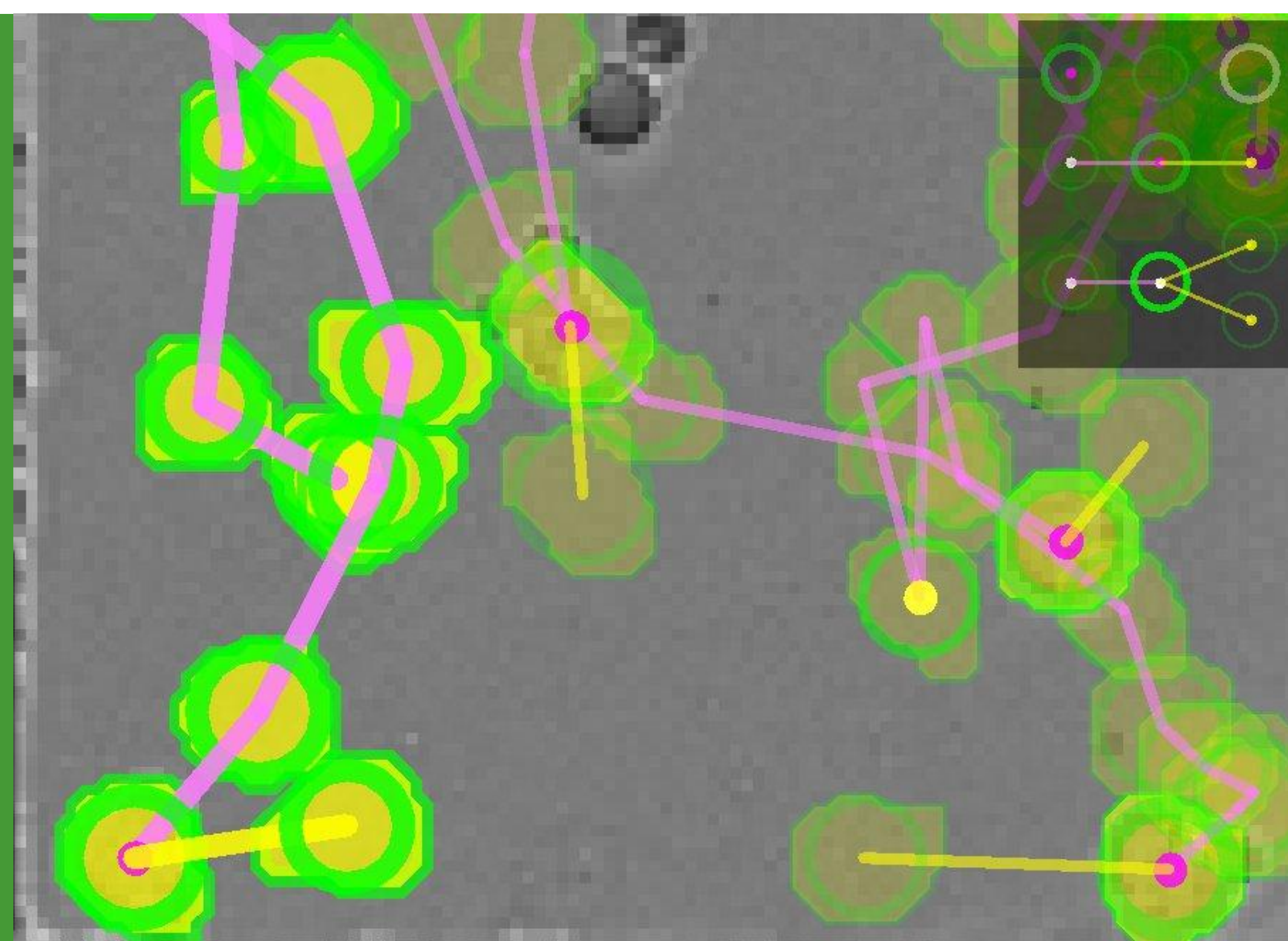


Automated Microscopic Image Analysis

We are developing software tools for tracking mobile cells in time-lapse microscopy images. These tools have the potential to save Immunology researchers thousands of hours in every experiment, greatly increasing the ambition and quantity of experiments conducted.



