

The WEHI Proteomics facility: tools, techniques and technologies

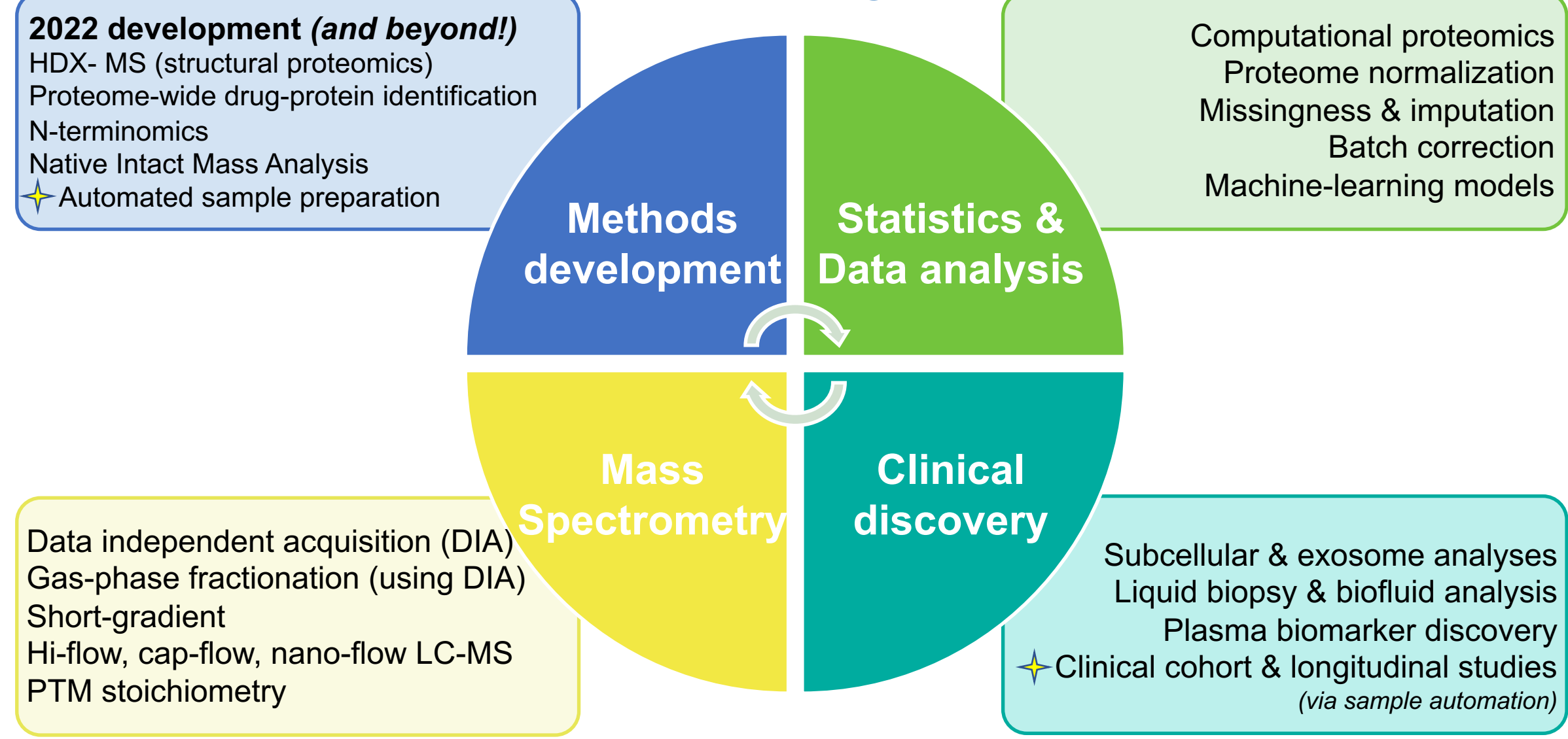
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We provide the latest mass spectrometric instrumentation for researcher-led exploration, identification & quantification of proteins and peptides. Since 2021 we have hired 5 new staff specialising in mass spectrometry-based proteomics. From experimental design and sample preparation, to data analysis and statistical evaluation, our staff can undertake a broad range of proteomic experiments which are cost-recovered for internal users at a WEHI-subsidised hourly rate and fully cost-recovered for external users. Since implementing these changes we have processed over 9500 samples which have been submitted by 70 collaborating labs (43 internal, 22 external) across 381 projects. We have also overseen 64 developmental projects, which include method development, totalling over 2000 hours towards expanding proteomic workflows at WEHI.

