

# Multiplexed tissue imaging

A novel method for rapid staining and panel iteration for multiplexed tissue imaging.

## Background

Recent advances in tissue scanning technology have enabled the creation of digital images containing vast amounts of data from entire sections of human tissue. The data from these images is quantified digitally to provide detailed spatial and distribution information on multiple cell types and molecules.

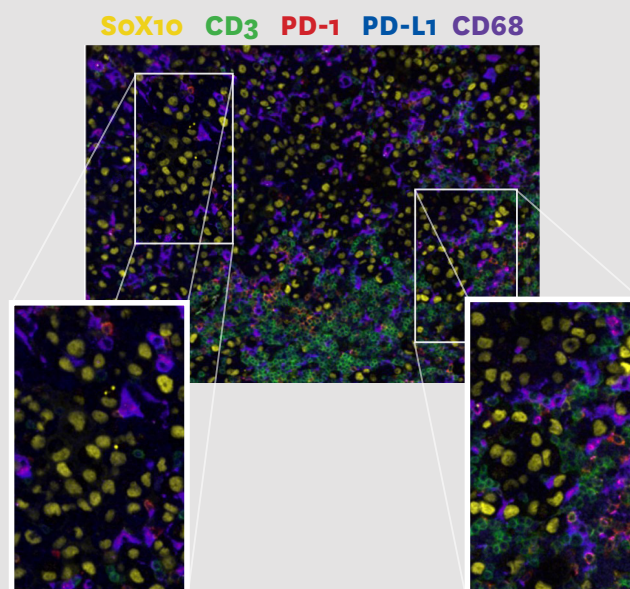
A significant rate-limiting factor for multiplexed tissue imaging is the current tissue staining protocols. These protocols are time consuming and highly prone to failure due to the technical complexity and large number of sequential steps required.

## Technology

Using a new, state-of-the-art, quantitative pathology imaging system – the PhenolImager HT from Akoya Biosciences – we have developed novel techniques for multiplexed immunohistochemistry (IHC).

Our techniques dramatically reduce the time taken for tissue staining and we can simultaneously detect at least seven markers across an entire tissue section.

We can generate new IHC panels for up to seven markers in a matter of days – this takes months with previous methods. Our techniques are suitable for both fresh frozen (FF) and formalin fixed paraffin embedded (FFPE) tissue samples.



## Major advantages

- Imaging of entire tissue sections in up to seven colours after staining for as little as one hour.
- Development of new / custom antibody panels within days.

## Applications

- Quantitative characterization and localisation of cell subsets within any tissue.
- Quantitative co-localisation of molecules to cell subsets within any tissue.
- Immune monitoring of responses in tissues to new therapies under clinical trial (e.g. immuno-oncology agents, anti-viral therapy, vaccines).
- Improved diagnostic pathology through simultaneous detection of multiple markers without the need for serial sections (e.g. co-localisation of multiple lymphoma markers).
- Improved quantification of companion diagnostic markers that determine therapy (e.g. quantification of PD-L1 expression by tumour cells and immune cells across entire tissue sections).
- Improved monitoring of patient responses to therapy (e.g. quantification of tumour-infiltrating T cell and myeloid cell subsets)

## UniServices by the numbers

Total external research funding:

**\$261.3M**

(35% increase over 2020)

**45**

companies started in the past five years

**\$1.25BN**

Total market capitalisation of companies formed

**\$73.5M**

Net asset value of the University of Auckland Inventors' Fund

**17,335** Covid-19 vaccinators trained by the Immunisation Advisory Centre in 2021

**1,700**

New Zealand teachers reskilled and upskilled through Tui Tuia | Learning Circle professional learning and development in 2021

**3,000**

clinical staff at 22 DHBs trained through teamwork-based acute care simulations designed by NetworkZ in the past five years

**14,391** times that child and youth mental health workers attended Whāraurau e-modules, trainings and workshops in 2021

## UniServices

UniServices is a not-for-profit company of the University of Auckland that champions research and ideas with the power to change the world. From seeking out and bringing together partners in academic institutions, industry and government to build new knowledge and solutions through research; to whakatupu (nurturing) and commercialising the ideas and intellectual property that arise from the University of Auckland's great minds, we act as the kaihono (those who join and link people to people, and people to projects) firmly entrenched in the ecosystem that bridges the world of academia with business, government and our communities.

## University of Auckland

Waipapa Taumata Rau | The University of Auckland is New Zealand's largest and leading university. The name Waipapa Taumata Rau, gifted to the University by Ngāti Whātua Ōrākei, refers to the 'place of many peaks' – places to strive for, ascend to and succeed. We also rank in the top 10 globally for sustainable development impact. The University supports economic growth locally and nationally through innovation and entrepreneurship, creating quality jobs and high-value businesses, and producing graduates that contribute to our economy and society for the benefit of all.

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