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Research Infrastructure

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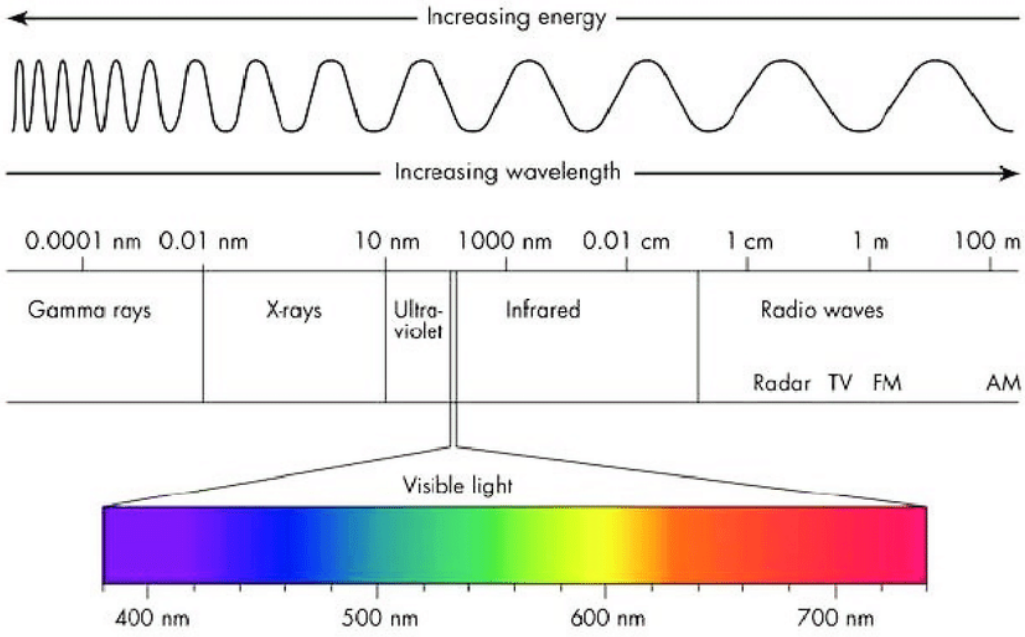
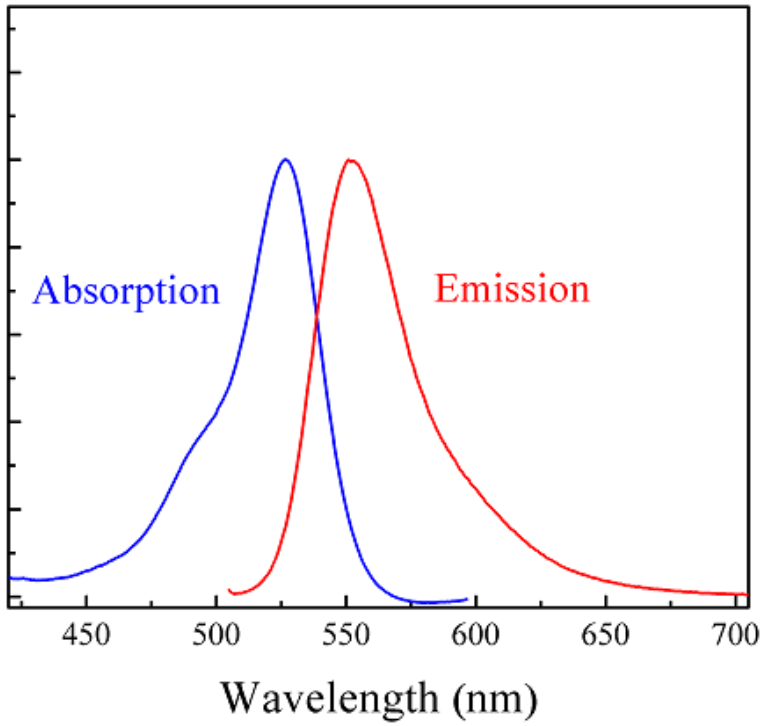
ESC 2