Problem/Opportunity

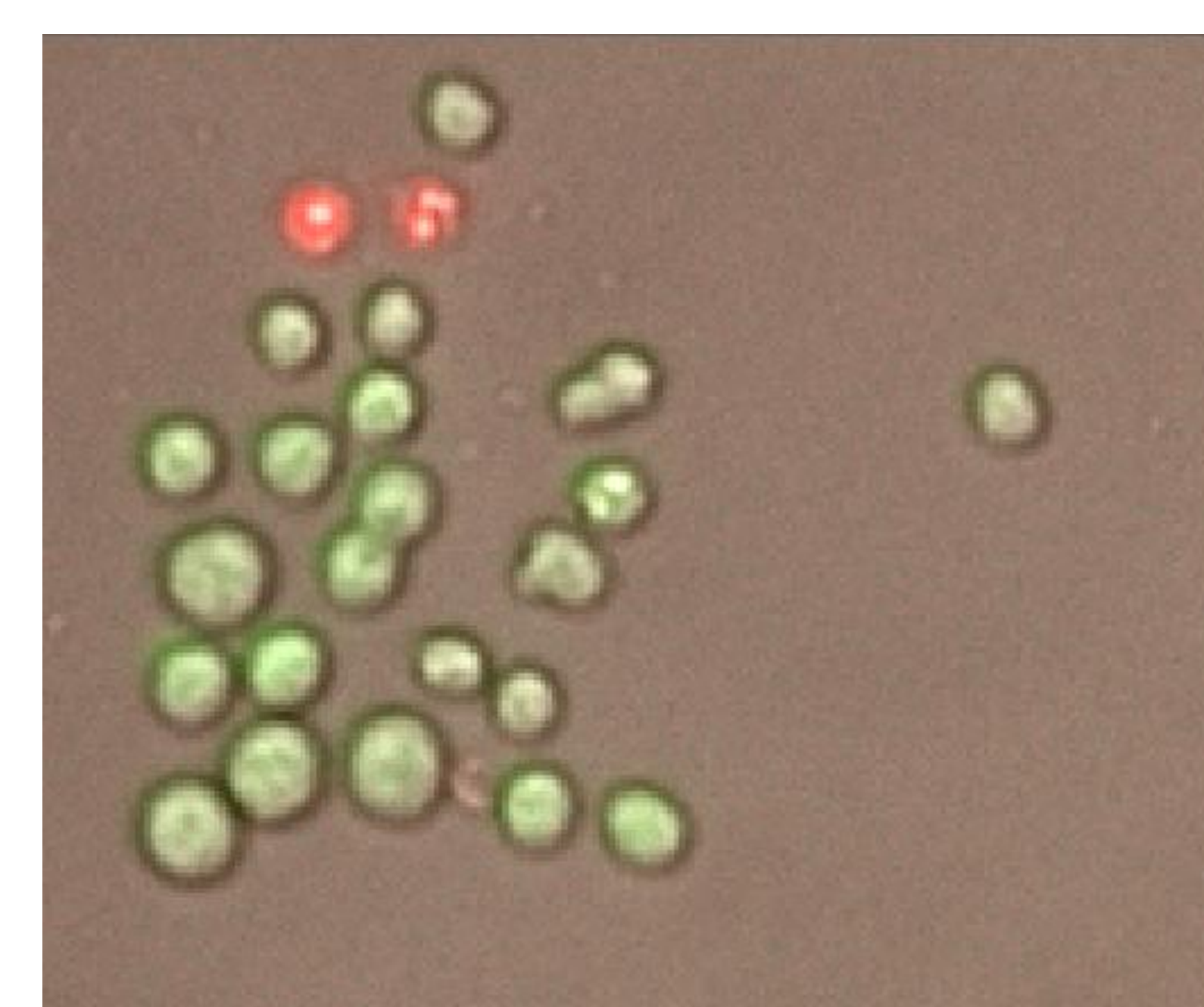
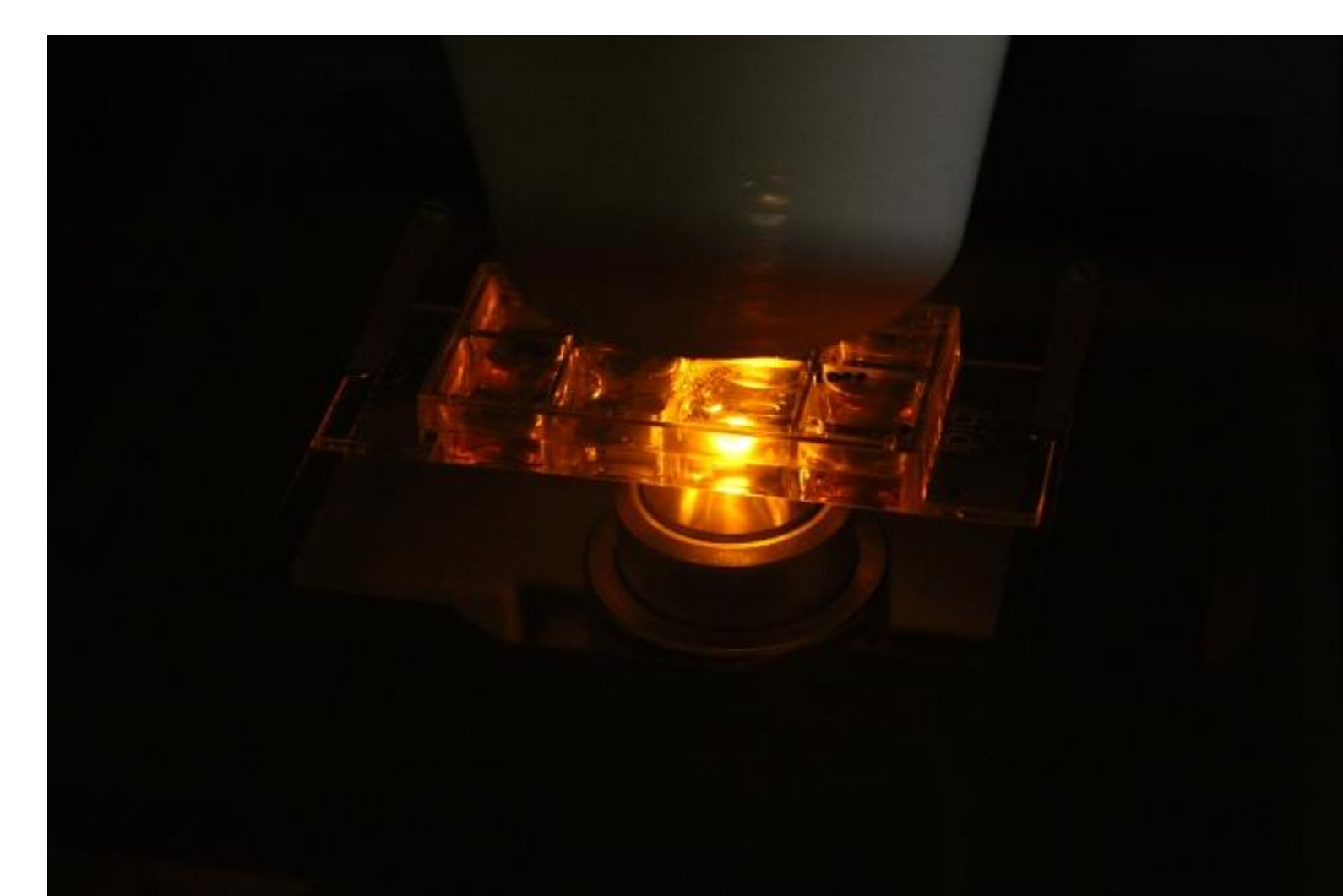
- Immunology researchers want to reconstruct the **lineages** of B-Lymphocytes, but this requires tracking every individual cell in populations of hundreds, over a period of several days
- The lineage of B-Lymphocytes is critical in determining their fates and behaviour
- This is currently a hugely time-consuming, expert manual task
- These efficiency constraints are holding back further research

