Z-project: Neuropathology

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What can we offer?

**Expertise**
- full range of histopathological analysis for both human and mouse tissue samples of CNS, muscle and nerve,
- assistance in planning of projects, analysis and interpretation of results

**Tissue processing, embedding, cutting:**
- Paraffin embedding of formalin-fixed tissue
- Plastic embedding for EM
- Paraffin sections
- Frozen sections
- Vibratome sections
- Ultrathin plastic sections
- Generation of tissue microarrays

**Stainings:**
- standard histological stains
- Automated immunohistochemistry and immunofluorescence including antibody establishment
- in situ hybridisation
- TUNEL...
**Microscopes:**
- Light and fluorescence microscopes with CCD cameras

- Confocal laser scanning microscope: LEICA TCS SP8 with white light laser (470-670nm); live cell imaging module

- SpectraCube system for spectral imaging and linear unmixing
Spectral imaging SpectraCube system (Applied spectral imaging ASI)

Hesed M Padilla-Nash, Linda Barenboim-Stapleton, Michael J Difilippantonio & Thomas Ried


common path Sagnac interferometer mounted on a rotatable disk coupled to a CCD camera for image registration
Spectral imaging SpectraCube system (Applied spectral imaging ASI)

Underlying principle is the simultaneous measurement of the detailed spectrum of every point of a given area (i.e. of each pixel of a given CCD array), Able to record fluorescence or brightfield spectra, such as absorption, transmission, or reflection spectra. Spectral range 450-800 nm spectral resolution 5nm at 400 nm, <20nm at 780 nm, completely visible as well as the near infrared
Luminescent conjugated polymers (LCPs)

- Molecules with rotationally flexible polythiophene chains
- Geometrical changes of the polymer chains gives changes in fluorescence

Conformation sensitive optical probes

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PTAA binds to inclusions in ALS resulting in distinct emission spectrum

Ex: 405/30 long-pass filter
Em spectra: 450-800 nm
Spectral unmixing in multiple labeling experiments:

highly useful technique to untangle fluorescence spectral overlaps in cells and tissues labeled with synthetic fluorophores that would be otherwise difficult to separate (e.g. multi-labeling, life cell imaging separation of EYFP and EGFP)

SYTOX Green = nucleus, emission maximum 523
Alexa Fluor 488 = actin, emission maximum 518
Oregon Green 514 = mitochondria, emission maximum 528
Standard FITC cube, spectral imaging combined with spectral unmixing.
Spectral unmixing in multiple labeling experiments: