

Stellingen

Behorend by het proefschrift ***In Vivo Optical Projection Tomography in Biological Model Organisms***

- 1.) The technique of Optical Projection Tomography does not necessarily require optical clearing of the specimen (*this thesis*).
- 2.) In-vivo optical imaging deep inside living organisms becomes possible applying Optical Projection Tomography (*this thesis*).
- 3.) High speed Optical Projection Tomography can be realized with light field imaging techniques (*this thesis*, R. Ng et al., tech. report CTSR 2005-02, Stanford Univ., 2005.)
- 4.) In contrast to common assumptions OPT can achieve high resolution images below 20 μ m spatial resolution (*this thesis*, Dodt H.U., et al., Nat Methods, 2007. **4**(4): p. 331-6.)
- 5.) Fluorescent transgenic organisms offer the opportunity to visualize cell and tissue behavior during developmental processes at high resolution and, in real time, observations that might shed light on the dynamics that are involved in shaping a complex organism. This endeavor, however, is often limited by the technical constraints of the imaging apparatus (J. Huisken and D. Y.R. Stainier, Development 136, pp.1963-1975, 2009).
- 6.) The tremendous progress of the genome sequencing centers, combined with computational advances in algorithms for genome assembly and gene model prediction, provide the research community with valuable new resources that serve as platforms to investigate biological systems. (C.J. Bult, Targets, vol. 1, No5 Dec 2002)
- 7.) Twelve years ago, the question was asked, "Is molecular biology yet a science? The area of 3D microscopic imaging is still in its infancy, but new experimental techniques will emerge as more scientists become aware of the importance and usefulness of 3D sample preparation (J Sharpe, Annu. Rev. Biomed. Eng. 2004, 6: 209-28; J. Huisken and D.Y.R. Stainier, Development 136, 1963 – 1975 (2009)).
- 8.) What is science anyway? One misconception about science is that one is doing science when following the "scientific method". In fact, most scientists use the scientific method as a format for writing up their work and preparing proposals. Most often the "aha" experience results from inspiration born from intense discussions with colleagues or in quiet reflection. Science can be hard work. An apparently simple result may come after days, months, or even years of investigation (William A. Prothero, University of California, Santa Barbara).
- 9.) For 3D reconstruction of large specimen, large fields of view are necessary and this requires the use of objectives with low NA. These objectives have poor axial resolution, thus prohibiting 3D reconstructions with standard microscopy. (H.U Dodt, Nat Methods, 2007. **4**(4): p. 331-6.)
- 10.) Just before Sir Isaac Newton died, he described how humbled he felt by the thought that he had glimpsed only a fraction of the potential of the great scientific revolution he had helped to launch: "I seem to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or prettier shell than ordinary, while the great ocean of truth lay all undiscovered before me."
- 11.) He who breaks a thing to find out what it is, has left the path of wisdom (J.R.R. Tolkien)