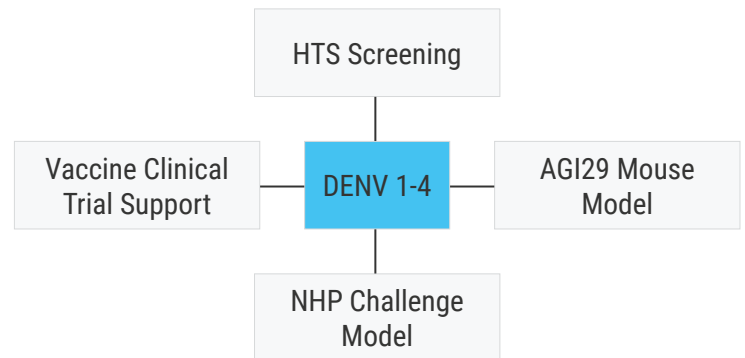


Dengue Virus Vaccine and Therapeutic Testing

OUR EXPERTS ARE READY TO SUPPORT YOUR DENGUE VIRUS TESTING NEEDS

Southern Research (SR) provides a full range of services to support pre-clinical and clinical development of your DENV program. We use clinically relevant DENV 1-4 serotypes isolated from Dengue fever (DF) and dengue hemorrhagic fever (DHF) subjects. Our dengue *in vivo* capabilities include challenge efficacy studies in AG129 mice and cynomolgus macaque models. Additionally, we provide clinical *in vitro* immunology and virology assays to support Phase 1-3 dengue vaccine studies.

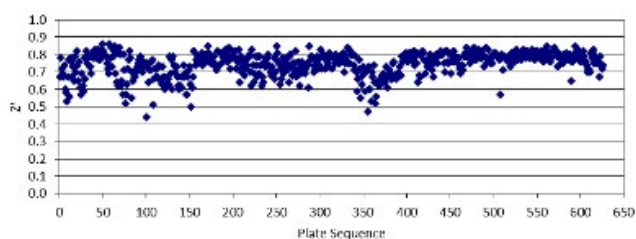


HIGH-THROUGHPUT SCREENING AND ASSAY SUPPORT

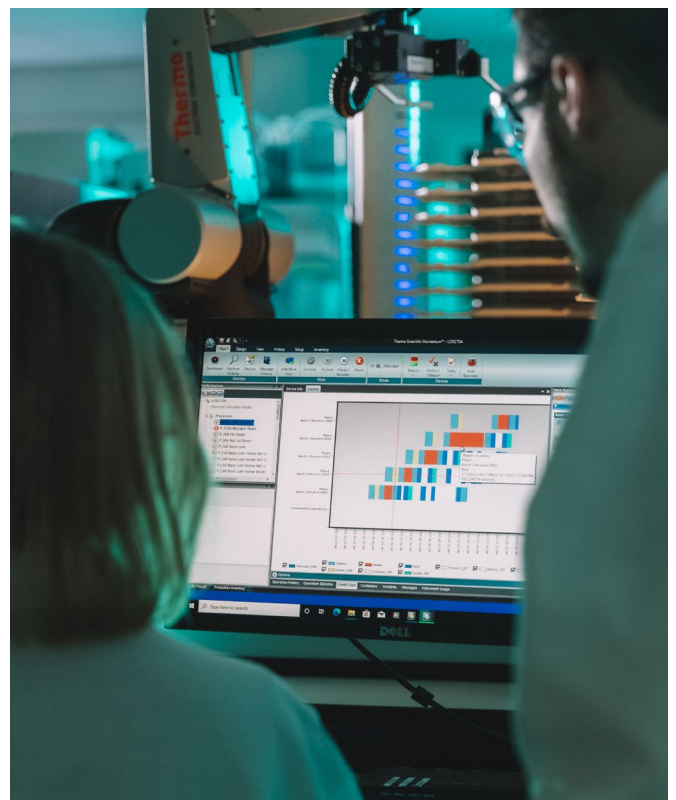
SR can assist your program in the identification and characterization of compounds active against Dengue, including small molecules, peptides, and antibodies. Our high-throughput methods can also provide value for efficient processing of large numbers of multiple sample types.

