Thomas Hartwell

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RESEARCH INTERESTS

Virology and RNA biology, with a focus on how chronic viral infection reshapes host-cell regulation. My doctoral work asks how Kaposi sarcoma-associated herpesvirus (KSHV) alters the circular RNA landscape of infected endothelial cells, and whether those changes can be developed into diagnostic markers or therapies for Kaposi sarcoma. I am interested in mechanotransduction as a route into this question, particularly Hippo/YAP-TAZ signalling, and in building culture systems that represent human disease more faithfully than conventional monolayer culture.

EDUCATION

PhD, Future Medicine Programme, University of Edinburgh *(2026–present)*
Institute for Regeneration and Repair. Supported by a philanthropic donation.

Supervisors: Dr Carsten Gram Hansen (Gram Hansen Lab, Institute for Regeneration and Repair), Dr Takanobu Tagawa (Tagawa Lab, Ashworth Laboratories, King's Buildings), Dr Ailsa Oswald (TRACC clinical lecturer, Cancer Research UK Scotland Centre).

Thesis topic: circular RNA regulation in KSHV-infected endothelial cells, and circRNA biomarker discovery for Kaposi sarcoma.

MRes Tropical Health and Infectious Disease Biology, Liverpool School of Tropical Medicine *(2026)*
Research focus: glycoRNA biology and host-cell signalling during Zika virus infection.

- Biology of Tropical Health, Pathogens and Vectors of Disease – 78%
- Methods in Tropical Disease Research – 65%

BSc Biochemistry, University of Manchester *(2024)*
Upper second class honours (2:1, 66.6%). Honours project: 79% (first class).

Selected modules: Molecular & Cellular Biology (73%), Chemistry of Biological Processes (73%), Genome Maintenance & Regulation (70%), Biochemistry Essay Paper (75%), Protein Assembly, Dynamics & Function (65%), Cell Adhesion (63%), Protein Sorting (62%), Glycobiology: Glycan Function in Health & Disease (59%), Cell Signalling (57%).

RESEARCH EXPERIENCE

Doctoral researcher – University of Edinburgh *(Oct 2026–present)*

- Propagating and titrating KSHV from the iSLK-BAC16 producer line, including doxycycline- and sodium butyrate-induced lytic reactivation and virus concentration by ultracentrifugation.
- Establishing a KSHV-infected endothelial model in the iTIME.219 reporter line, with flow cytometry to quantify latent and lytic reporter populations.
- Culturing and banking primary human endothelial cells (HUVEC, HDLEC) for infection studies in two- and three-dimensional formats.
- Assessing Hippo pathway pharmacology in infected endothelial cells by phospho-specific western blot and SYBR Green qPCR.
- Developing proliferation and migration readouts for transformed phenotype using live-cell imaging (Incucyte SX5) and impedance-based real-time cell analysis.
- Contributing to the group's circular RNA sequencing programme, including long-read methods for full-length circRNA profiling and viral circRNA detection pipelines.

MRes research project – Liverpool School of Tropical Medicine *(Jan–Sep 2026)*

- Investigated how glycoRNA biogenesis influences host-cell signalling and Zika virus infection phenotypes.
- Designed and validated CRISPR-Cas9 sgRNAs targeting the glycoRNA biogenesis factors DTWD1 and DTWD2 using lentiCRISPRv2 workflows.
- Performed cloning, bacterial transformation, colony PCR, plasmid purification and sequencing validation.
- Produced lentiviral particles, transduced A549 cells and generated pooled knockout populations under antibiotic selection.
- Carried out ZIKV infections and quantified infection phenotypes by immunofluorescence imaging and image analysis.
- Optimised aptamer-based rolling circle amplification proximity ligation assay (ARPLA) and metabolic labelling with SPAAC chemistry to localise glycoRNA in fixed infected cells.

Undergraduate honours project – University of Manchester *(Jan–May 2024)*

- Investigated diurnal regulation of caecal mucus production and glycosylation during Trichuris muris infection.
- Worked with wild-type and Muc2-iCre:Bmal1 mice to assess goblet cell-intrinsic circadian regulation.
- Performed paraffin embedding, microtome sectioning, periodic acid-Schiff staining and Muc2 immunofluorescence.
- Conducted lectin profiling and slot-blot analysis with Li-Cor imaging, and prepared samples for LC-MS proteomics.
- Correlated glycosylation changes with worm burden and infection outcome.

TECHNICAL SKILLS

Virology: KSHV propagation, lytic reactivation and titration; iSLK-BAC16 and iTIME.219 reporter systems; ZIKV infection assays; lentiviral production and transduction; viral concentration by ultracentrifugation; work under antibiotic selection

Cell culture: Mammalian tissue culture; primary human endothelial cells (HUVEC, HDLEC); immortalised endothelial lines; cryopreservation and cell banking; three-dimensional and hydrogel culture

Molecular biology: CRISPR-Cas9 sgRNA design and cloning; restriction digestion, ligation, colony PCR and sequencing validation; RNA extraction; SYBR Green qPCR; SDS-PAGE and phospho-specific western blot

RNA biology: Circular RNA enrichment and profiling strategies, including RNase R and RPAD approaches and long-read sequencing methods; glycoRNA detection by ARPLA and metabolic labelling (SPAAC)

Imaging and analysis: Confocal microscopy (Zeiss Cell Discoverer 7); live-cell imaging (Incucyte SX5); immunofluorescence; flow cytometry; histology and lectin-based glycan profiling

Software: ImageJ/Fiji, GraphPad Prism, Geneious, MacVector

LEADERSHIP AND ADDITIONAL EXPERIENCE

Officer Cadet – Manchester and Salford Universities Officer Training Corps *(Nov 2022–Jul 2024)*
Led training exercises under pressure and developed disciplined decision-making under time constraint.

General Secretary and Social Secretary – University of Manchester Hiking Club *(2022–2024)*
Managed committee operations and budgeting, and organised large group events in upland terrain.

ADDITIONAL QUALIFICATIONS

- Mountain Leader Qualification
- Outdoor First Aid (16 hours); First Aid at Work (Level 3); National Pool Lifeguard Qualification
- ABRSM Piano Grade 8; ABRSM Trumpet Grade 6

CONFERENCES AND PROFESSIONAL ACTIVITY

- Sarcoma UK Early Career Researchers Networking Event, London, September 2026 – attended.