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| A picture containing graphical user interface  Description automatically generated | **Accelerator Showcase 25th September 2023***open to industry and academia* |

*Accelerating our ability to understand and target complexity and heterogeneity in cancer through automated imaging of 3D cancer models including patient derived organoids*



[**www.mach3cancer.org**](http://www.mach3cancer.org)

Understanding the complex heterogeneous cellular behaviours within tumours, where initially identical clonal cells can mutate and adapt to diverse microenvironments, is vital to understand drug resistance but this complexity is rarely addressed in standard assays that typically measure the average response of cell populations in highly artificial contexts. While there is increasing interest in more complex 3D tissue models, such as patient-derived organoids (PDO) that better recapitulate the complexity of the in vivo context, increasing the complexity of 3D cancer models makes them harder to image – and conventional assay readouts often fail to capture the information available, e.g., concerning the outlier cells that may drive drug resistance. Our Accelerator project aims to develop modular open-source automated 3D imaging instrumentation providing quantitative single cell resolved time-lapse assays of complex cell cultures at throughput. As well as implementing new open microscope capabilities, we are exploring cost-effective approaches to 3D cell culture and sample preparation to enable more researchers to address their specific cancer biology questions.

At this meeting we will present our progress implementing quantitative single cell resolved time-lapse assays of spheroids and organoids using oblique plane microscopy (OPM) at our 5 partner institutions and discuss progress developing a novel multibeam, multiphoton multiwell plate microscope (M3M) to extend the imaging depth of 3D assays, e.g, for imaging larger organoids and tissue slices, including with fluorescence lifetime imaging (FLIM) readouts.

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| **MONDAY 25TH SEPTEMBER*****FRANCIS CRICK INSTITUTE****, SEMINAR ROOM 4 GROUND FLOOR. 1 MIDLAND RD, LONDON NW1 1AT* |
| **Time** | **Item** | **Presenter** |
| 12:00-12:20 | Introduction to MACH3Cancer CRUK Accelerator project | Paul French |
| 12:20-12:40 | Introduction to oblique plane microscopy (OPM) and status of OPM instruments within Accelerator project | Chris Dunsby |
| 12:40-13:00 | M3M: Multibeam multiphoton mutiwell-plate FLIM microscope for deeper imaging in 3D cancer models | Sunil Kumar & William Flanagan |
| **13:00-13:45 Lunch** |
| 13:45-14:15 | Applying OPM to the study of patient-derived triple negative breast cancer organoids | Erik Sahai & Colin Ratcliffe (Francis Crick Institute) |
| 14:15-14:45 | Development of OPM assays for 3D high-content analysis and drug screening in glioblastoma spheroids | Neil Carragher, Jayne Culley & Martin Lee (University of Edinburgh, CRUK Scotland Centre) |
| 14:45-15:15 | Towards lineage tracing in colon cancer organoids to study tumour plasticity with OPM | Eduard Batlle & Theresa Suckert (IRB Barcelona) |
| 15:15-15:45 | Using transformers to analyse 3D image data | Chris Bakal (Institute of Cancer Research) |
| **15:45-16:00 Break** |
| 16:00-17:00 | Laboratory tours and discussion with Accelerator team  | Accelerator team and guests |
| 17:00-17:30 | Discussion of user (including industry) and patient perspectives  | All |
| **17:30 Networking and discussion** |

Please register your attendance [here](https://www.eventbrite.co.uk/e/accelerator-showcase-convergence-science-centre-invitees-tickets-705299127677?aff=oddtdtcreator). For access into the building, each attendee *must* register individually.