The Summer Undergraduate Research Fellowship (SURF) Symposium
7 August 2014
Purdue University, West Lafayette, Indiana, USA

Electrophoresis Staining: a New Method of Whole Mount Staining

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Abstract:
Advances in tissue clearing techniques have allowed almost a ten-fold increase in the viewing depth of confocal microscopy. This allows for intact cellular structures to be rendered in 3D. However, viewing tissues to this depth is often limited to endogenous fluorescence as passive diffusion of antibodies via whole mount staining can take weeks. Our lab is developing a new method involving electrophoresis as a driving force that will promote active antibody binding deep into tissue, reducing the amount of time needed to stain for cellular structures. Due to the inherent charge within antibodies, they are able to be directionally forced through a mouse embryo which has been embedded in agarose. As the antibodies progress through the mouse embryo, they are able to bind to their epitope. Through this method, effective antibody staining of blood vessels was accomplished in a mouse embryo in a reduced amount of time in contrast to traditional staining methods, such as whole mount staining. With this new staining technique, combined with tissue clearing, complex cellular structures can be observed in intact tissues with the use of confocal microscopy.

Keywords:
Tissue Clearing, Whole-Mount Staining, Immunohistochemical Staining, Electrophoresis

References:

Liu, H., & Kao, W. A novel protocol of whole mount electro-immunofluorescence staining.*Molecular Vision*, *15*, 505-517.