# **TrackAssist**: Extracting cell lineage from Time-Lapse Microscopy

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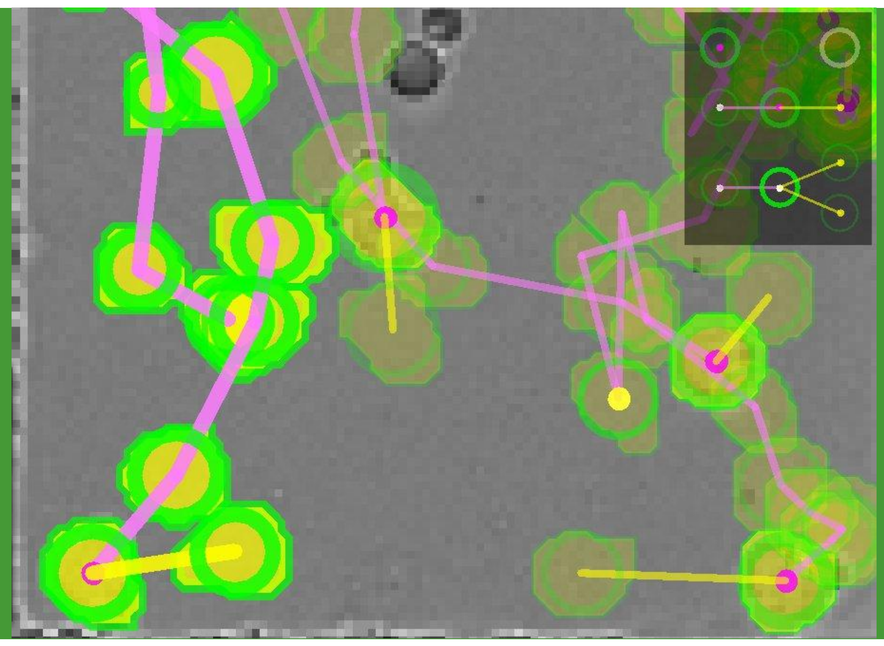
We are developing software tools for tracking mobile cells in time-lapse microscopy images.

These tools have the potential to save researchers thousands of man-hours, greatly increasing the ambition and quantity of experiments conducted.

