

# Fluorescence methods in life sciences

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# Overview

1. What is the main topic of lectures?
2. Where can be knowledge used?
3. How will be course organizes?



# Why biophysical and spectroscopy methods?

- We can quantify phenomena and compare different biological systems

## Why fluorescence?

- We can see things that would have been hidden

# Literature

- Lakowicz J.R.: Principles of Fluorescence Spectroscopy. Third Edition, Springer + Business Media, New York, 2006.

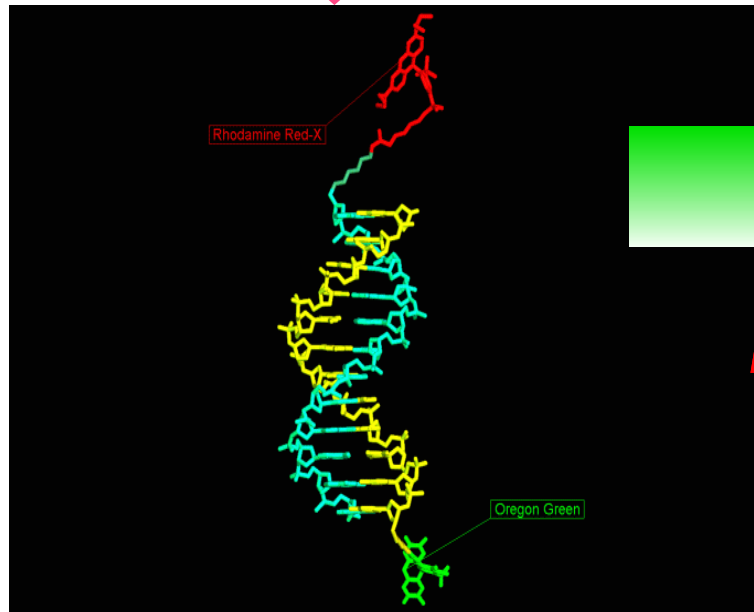
## Poděkování

Grafika z knihy Principles o Fluorescence byla pro účely této přednášky laskavě poskytnuta profesorem J.R. Lakowitzem.

# Fluorescence methods in life sciences

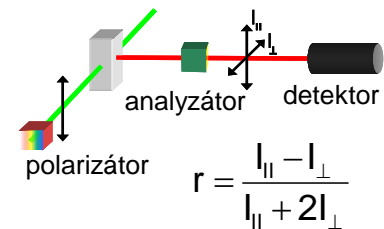
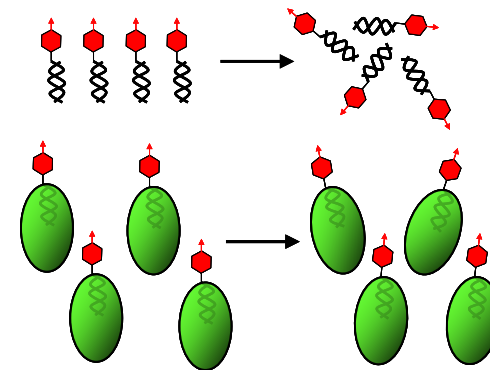
Practical applications of theoretical knowledge

