

Using the FLEXstation to investigate voltage-gated calcium and sodium channels.

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Voltage-gated ion channels play an important part in biological systems. Assays were developed to analyze voltage-gated calcium and sodium channels.

The human neuroblastoma cell line IMR32 has been used to investigate calcium ion channels either by electrophysiological or fluorescent techniques. However, the methods used have tended not to be for high-throughput. Using the FLEXstation, a medium throughput assay was developed using IMR32 cells labeled with either Fura-2 or Fluo-4. Following validation of the assay, it was subsequently used to screen a 50,000 compound library.

Neuroblastoma cell lines have also been used to study voltage-gated sodium channels. In another assay strategy, the Molecular Devices Membrane Potential Assay Kit was used to develop an assay for sodium channels. Following labeling of cells with the dye, sodium channels were opened with veratridine and the resulting change in membrane potential was measured as a change in fluorescence. The assay was validated by inhibiting the signal with tetrodotoxin and a range of other sodium channel blockers. The method is suitable for screening compound libraries either with a FLEXstation or a FLIPR.