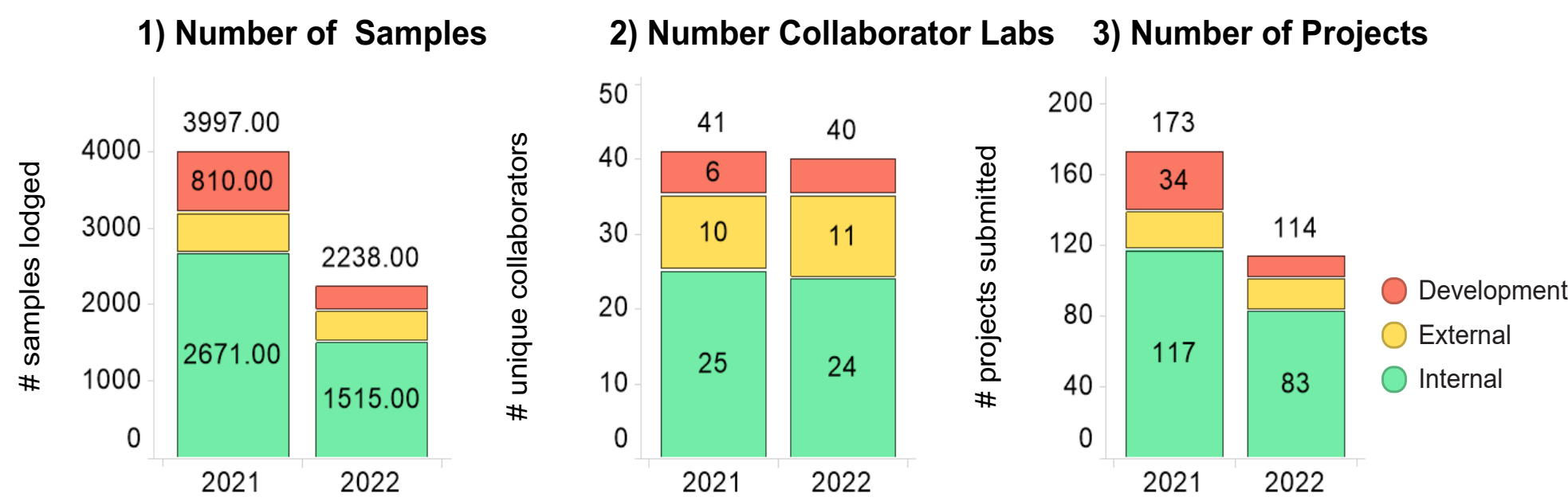
Current research projects / research interests



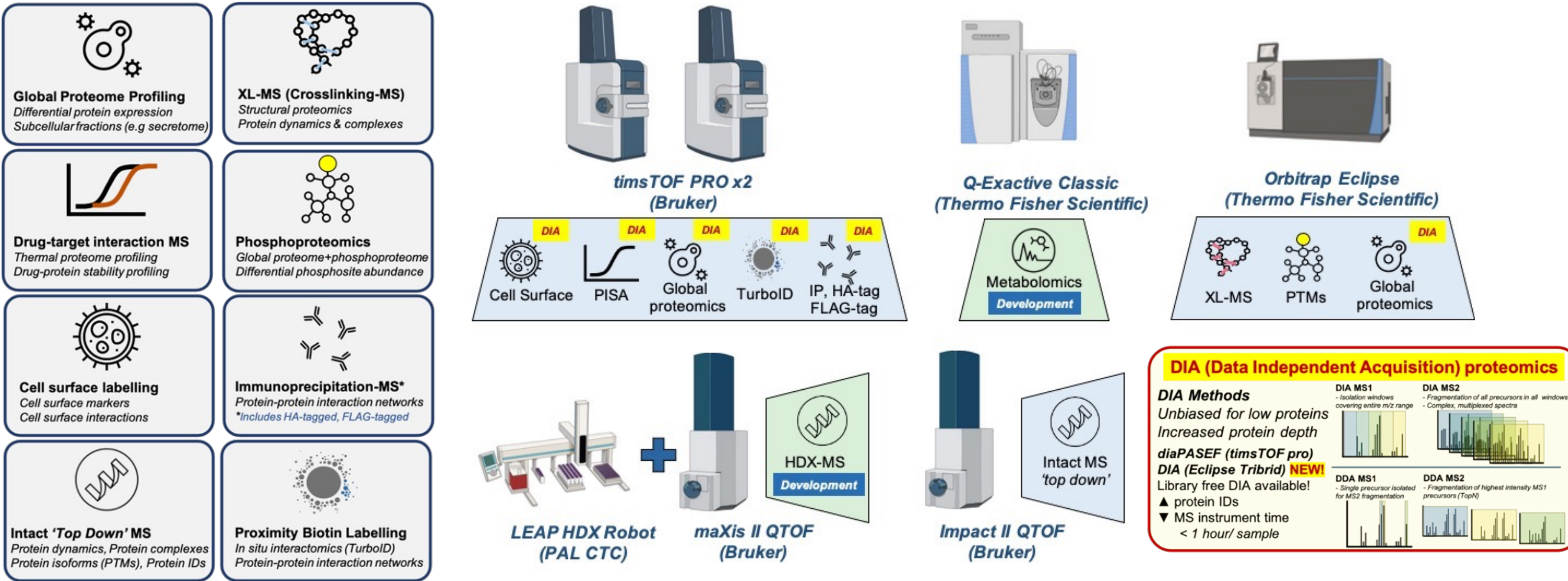
At WEHI Proteomics we offer a wide range of workflows that we are seeking to expand through multiple in-house research projects which drive our **methods development**. These are reliant on what we consider our key research interest, which is our **mass spectrometry** technologies and platform.

