LIGHT SHEET BASED FLUORESCENCE MICROSCOPY (LSFM) ALLOWS LONG-TIME OBSERVATIONS OF *ARABIDOPSIS* ROOT GROWTH

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Plants are sessile and unable to move away from unfavorable changes in the environment. They have to overcome many environmental stress factors such as light, wind, temperature, water, salt and pH. Plants are very sensitive to these factors and react by metabolic adaptation involving rapid sensing mechanisms followed by specific responses ranging from cellular to systemic level. In conventional microscopy the plants suffer from mechanical stress, horizontal positioning and light. In our LSFM setting the plant is growing upright and not attached to any coverslip. Thus, we can observe the plant in its natural growth behavior. The laser light is the only stress we add and we try to keep it as low as possible by using the light sheet. In this contribution we discuss plant specimen preparation methods and show live imaging of growing roots of *Arabidopsis thaliana* expressing GFP fused to the microtubule-associated protein 4 (Hamant, Heisler and Jönsson 2008).