

LOW

HIGH

BASIC RESEARCH HOST-VIRUS INTERACTIONS

DRUG DISCOVERY AND REPURPOSING

VACCINES

	APPLICATION	TECHNOLOGY	APPLICATION	TECHNOLOGY	APPLICATION	TECHNOLOGY	
IN VITRO	DNA/RNA	Viral Presence Genome Sequence Mutations	qPCR/ qRT-PCR NGS Sample Prep and Sequencing		Quality control of mRNA vaccine	Capillary electrophoresis	
	PROTEIN	Viral Protein Analysis	• SDS-PAGE, Electrophoresis • Capillary Electrophoresis	Viral (Polymerase) Enzyme inhibition Quality control of antibody drugs	• Alpha • HTRF • Radioimmunoassay Capillary electrophoresis	Virus binding by antibodies Quality control of AAV or protein based vaccines	• Alpha • HTRF Capillary electrophoresis
	PROTEIN-PROTEIN INTERACTIONS	Interactions between viral and host cell proteins	• Alpha PPI reagents • HTRF PPI reagents	Receptor binding assay PPI Inhibition	• Alpha PPI reagents • HTR PPI reagents		
CELL-BASED	HOST CELLS	Viral Titer	• Plaque/ Focus Forming Imaging • TCID50 • qPCR	Viral Titer	• Plaque/ Focus Forming Imaging • TCID50 • qPCR	Viral Titer	• Plaque/ Focus Forming Imaging • TCID50 • qPCR
		Host Cell Viability	• ATPlite Luminescence • Immunofluorescence and HCS • Live-cell Imaging	Host Cell Viability	• ATPlite Luminescence • Cell counting • Live/dead imaging • Alpha • HTRF	Virus Neutralization by antibodies	• Plaque Reduction Neutralization Test (PRNT) • Virus Reduction Neutralization Test (VRNT) • Reporter Gene Assay / BriteLite • HCS • Alpha • HTRF
		Understand the Viral Life Cycle Attachment and entry Genome integration Assembly	• Cell-cell fusion HCS • Alpha PPI reagents • HTRF PPI reagents	Virus proliferation	• Live-cell Imaging/Transfection • Reporter gene assay / BriteLite • High-Content Phenotypic Assay • qPCR • Alpha • HTRF	Innate antiviral response T-cell / B-cell activation Cytokine detection Immunglobulin production	• Alpha • HTRF
		Essential Host Cell Factors	• CRISPR/ Cas9 • siRNA Screening	Cell-cell fusion/Syncytium formation	HCS		
		Susceptible Cell Types	• Immunofluorescence and HCS • Live-cell imaging	Virus RNA replication	dsRNA HTRF Assay		
		Antiviral Response	• Alpha • HTRF				
ORGANOIDS	Cell tropism and Infection phenotype	Immunofluorescence and HCS					
	Cytokine release	• Alpha • HTRF					
IN VIVO	ANIMAL MODELS	Organ tropism	In vivo Imaging	Drug efficacy/Virus proliferation	• In vivo Imaging • In vivo biomarker detection • qPCR	Vaccine efficacy	• In vivo Imaging • In vivo biomarker detection • qPCR
		Viral pathogenesis Inflammation Antiviral immune response	• In vivo Imaging • In vivo biomarker detection	Drug toxicity and biodistribution Emergence of resistant mutants	• Custom radiolabelling • Radiometric detection NGS	Vaccine toxicity and biodistribution Emergence of resistant mutants	• Custom radiolabelling • Radiometric detection NGS

PHYSIOLOGICAL RELEVANCE

THROUGHPUT

HIGH

LOW