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**Image 1 and 1a. Tracking protein localization in live cells of *Neurospora crassa*.**

**Visualized:** A segment of mature hyphae of live filamentous fungus *Neurospora crassa*.

**Methods and Techniques:** Fluorescent microscopy of live cells. The location of nuclei inside live cells of *Neurospora crassa* is marked by Histone H1 protein fused with red fluorescent protein (RFP, red). Histone H1 binds DNA inside nuclei. DNA repair protein RAD52 is tagged with recombinant green fluorescent protein (GFP, green) from Discosoma species. Co-localization of the DNA repair protein (green) with DNA (red) is indicated by yellow foci in the merged image consisting of RFP, GFP, and DIC (differential interference contract) images.

**Microscope:** DeltaVision II microscope system utilizing Olympus IX-71 inverted microscope with a xenon arc lamp as the illumination source. Images were taken at 100x (oil) using FITC and TRITC filter sets for multi-color fluorescence and live cell imaging. Image capture was done with the CoolSnap HQ2, Z stacks were further analyzed using the acquisition software SoftWorx.

**Image 2. Tracking protein localization in live cells of *Neurospora crassa*.**

**Visualized:** Two mature hyphae of Neurospora crassa with multiple nuclei expressing GFP/ RFP-tagged proteins.

**Methods and Techniques:** Fluorescent microscopy of live cells. The location of nuclei inside live cells of *Neurospora crassa* is marked by Histone H1 protein fused with red fluorescent protein (RFP, red). Histone H1 binds DNA inside nuclei. DNA repair protein RAD52 is tagged with recombinant green fluorescent protein (GFP, green) from jellyfish *Aequorea victoria*. Co-localization of the DNA repair protein (green) with DNA (red) is indicated by yellow foci in the merged image consisting of RFP, GFP, and DIC (differential interference contract) images.

**Microscope:** DeltaVision II microscope system utilizing Olympus IX-71 inverted microscope with a xenon arc lamp as the illumination source. Images were taken at 100x (oil) using FITC and TRITC filter sets for multi-color fluorescence and live cell imaging. Image capture was done with the CoolSnap HQ2, Z stacks were further analyzed using the acquisition software SoftWorx.

**Image 3. Tracking protein localization in live cells of *Neurospora crassa* in response to DNA damage.**

**Visualized:** A germinated conidium of the filamentous fungus *Neurospora crassa* expressing proteins tagged with green fluorescent protein from jellyfish Aequorea victoria (GFP) and red fluorescent protein (RFP). GFP-tagged protein participates in DNA repair and forms foci in response to DNA damage (as visualized in the image). These foci co-localize with DNAas indicated by RFP signal from RFP-tagged Histone H1 protein.

**Methods and Techniques:** Fluorescent microscopy of live cells. The location of multiple nuclei inside live cells of Neurospora crassa is marked by Histone H1 protein fused with RFP(red). Histone H1 marks the location of DNA (nuclei). A DNA repair protein is tagged with recombinant GFP (green). Co-localization of the DNA repair protein (green) with DNA (red) is indicated by yellow-green foci in the merged image of GFP, RGP, and DIC images.

**Microscope:** DeltaVision II microscope system utilizing Olympus IX-71 inverted microscope with a xenon arc lamp as the illumination source. Images were taken at 100x (oil) using FITC and TRITC filter sets for multi-color fluorescence and live cell imaging. Image capture was done with the CoolSnap HQ2, Z stacks were combined using the acquisition software SoftWorx.

**Image 4. Tracking nuclei n in live cells of *Neurospora crassa*.**

**Visualized:** A germinated conidium of the filamentous fungus *Neurospora crassa* expressing Histone H1 protein tagged with red fluorescent protein (RFP). The red foci are fungal nuclei.

**Methods and Techniques:** Fluorescent microscopy of live cells. The location of multiple nuclei inside live cells of Neurospora crassa is marked by Histone H1 protein fused with RFP(red). Histone H1 marks the location of DNA (nuclei). A DNA repair protein is tagged with recombinant GFP (green). Co-localization of the DNA repair protein (green) with DNA (red) is indicated by yellow-green foci in the merged image of GFP, RGP, and DIC images.

**Microscope:** DeltaVision II microscope system utilizing Olympus IX-71 inverted microscope with a xenon arc lamp as the illumination source. Images were taken at 100x (oil) using FITC and TRITC filter sets for multi-color fluorescence and live cell imaging. Image capture was done with the CoolSnap HQ2, Z stacks were combined using the acquisition software SoftWorx.

**Image 5. Tracking protein localization in live cells of *Neurospora crassa* in response to DNA damage.**

**Visualized:** A germinated conidium of the filamentous fungus *Neurospora crassa* expressing proteins tagged with green fluorescent protein from jellyfish Aequorea victoria (GFP) and red fluorescent protein (RFP). GFP-tagged protein participates in DNA repair and forms foci in response to DNA damage (as visualized in the image). These foci co-localize with DNAas indicated by RFP signal from RFP-tagged Histone H1 protein.

**Methods and Techniques:** Fluorescent microscopy of live cells. The location of multiple nuclei inside live cells of Neurospora crassa is marked by Histone H1 protein fused with RFP(red). Histone H1 marks the location of DNA (nuclei). A DNA repair protein is tagged with recombinant GFP (green). Co-localization of the DNA repair protein (green) with DNA (red) is indicated by yellow-green foci in the merged image of GFP, RGP, and DIC images.

**Image 6. Visualization of genetically different strains of the milk yeast *Kluyveromyces lactis.***

**Visualized:** Genetically different *Kluyveromyces lactis* strains can be visually identified by colony color. Cells carrying the *ade2* mutation appear pink, while cells expressing β-galactosidase gene are green.

**Methods and Techniques:** Live culture. Yeast cells carrying a mutation in phosphoribosylaminoimidazole carboxylase (*ade2*) accumulate pigment (pink to red color) These cells can be easily distinguished from cells not deprived of adenine (white color, and not shown). Yeast cells carrying β-galactosidase gene produce blue-green pigment colonies when X-gal is added to the growth media.

**Microscope:** Zeiss Stemi SV11 Stereoscope with switchable click top 0.6X magnification. Colonies were visualized with Dolan Jenner Fiber Lite A3000 light source and images were recorded using Leica HD Digital microscope camera with c-mount interface.