Since 2021 we have included computational proteomics as part of our services, which has accelerated our research in proteomic **statistics and data analysis**.

Notably, WEHI Proteomics has maintained a strong track record in contributions for **clinical discovery**, towards fast-tracking translation.



Technologies, techniques, and instrumentation



Outreach and outputs



WEHI proteomics facility staff have authored over 71 publications with both internal and external collaborators in the last 5 years, including 9 first/co-first author contributions. We predominantly work with academic institutes from across Australia, but also offer fee-for-service research for commercial organisations.

Services offered by WEHI Proteomics

1. MS Sample Preparation

WEHI Proteomics staff prepare sample for proteomic analysis. Users need only provide cell pellets, biofluids (e.g. plasma), or lysates.

Our services include:
Protein quantitation (e.g. BCA), sample enrichment (e.g. streptavidin affinity purification, exosome enrichment), TPP (thermal proteome profiling), C18 cleanup/desalting, phosphopeptide enrichment. Users can also be trained, or perform sample preparation supervised by facility staff.

2. MS Instrument Acquisition

Samples are queued, injected and analyzed on one of our 6 mass spectrometers, and MS spectra are collected for proteome analysis.

Our Instruments include:
2 x timsTOF pro (Bruker)
1 x Eclipse Orbitrap Tribrid (Thermo)
1 x QExactive Classic (Thermo)
1 x maXis QTOF (Bruker) (HDX/Intact only)
1 x Impact II QTOF (Bruker) (Intact Only)

3. Proteomics Data Analysis

We have an in-house biostatistician (Dr Jumana Yousef) who assesses all data and undertakes statistical analyses (differential expression)

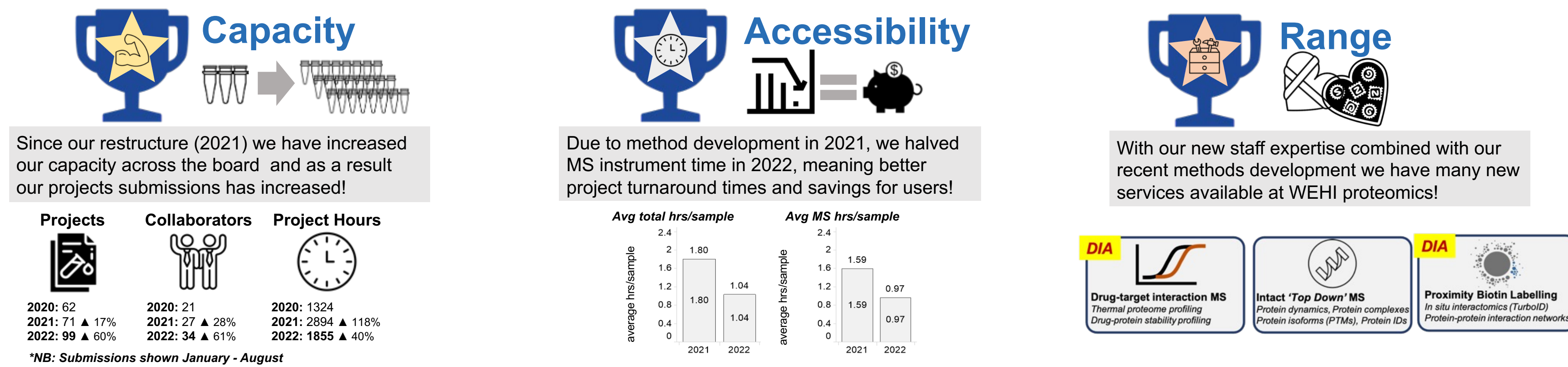
Our routine data analysis includes:
• R markdown document of all steps in analysis
• Interactive Spotfire document of all results
We also undertake additional analyses on request including timecourse analysis, k-means clustering, correlation analysis, GO enrichment & more!

Since 2021, the Proteomics Facility charges an hourly rate for time spent by facility staff on **1) sample preparation, 2) MS instrument time and 3) data analysis**. Our hourly rate is subsidised 40% by WEHI for all internal researchers.

Note, we don't charge for pre-project meetings, **but we encourage them!**

Users should reach out to discuss future experiments before they begin collecting samples so we can help with experimental design and ensure the best results!

Recent achievements



Meet the team

Dr. Laura Dagley: Facility manager
BBIomedSc (Hons) Melbourne, PhD Melbourne

Dr. Samantha Emery-Corbin: Deputy facility manager
BSc (Hons), PhD Macquarie University

Dr. Toby Dite: Protein PTM specialist
BBIomed (Hons) Melbourne, PhD Melbourne

Dr. Subash Adhikari: Drug-target identification specialist
MolBiotech (MSc) Uni Bonn, PhD Macquarie University

Dr. Jumana Yousef: Bioinformatician/Statistician
Statistics (MSc) NMSU, Bioinformatics (MSc) Melbourne, PhD Monash

Dr. Vineet Vaibhav: Clinical and general proteomics
BSc BHU, Biotechnology (MSc) IIT Bombay, PhD Macquarie University

Contact

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