Fluorescence Imaging techniques

Sofie Nyström

Fluorescence

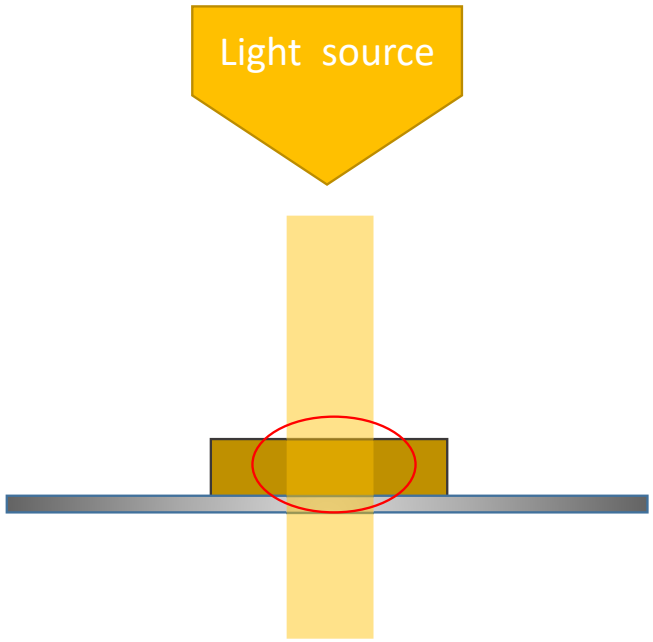




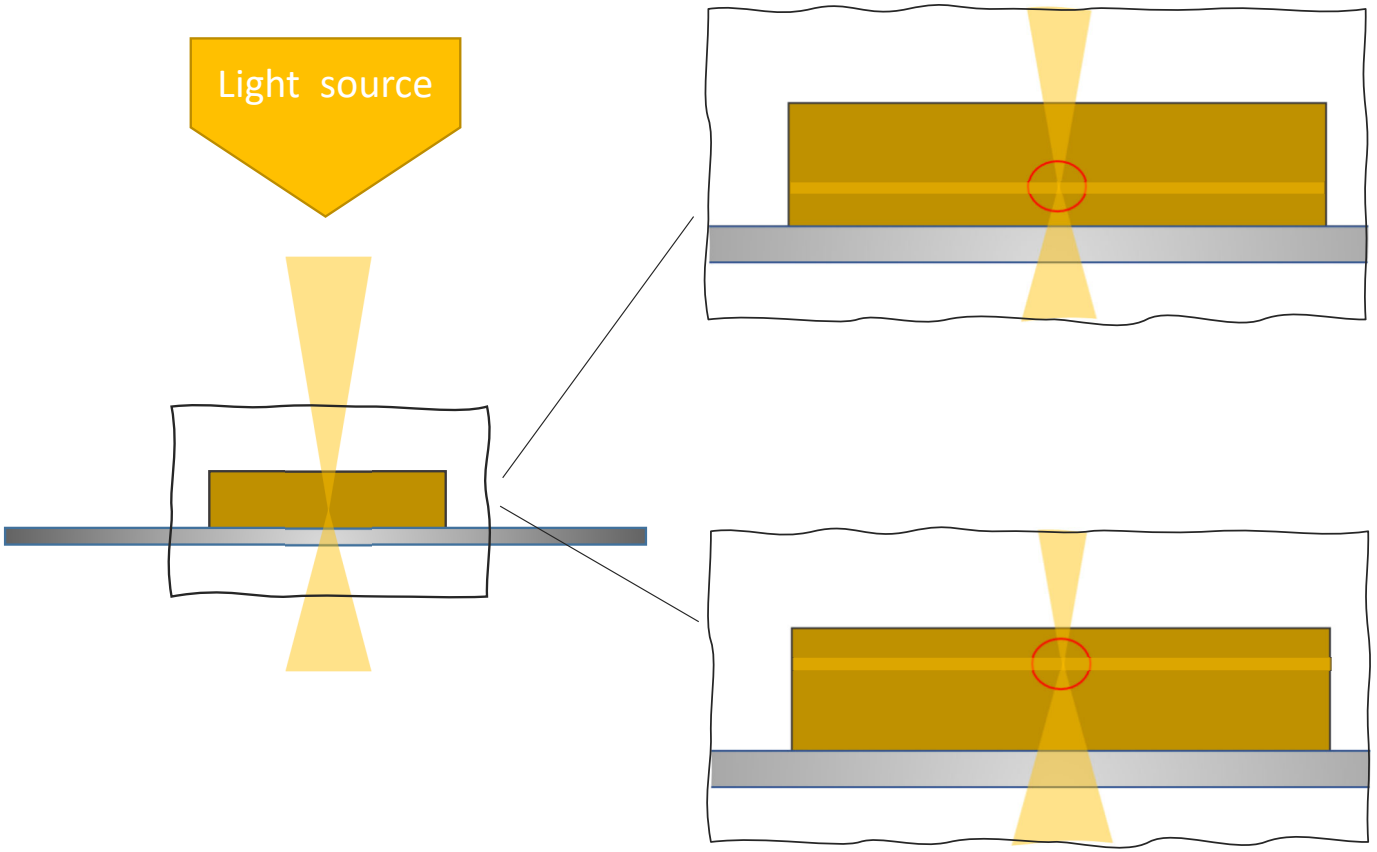
Fluorescence microscopy

-Two main approaches

Epifluorescence



Confocal



Fluorophores

Important parameters

-Stokes shift

needs to be large enough (helps with inevitable filtration of excitation needs)

