2023 SEA Core Facility Management Workshop

Wednesday, 1 Nov 2023 – Friday, 3 Nov 2023

Register Here

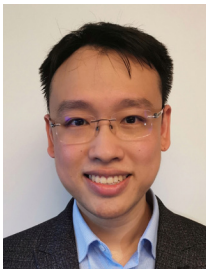
NUS,
MD1 Tahir Foundation Building
(1 & 2 Nov 2023)

Thermo Fisher Scientific
Customer Experience Center
(3 Nov 2023)

This workshop will feature seminars and small group discussions on topics such as setting up and managing an imaging and flow facility, ISO and sustainability of facilities (cost models), training and resources, data analysis and management as well as quality control and impact of facilities.

Dr. Paul Hutchinson

Prof. Thorsten Wohland



Dr. Hwang You Yi

Dr. Aravind Sivakumar

Dr. Deanna Wolfson

Dr. Graham Wright

NUS National University of Singapore | Yong Loo Lin School of Medicine

Confocal Microscopy Unit
Flow Cytometry Laboratory Unit

SingaScope

SingFLOW-SgSI

Day 1

1st November 2023, Wednesday at NUS

Time	Program		Location
08:30am – 08:50am	Registration		
08:50am – 09:15am	**Welcome Address** Prof. Hanry Yu *[Pre-recorded]* (Director of YLLSOM Confocal and Flow Cytometry Unit) Ms Joanne Koh (Sales Director, Thermo Fisher Scientific)		**LT37 (Level 3)**
09:15am – 10:00am	**From the 20th to the 21st Century: The Development of the Flow Cytometry Shared Resource Laboratory** Keynote Speaker: Dr. Paul Hutchinson (Head of Flow Cytometry lab, LSI, NUS)		
10:00am – 10:10am	Break		
10:10am – 11:00am	**Breakout Session: Equipment & Infrastructure**		
	Group A	**Group B**	
10:10am – 10:35am	Dr. Ma Xiao Xiao, Eloise (AMP, A*STAR)	Dr. Hwang You Yi (SIgN, A*STAR)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
10:35am – 11:00am	Dr. Hwang You Yi (SIgN, A*STAR)	Dr. Ma Xiao Xiao, Eloise (AMP, A*STAR)	
11:00am – 11:10am	Break		
11:10am – 12:00pm	**Breakout Session: ISO, Safety & Funding**		
	Group A	**Group B**	
11:10am – 11:35am	Keshmarathy D/O Sacadevan (Advanced Bioimaging Core, SingHealth)	Ivy Low (SIgN, A*STAR)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
11:35am – 12:00pm	Ivy Low (SIgN, A*STAR)	Keshmarathy D/O Sacadevan (Advanced Bioimaging Core, SingHealth)	
12:00pm – 01:30pm	Lunch		
01:30pm – 02:15pm	**Training in Bioimaging for Different Purposes** Keynote Speaker: Prof. Thorsten Wohland (Director, CBIS, NUS)		**MPSH 1 (Level 3)**
02:15pm – 02:30pm	Break		
02:30pm – 03:20pm	**Breakout Session: Training for Core Facility Staff and Users**		
	Group A	**Group B**	
02:30pm – 02:55pm	Tong Yan (CBIS, NUS)	Wang Xiaoning (YLLSOM, NUS)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
02:55pm – 03:20pm	Wang Xiaoning (YLLSOM, NUS)	Tong Yan (CBIS, NUS)	
03:20pm – 03:50pm	Break		
03:50pm – 04:50pm	**Breakout Session: Equipment Maintenance**		
	Group A	**Group B**	
03:50pm – 04:15pm	Yang Chen (CBIS, NUS)	Guo Hui (LSI, NUS)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
04:15am – 04:50pm	Guo Hui (LSI, NUS)	Yang Chen (CBIS, NUS)	
04:50pm	Closing		