Impact

- TrackAssist **software released** to WEHI collaborators, Feb. 2012
- Other Immunology groups will adopt TrackAssist for B-Lymphocyte tracking during 2012
- Now **extending to T-Lymphocyte** in collaboration with HIV research group at the Burnet Institute, Melbourne
- **Activation-Induced B Cell Fates are selected by Intracellular Stochastic Competition.**
Science, Jan. 2012
- **Automated and Semi-automated Cell Tracking: Addressing Portability Challenges.**
Journal of Microscopy, 2011
- **TrackAssist – a framework for live cell tracking, annotation & analysis.**
Hunter Valley Meeting of Cellular Biology, Mar. 2012

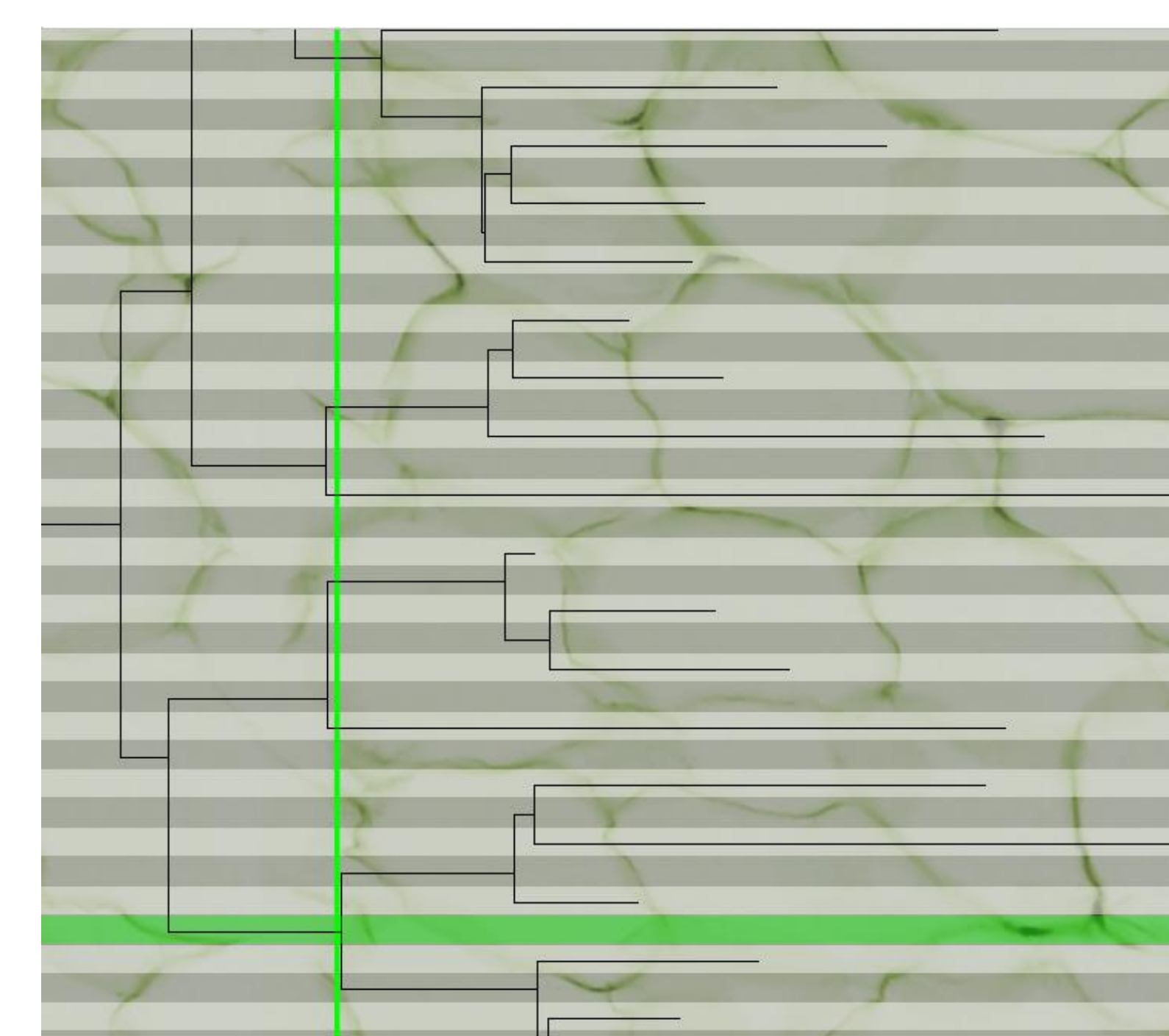
Solution or Approach

- NICTA has partnered with the Immunology Lab at Walter & Eliza Hall Institute for medical research (WEHI)
- We are combining NICTA's expertise in object tracking & image processing, with WEHI's experience of immunology modelling
- Jointly developed wet-lab imaging protocols and data-processing algorithms, for optimum results
- A specific and novel approach to Immunology, driven by WEHI's groundbreaking research



NICTA's role and next steps

- NICTA aims to become an expert centre in bio-image processing, particularly time-lapse microscopy
- We are seeking to engage with other Immunology groups to promote WEHI's vision of Immunology and NICTA's solution for this approach
- NICTA expects that the techniques developed here could be applied beyond Immunology: For example, tracking and monitoring the behaviour and lineages of stem cells.



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