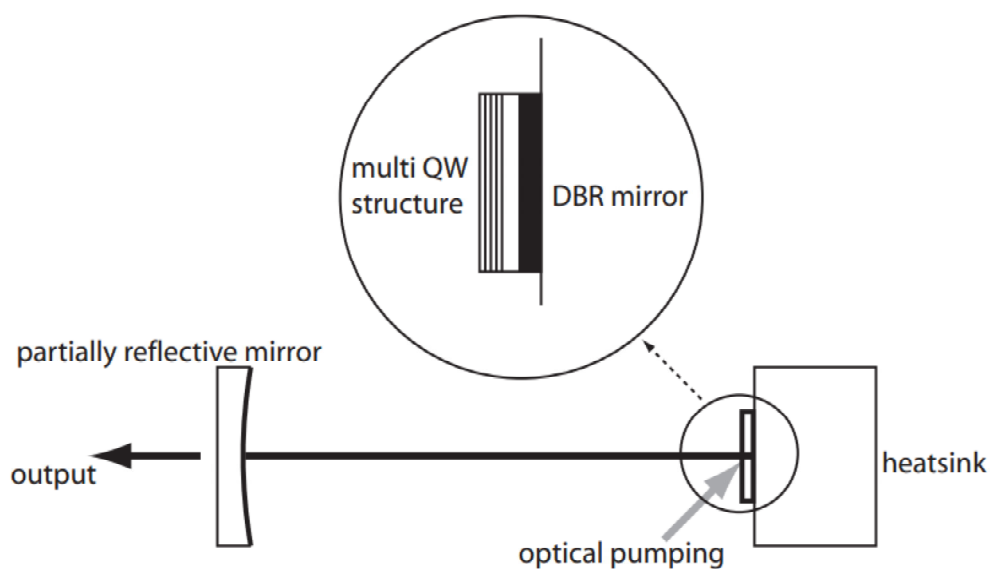
# Raman Spectroscopy



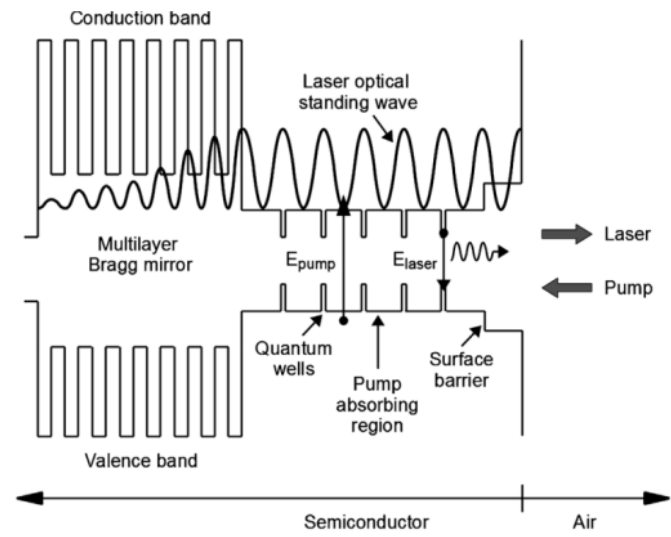
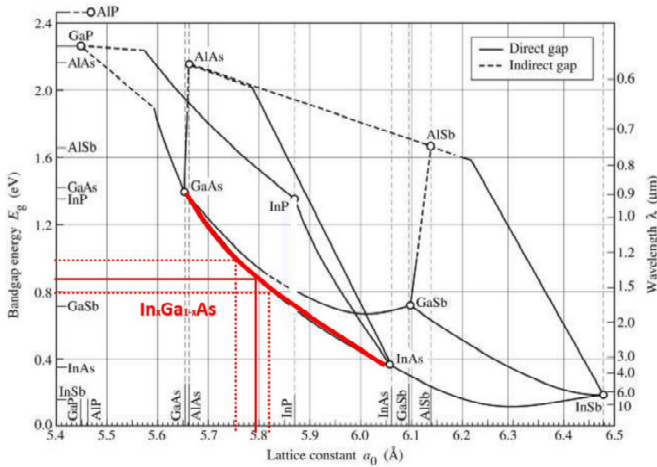
Source: Wikipedia

Source: Coherent

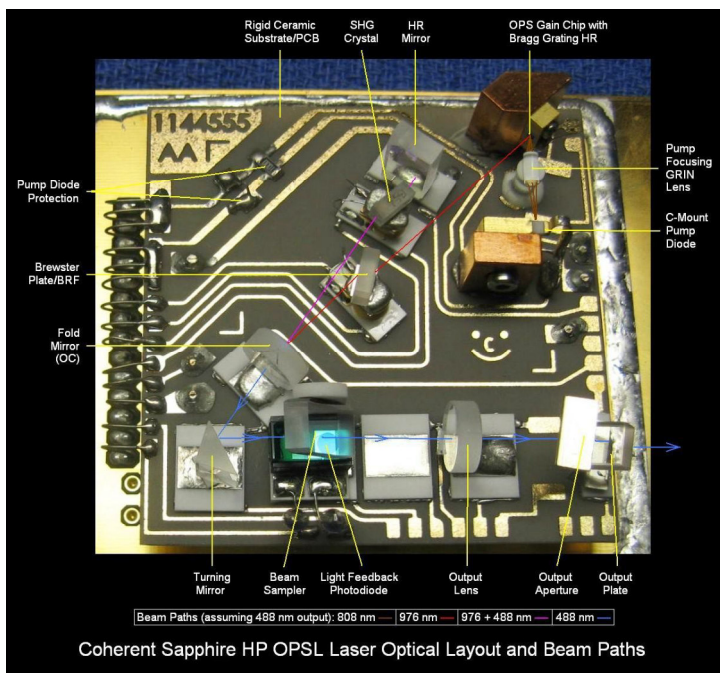
# Quantum Well Lasers



- Quantum Well composition determines band gap (energy/frequency)



## Laser



Source: Coherent

Source: Sam's Laser FAQ

Thank you for your attention!

Any questions?

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