Day 2

2nd November 2023, Thursday at NUS

Time	Program		Location
09:00am – 09:30am	**Considerations of a Core Facility: From a National Shared Platform Perspective** Keynote Speaker: Dr. Hwang You Yi (Head of Flow Cytometry Platform, SIgN, A*STAR)		**MPSH 3 (Level 3)**
09:30am – 10:00am	**Evolution of Microscopy in Modern Research: Adapting to a New Era of Biological Exploration** Keynote Speaker: Dr. Aravind Sivakumar (RSC, A*STAR)		
10:00am – 10:10am	Break		
10:10am – 11:00am	**Breakout Session: Data Analysis & Data Management**		
	Group A	**Group B**	
10:10am – 10:35am	Dr. Radek Machan (NOBIC, NTU)	Angela Hu (Analytical Instruments, Thermo Fisher Scientific)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
10:35am – 11:00am	Angela Hu (Analytical Instruments, Thermo Fisher Scientific)	Dr. Radek Machan (NOBIC, NTU)	
11:00am – 11:10am	Break		
11:10am – 12:00pm	**Breakout Session: Measuring Facility Impact**		
	Group A	**Group B**	
11:10am – 11:35am	Dr. Esther Koh Geok Liang (LKC Medicine, NTU)	Dr. Paul Hutchinson (LSI, NUS)	**Group A - Seminar Room (Level 5)** **Group B - Seminar Room (Level 6)**
11:35am – 12:00pm	Dr. Paul Hutchinson (LSI, NUS)	Dr. Esther Koh Geok Liang (LKC Medicine, NTU)	
12:00pm – 01:30pm	Lunch		
1:30pm – 1:50pm	**Microscopy Development Cluster as a Collaboration-Driven Pseudo-Core Imaging Facility** Keynote Speaker: Dr. Deanna Wolfson (Group Leader of Ultrasound, Microwaves and Optics, UiT The Arctic University of Norway)		**LT37 (Level 3)**
01:50pm – 03:20pm	**Panel Discussion: Experience Sharing**		**Seminar Room (Level 5)**
03:20pm	Facility Visit		

Day 3

3rd November 2023, Friday at Thermo Fisher Scientific Customer Experience Centre

Time	Program	
08:45am – 09:00am	Arrival of Guests	
09:00am – 09:15am	Welcome Address	
09:15am – 10:00am	**Combining and Leveraging Experience and MBA Training for Scientific Service and Core Technology Platform Provision to Support Academia and Industry Research** Keynote Speaker: Dr. Graham Wright (Director of RSC and AMP, A*STAR)	
10:00am – 10:30am	**Easily Upgrade your Flow Cytometry Data with Brightfield Images using the Attune CytPix Flow Cytometer** Speaker: Nicholas Chia Product Manager, Cell Analysis, SEA Biosciences Division	
10:30am – 11:00am	**Publication-quality Cell Imaging using the EVOS Imaging System** Speaker: Xie Wei Product Manager, Cell Analysis, SEA Biosciences Division	
11:00am – 11:15am	Break	
11:15am – 12:35pm	**Hands-on Session**	
	Group A	**Group B**
11:15am – 11:55am	Flow Cytometry	Cell Imaging
11:55am – 12:35pm	Cell Imaging	Flow Cytometry
12:35pm – 01:50pm	Lunch	
01:50pm – 01:55pm	**Group Photo**	
01:55pm – 02:25pm	**The Art of Modern High Throughput Protein Analysis - Western Blotting and Immunoassays** Speaker: Lew Tian Sheng Product Manager, Protein Analysis, SEA Biosciences Division	
02:25pm – 02:55pm	**Key Applications on Multimode Detection with Microplate Reader and Cellular Assays** Speaker: Nicholas Chia Product Manager, Cell Analysis, SEA Biosciences Division	
02:55pm – 03:10pm	Break	
03:10pm – 04:30pm	**Hands-on Session**	
	Group A	**Group B**
03:10pm – 03:50pm	Protein Analysis	Multimode Detection
03:50pm – 04:30pm	Multimode Detection	Protein Analysis
04:30pm	Closing	

Day 1

Keynote Speakers

Dr. Paul Hutchinson

FROM THE 20TH TO THE 21ST CENTURY: THE DEVELOPMENT OF THE FLOW CYTOMETRY SHARED RESOURCE LIBRARY

Flow cytometry is one of the original single cell measuring technologies, and has been used by Life Science researchers since the 1970s. Because of their expense and relative complexity it has not been uncommon for flow cytometers to be grouped together at the same location and operated by dedicated staff in a Shared Resource Laboratory. I have been working in Flow Cytometry Shared Resource Laboratories (aka Core Labs) since 1983, and in this talk I will discuss how the operation and needs for these Shared Resource Facilities have developed in the past 40 years and what I believe the future is for them.