Fluorescently labeled DNA



Labeled protein separation

Binding of DNA and protein  
*Anisotropic fluorescence*

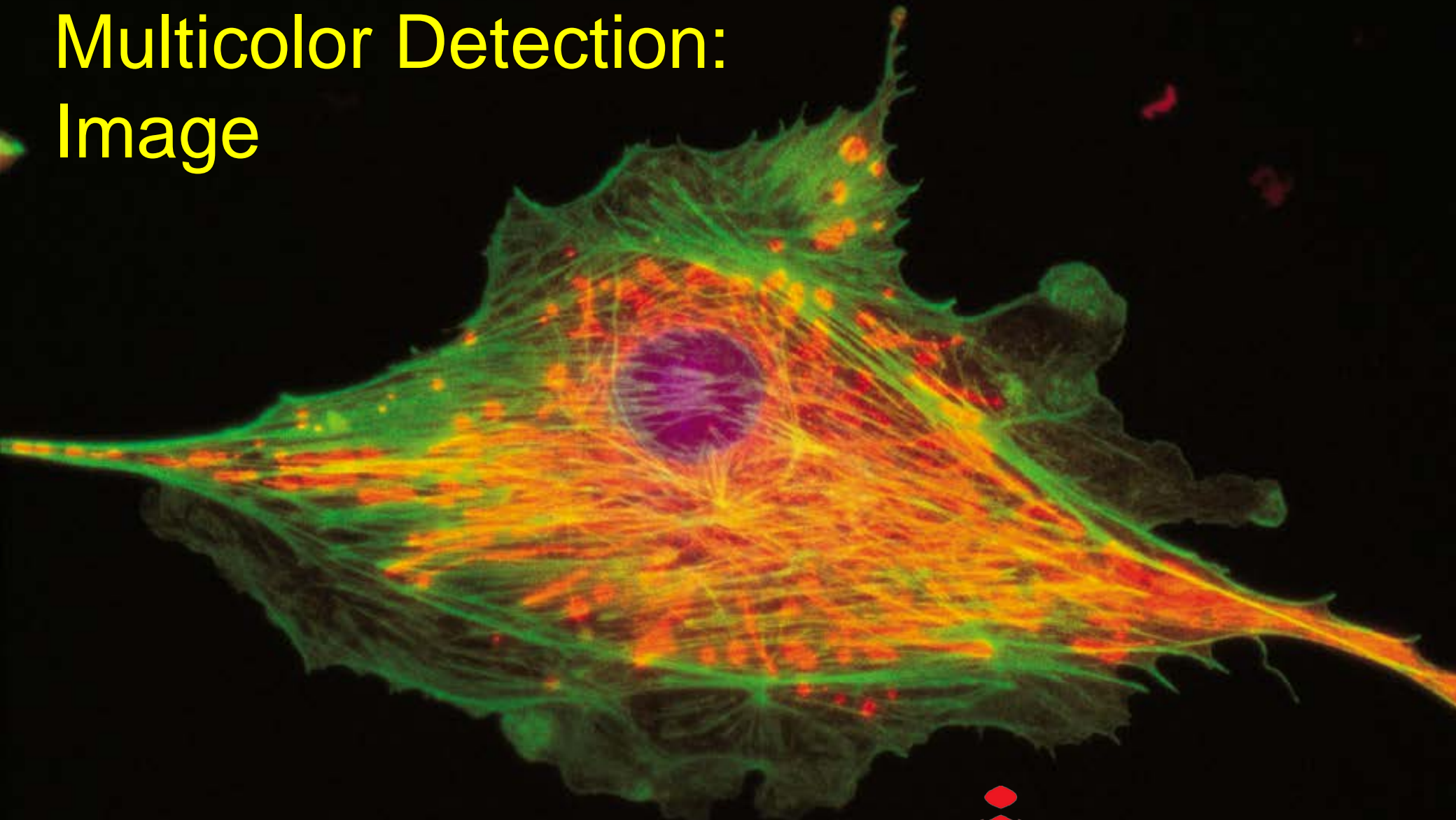


# Where can you use obtained knowledge?

- Practical fluorescence spectroscopy
- When you have **small amount** of your sample
- Everyday laboratory tasks (gel electrophoresis, microscopy)
- **Practicals C7235 !**