-Quantum yield

important for the brightness of the fluorophore

-Chemical stability

so the molecule does not fall apart

-Optical stability

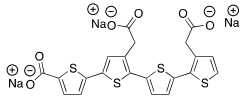
so the molecule does not bleach

Fluorescent small molecule probes

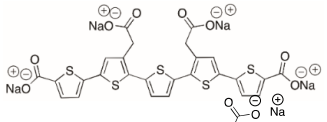
-amyloid probes, the ”Linköping collection”

These probes have affinity for the amyloid structure, no antibody needed

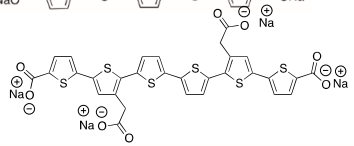
qFTAA



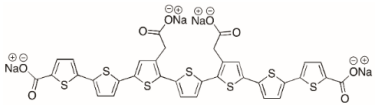
pFTAA



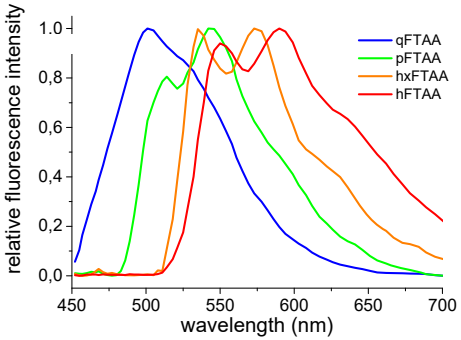
hxFTAA

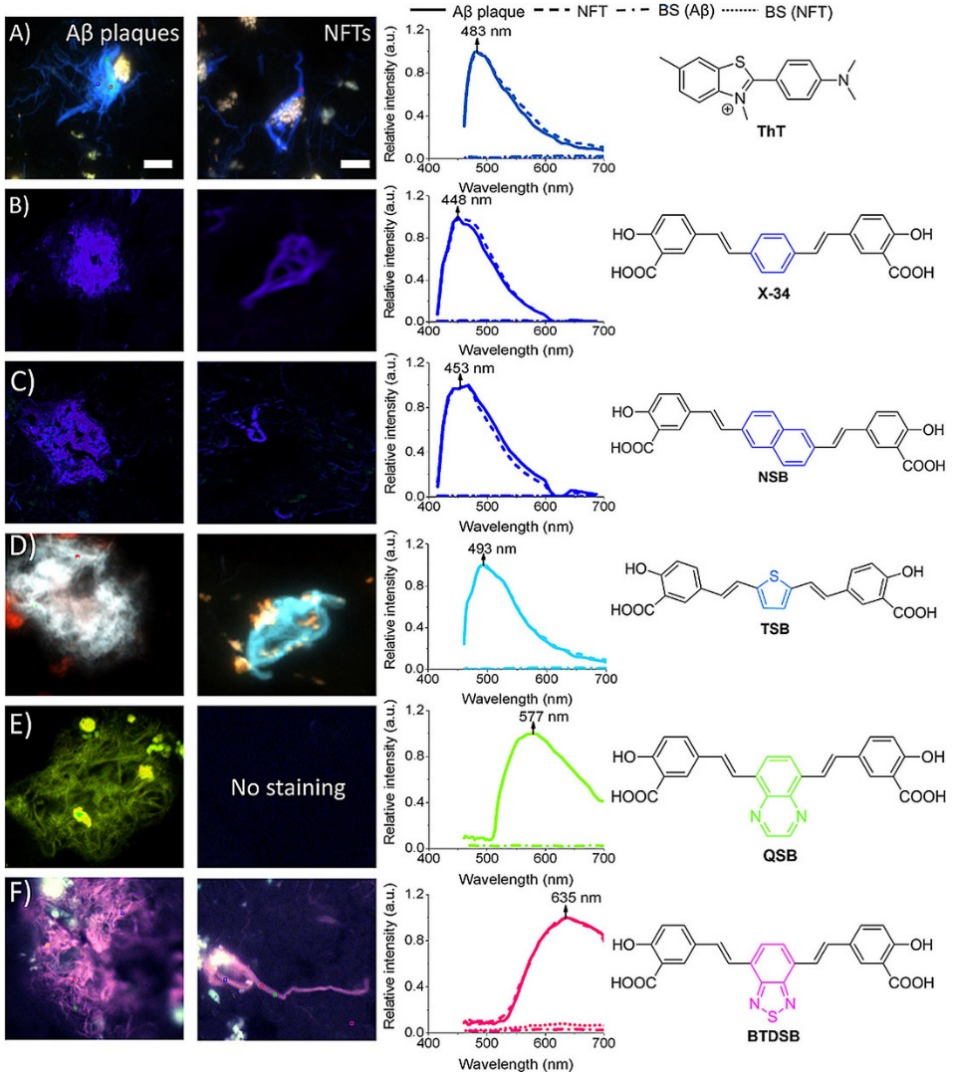


hFTAA



Fluorescence emission spectra

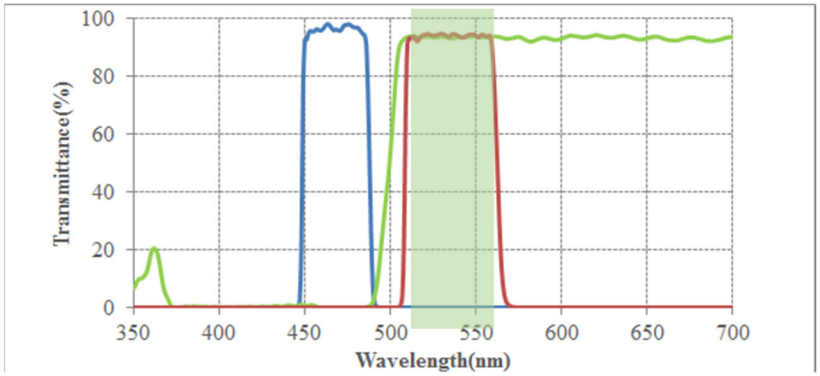