Prof. Thorsten Wohland

TRAINING IN BIOIMAGING FOR DIFFERENT PURPOSES

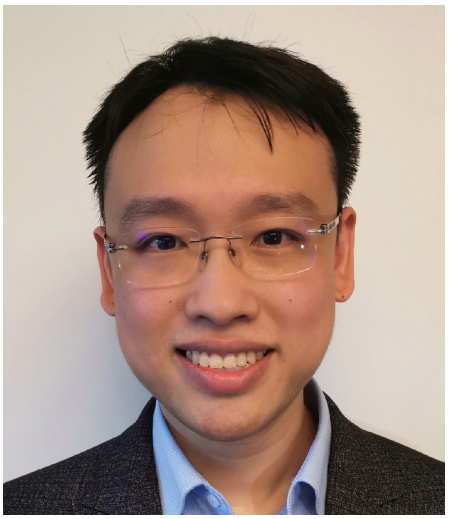
Bioimaging is widely used in the life Sciences and training is required on many different levels, from high school students over undergraduates to graduates and facility managers. Each level has di erent aims and challenges. In this talk I share my own experience in teaching at these di erent levels. I will introduce some ways I try to motivate younger students and get them interested in the field, to more pragmatic teaching for graduates to actual manpower training of facility staff, with an emphasis on the latter. Facility mangers themselves are both teachers, as they have to constantly train users, and learners, as they need to keep up with the most recent technology and methodologies. Coming from my own experience, I nevertheless hope that this talk can provide both perspectives, the teacher's and the learner's.

Day 2

Keynote Speakers

Dr. Hwang You Yi

CONSIDERATIONS OF A CORE FACILITY: FROM A NATIONAL SHARED PLATFORM PERSPECTIVE



The SIgN Flow Cytometry Platform is a national platform providing instrument access and project agreement services to A*STAR, academic and industrial biomedical scientific researchers.

This talk will cover an overview of considerations applicable to core facilities and share how the SIgN Flow Platform addresses some of these issues.

Dr. Aravind Sivakumar

CONSIDERATIONS OF A CORE FACILITY: FROM A NATIONAL SHARED PLATFORM PERSPECTIVE

In the annals of biological research, microscopy cores have been foundational, established during a time when exploration was driven by sheer curiosity. These cores were pivotal in analyzing and understanding biological systems, from DNA and proteins to carbohydrates and lipids. The primary focus was on observational and qualitative analysis. However, the research landscape has undergone a significant transformation. Curiosity-driven research is on the decline, replaced by a more structured and quantitative approach. Today's research emphasizes physiological relevance mapping, quantitative microscopy, and perturbation studies in multiple model systems. This shift has imposed new challenges on graduate students and postdocs, who must now juggle mastering microscopy with big data experiments, statistics, and more. Moreover, the demographics of the research community are changing, with engineers, physicists, and clinician scientists entering the biological research arena. As research becomes increasingly translational, universities are tasked with molding a new generation of researchers.

This talk will delve into the changing dynamics of research, the evolving role of microscopy cores, and how renowned institutions like Cornell, UPenn, and Harvard Medical School are navigating these changes with emphasis on lessons to be learnt from their experience.

Day 2

Keynote Speakers

Dr. Deanna Wolfson

MICROSCOPY DEVELOPMENT CLUSTER AS A COLLABORATION-DRIVEN PSEUDO-CORE IMAGING FACILITY

Groups which develop new technologies can be a valuable supplement or alternative to core facilities. At UiT The Arctic University of Norway, the Ultrasound, Microwaves, and Optics (UMO) Research Group is one such supplement, with a dozen advanced commercial and self-developed optical microscopes available for use through collaborations. There are no user or instrument fee; Instead, the resources are supported through joint grant applications, typically building on small pilot projects with interested parties.

A key to our success has been close pairing of personnel from different fields, where each learns from the other and they share in experimental tasks, thus gaining a better understanding of the advantages and limitations of the other side. This has enabled our pseudo-core facility to grow from one large initial grant supporting two instruments and one main biological collaborator in 2014 to approximately 20M€ of cumulative microscopy-related research funding with applications ranging across arctic marine biology, pathology, engineered heart tissue, antimicrobial resistance, and reproductive health, amongst others. Although the group's focus is research and development, and it is not intended as a service/user support, we have found a highly beneficial symbiosis with our biological partners.