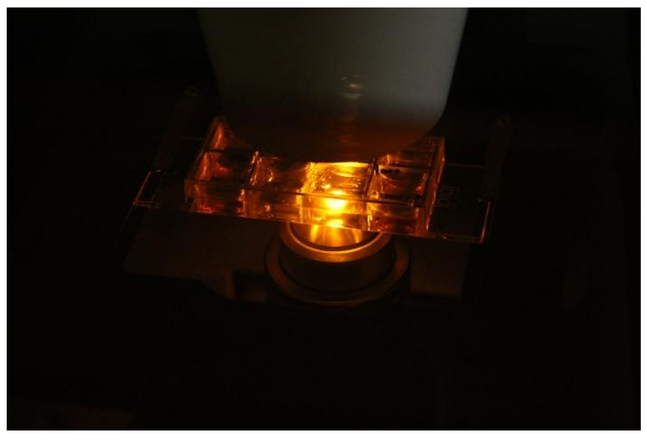


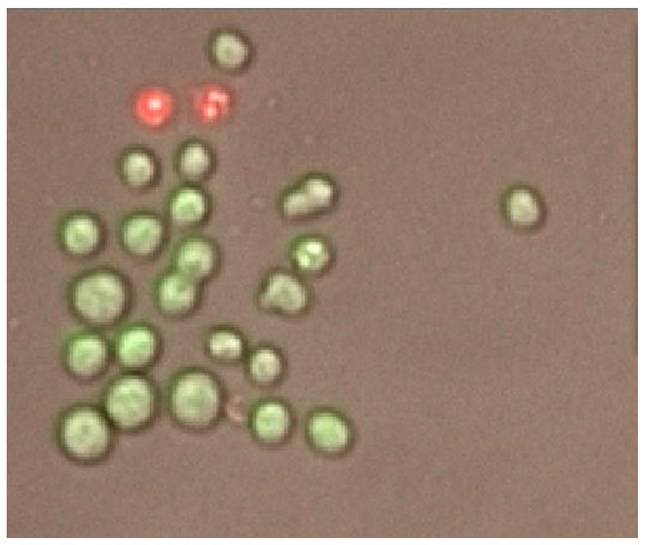
## Problem/Opportunity

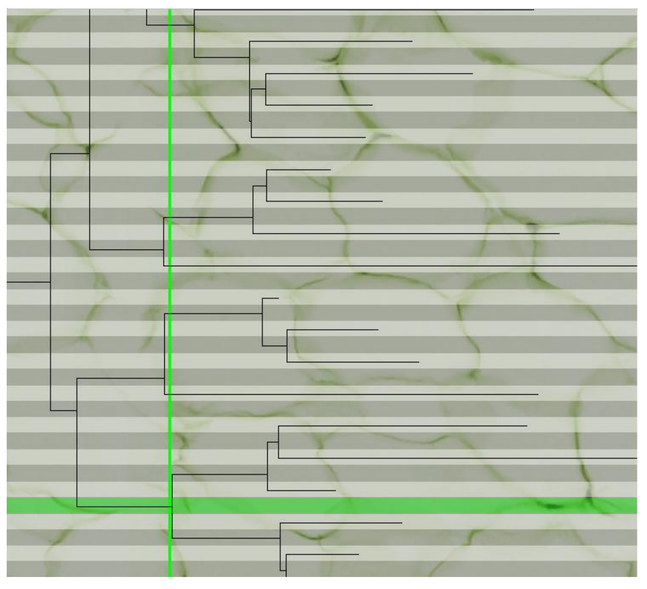
- Immunology researchers want to reconstruct the **lineages** of B-Lymphocytes, but this requires tracking every individual cell in populations of hundreds, over a period of several days
- The lineage of B-Lymphocytes is critical in determining their fates and behaviour
- This was a hugely time-consuming, expert manual task
- TrackAssist improves productivity and throughput 20x-30x on this task

## 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





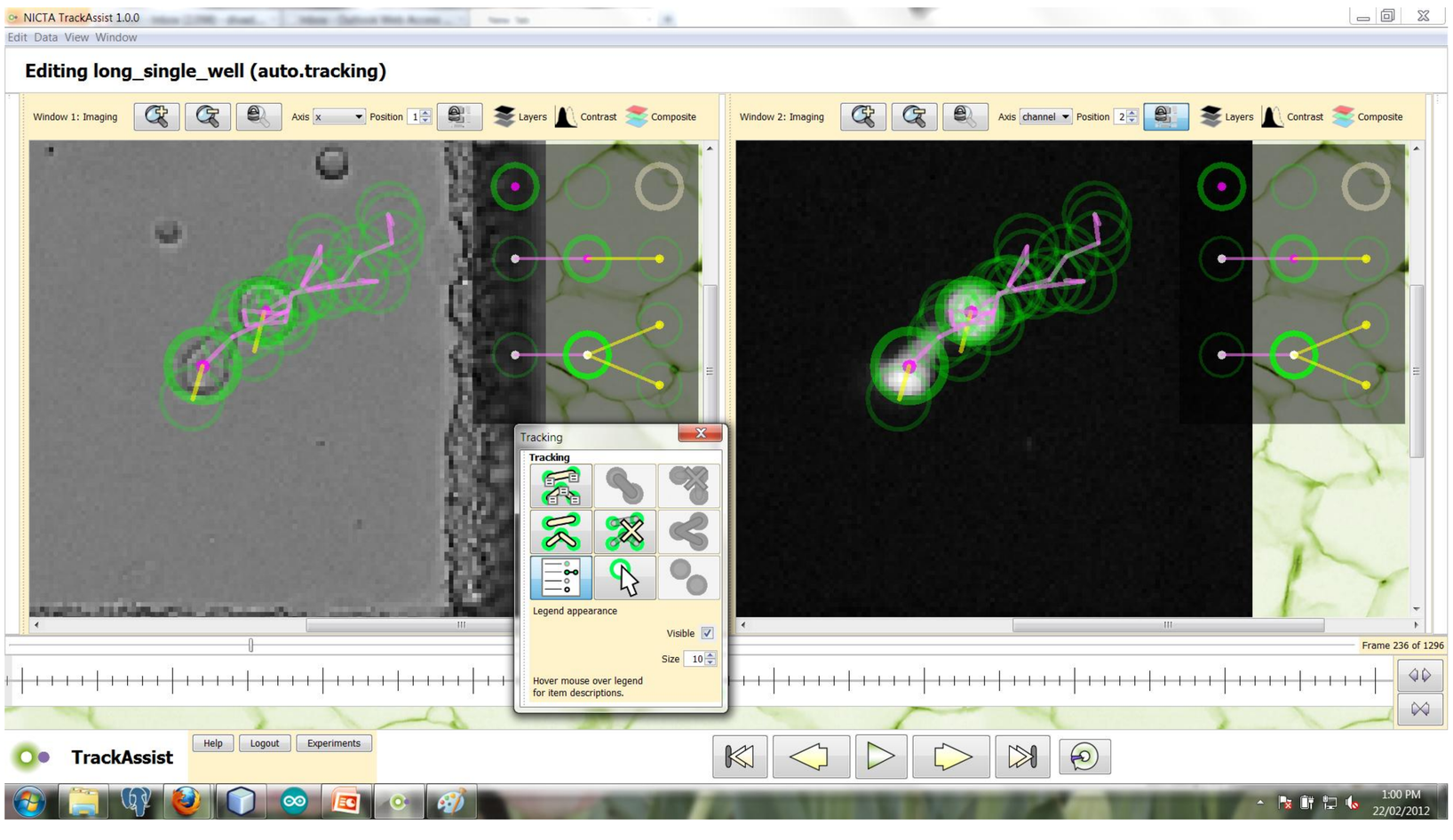


## Software Status

- 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

## TrackAssist Features

- Import bio image formats, export segmented images, tracking data & lineage to several formats (e.g. csv)
- Fully automatic cell segmentation and tracking
- Tools to manually correct or constrain detections & tracks
- Add notes & comments to imagery
- Visualization & enhancement tools




- We are seeking to engage and collaborate with other research groups who face challenging bio-imaging analysis problems

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