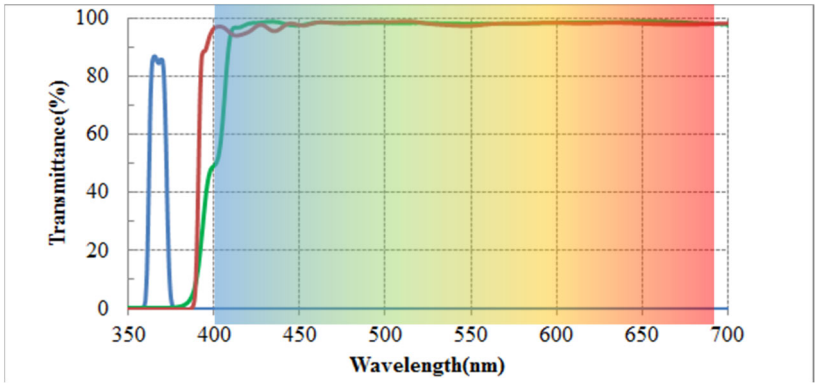
Fluorescence microscopy

-Filters and channels

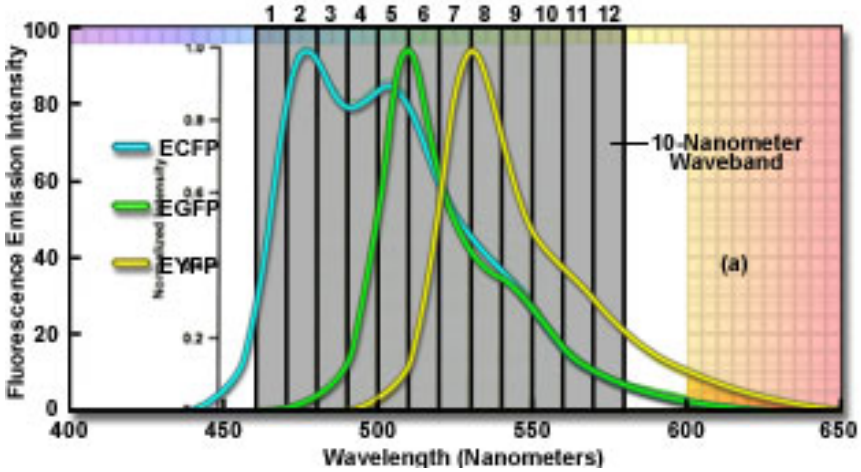
Short pass emission filters – one color



Long pass emission filters – all colors



Detection channels- each channel sensitive to one color



Hyperspectral microscopy

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Video Article

Imaging Amyloid Tissues Stained with Luminescent Conjugated Oligothiophenes by Hyperspectral Confocal Microscopy and Fluorescence Lifetime Imaging

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Watch the video:
https://www.jove.com/t/56279/imaging-amyloid-tissues-stained-with-luminescent-conjugated