A major challenge is personnel capacity, particularly since many of the instruments require a skilled operator, and collaborators often want additional support with experimental design, labeling, and image analysis. As this microscopy cluster has grown independently of university direction and without formal designation, there similarly isn't official support for its operations. Thus, a balance needs to be struck with which projects and users we accept and the available time for pilot projects and user training. This presentation will discuss how we have navigated this challenge, including some examples of which projects have been successful, the interplay between developing technologies and addressing biological questions, and the balance of resources.

Day 3

Keynote Speakers

Dr. Graham Wright

COMBINING AND LEVERAGING EXPERIENCE AND MBA TRAINING FOR SCIENTIFIC SERVICE AND CORE TECHNOLOGY PLATFORM PRIVISION TO SUPPORT ACADEMIA AND INDUSTRY RESEARCH

With a background in biomedical research I took a conscious decision to move into core facilities management at the end of my PhD, rather than undertake postdoctoral research. I feel I have been fortunate to have combined my interests whilst building a career in microscopy and facilities management which, in time, led to a decision to pursue an MBA as my role became more senior, less hands-on with microscopy (which I do miss) and more about the proper administration and management of core facilities.

My more recent appointment as the Director, Research Support Centre in A*STAR allows me to bring my experience and training together for the oversight and coordination of a wide-range of core facilities across a large research organisation, including mass spec, flow cytometry, histopathology, etc.

These facilities have the aim of supporting not only A*STAR's research but also that of the wider research ecosystems in Singapore across both the public and private sector. This has led to the networking of capabilities across the major research players in Singapore – for example SingaScope, bringing together the leading microscopy platforms (across A*STAR, NUS, NTU and SingHealth) to provide open access to valuable microscopy instrumentation and expertise.

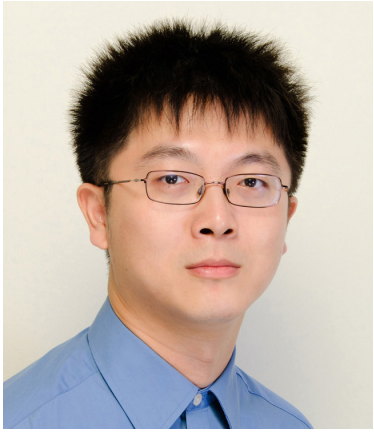
In this presentation, I will explore career development, roles and initiatives and consider what I draw on from experience and formal training and where the combination has proven relevant and useful.

Day 3

Facilitators' Profile

Wei XIE

Product Manager, Cell Analysis,
SEA Biosciences Division



Xie Wei received his PhD from Temasek Life Sciences Laboratory (TLL) in National University of Singapore in 2010, with the study on the protein folding quality control and ubiquitin-proteasome system mediated degradation. He then joined Institute of Medical Biology (now Skin Research Institute of Singapore), Agency of Science Technology and Research (SRIS, A*STAR) as a Research Fellow, and started working on a human disease called progeria (commonly known as pre-mature aging).

During his career in TLL and A*STAR, he has acquired solid experiences in cell and molecular biology, protein synthesis and analysis, and advanced microscopic techniques. Xie Wei has joined Thermo Fisher Scientific in March 2021 as Product Manager, covering the portfolio of Protein and Cell Analysis products.

Tian Sheng LEW

Product Manager, Protein Analysis,
SEA Biosciences Division

Tian Sheng graduated with a PhD from the Department of Microbiology and Immunology in the National University of Singapore in 2021. He accumulated 7 years of experience working in a virology laboratory, with interests in vaccine development, as well as elucidating the role of host factors in affecting viral replication in a multitude of RNA viruses such as enteroviruses, dengue virus and zika virus.

In 2020, he joined Innoquest Diagnostics, leading COVID-19 diagnostic laboratories to meet the demands of national testing with high accuracies. He then joined Thermo Fisher Scientific in 2022 as a Product Manager, bringing with him extensive knowledge to support users in a wide range of applications within the protein analysis portfolio.

Nicholas CHIA

Product Manager, Cell Analysis,
SEA Biosciences Division

Nicholas graduated with a MSc from the School of Biological Sciences in the Nanyang Technological University in 2017. He accumulated 8 years of research experience working in various disciplines, including immunology and neurosciences. In 2020, he took on a Research Biologist position to focus on drug discovery and assay development. He then joined Thermo Fisher Scientific in 2022 as a Product Manager, bringing with him extensive knowledge to support users in a wide range of applications within the flow cytometry and detection portfolio.