Support for Full Screening Campaigns:

Southern Research has screened more than 285,000 compounds for anti-Dengue activity using robust high-throughput methodologies^{1,2}.

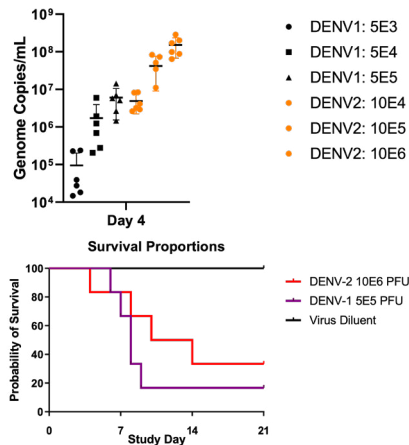


Quality performance of a cell-based anti-Dengue screen as measured by Z'. 200,000 compounds were run in this campaign of 625 384-well plates.



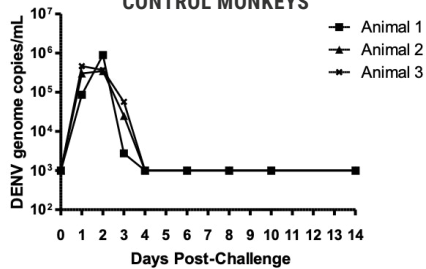
DENGUE ANIMAL MODELS

AG129 MICE (IFN $\alpha/\beta/\gamma$ R-/-) SERUM VIRAL LOAD (4 DPI)



NON-HUMAN PRIMATE (CYNOMOLGUS MACAQUES)

WILD TYPE DENV-4 CHALLENGE IN MOCK-VACCINATED CONTROL MONKEYS



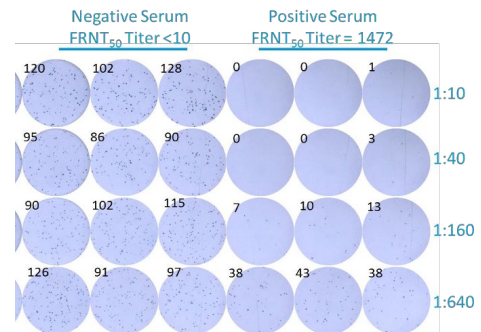
CLINICAL SAMPLE TESTING SERVICES

- o Focus Reduction Neutralization Test (FRNT) against DENV1-4
- o DENV1-4 Serotype Specific RT-qPCR
- o ELISPOT Assays with DENV serotype specific peptides
- o Plaque and CPE-based assays
- o Established SOPs and assay acceptance criteria
- o Freezerworks clinical sample management platform

DENV 1-4 ISOLATES CURRENTLY AVAILABLE

- o DENV-1 Hawaii (BEI, NR-82)
- o DENV-1 West Pac, AAN06982
- o DENV-1/03135 (originally isolated from 7 YOD DF patient in Thailand 2003)
- o DENV-2 NGC (BEI, NR-51427)
- o DENV-2 Asia-1, 16681
- o DENV-2/99345 (originally isolated from 10 YOD DHF patient in Thailand 1999)
- o DENV-3 Philippines/H87 (BEI, NR-80)
- o DENV-3, CH53489
- o DENV-3/16562 (originally isolated from subject with DHF, Philippines 1964)
- o DENV-4 H241 (BEI, NR-86)
- o DENV-4 TVP-376
- o DENV-4/1036 (isolated from a patient with DF in Indonesia in 1976)

VALIDATED FRNT ASSAY FOR DENV 1-4



RT-QPCR CHARACTERIZATION GC VS PFU (DENV-4)