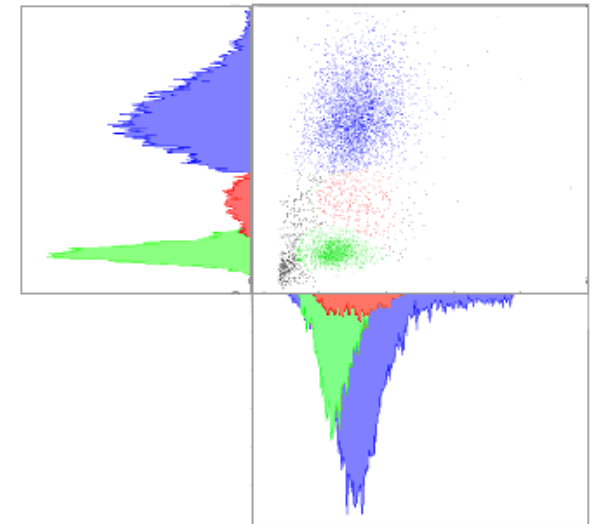
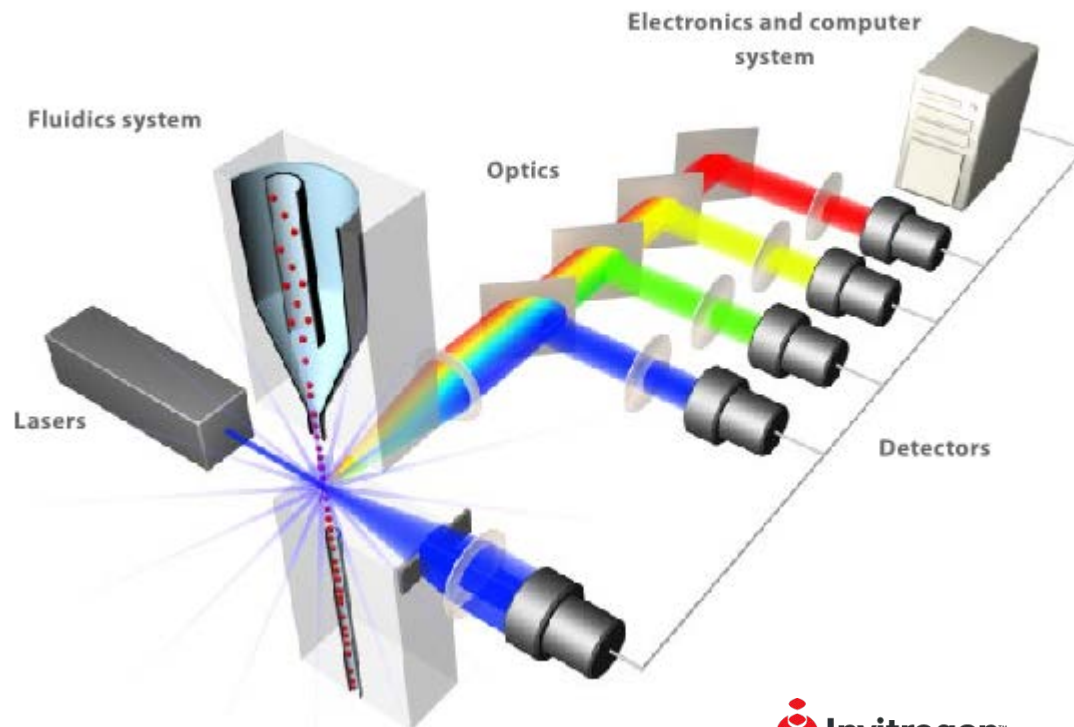
# Multicolor Detection: Image



Stain	Target	Color
DAPI	Nucleii	Blue
BODIPY® FL phalloidin	F-actin	Green
MitoTracker® Red CMXRos	Mitochondria	Orange

# Flow Cytometry

## Summary



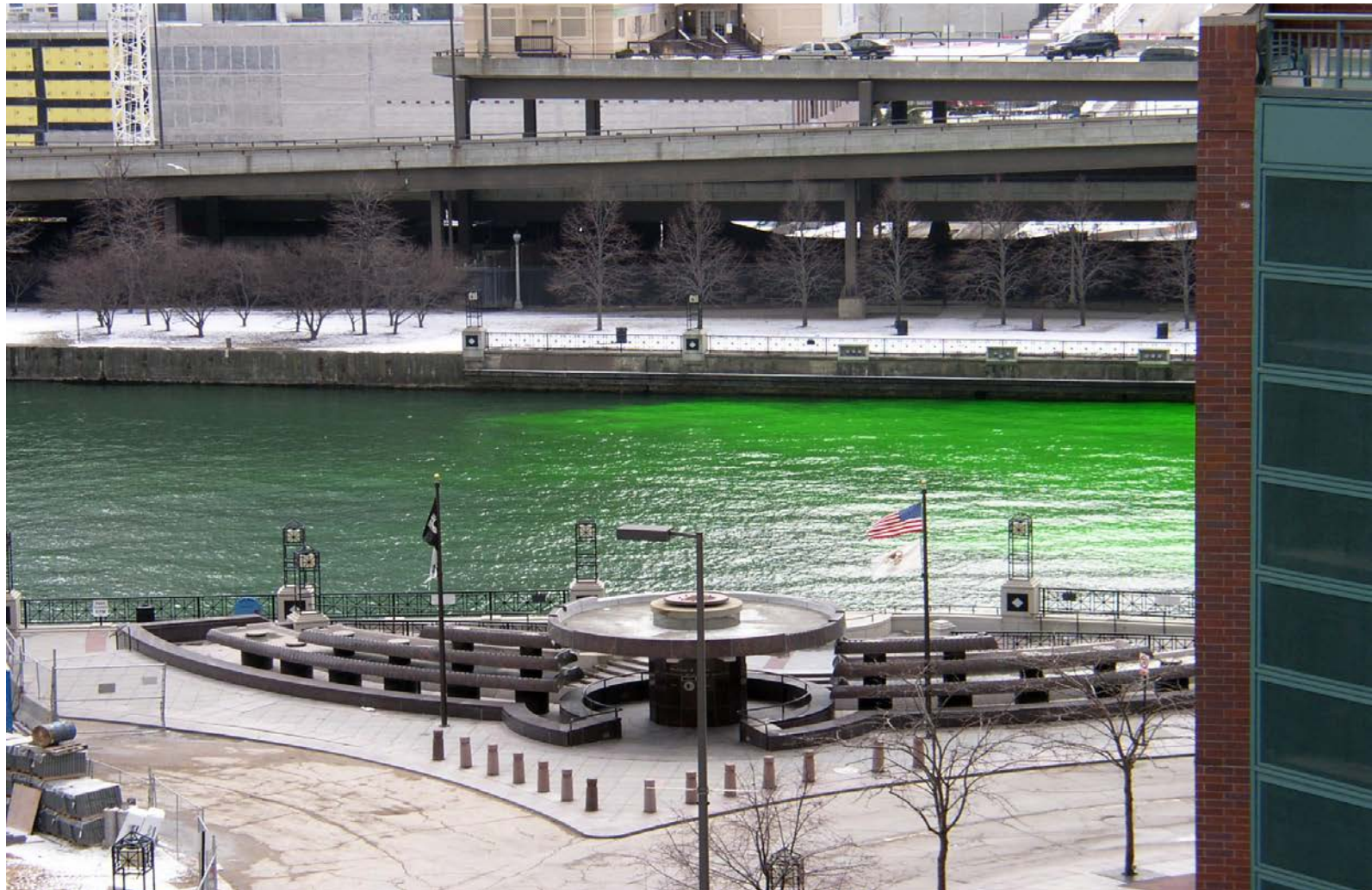
Single cell detection



Cell sorting based on size and fluorescence marker presence.



# Fluorescence at unexpected places



Is fluorescence intrinsic (natural) or extrinsic (synthetic)?

# Task = case studies

- Four tasks
- Points obtained for tasks contribute to exam test score
- If you pass all tasks, you can apply for oral exam
- 48 h for task solution

# Practicals

23.-25.5.2017



# What does shine at the discoteque?



# Home work

- Narrating 0:40 do 3:00

## **Introduction to Fluorescence**

<https://www.thermofisher.com/cz/en/home/support/tutorials.html#vid1>