

NuvoGen Research

Company Profile

[NuvoGen Research, LLC](#) of Tucson develops new approaches to drug discovery with a recent focus on high throughput microarray genomics and proteomics. NuvoGen makes use of the new approaches for specific cancer targets. Partners, Richard Kris and Stephen Felder, founded the company in 1997.



Current work. With the help of an SBIR grant, NuvoGen is preparing 25,000 novel plant and fungal extracts and fractions from the Sonoran desert never before available for screening. Focus of the SBIR is discovery of compounds for recurrent prostate cancer by targeting expression of 30 genes of the androgen receptor pathway. The extracts will then be available for future projects.

Projects Completed

1536-Well Screening. The company's first big project was to develop high throughput screening systems for SIDDCO, Inc. of Tucson. This consisted of instrumentation and process development for cell-based fluorescence and luminescence assays to be done in 1536-well plates. Screening at this very high density was novel at the time.

ArrayPlate. The largest product from NuvoGen Research was the ArrayPlate technology, a process for performing high throughput screening using patterns of gene expression as the readout. This allows screening for compounds that affect the transcription of a group of genes (directly or indirectly), while testing for effects on control genes at the same time. Founders, Drs Kris and Felder, are the co inventors and authors of the two umbrella patents for the technology, US 6,232,066 and US 6,238,869.

The ArrayPlate technology was sold to HTG, Inc. ([High Throughput Genomics](#)), started in 1997. It remains the major IP platform for HTG, and it has been licensed to several large and mid-sized pharmaceutical companies including Merck & Co., Sanofi-Aventis, and Takeda Pharmaceutical Company Limited of Japan. NuvoGen Research retains the right to use ArrayPlate for cancer research.

SQUIRT Plate Washer. NuvoGen recently developed an instrument for washing unbound material from high density microplates. Drs. Kris and Felder needed a plate washer for microarray assays done in 1536-well plates - and couldn't find one that worked. They showed that an out-of-the-box approach to washing would rinse the tiny wells (similar to tiny test tubes) much more reliably than old designs. All other plate washers use many fine needles for rinsing and aspirating from individual wells. The fine needles can clog and can miss wells. The SQUIRT design uses a knife-edge stream of buffer sprayed across the plate and a stream of air to displace buffer from the wells. Development was partially supported by Phase I and Phase II SBIR grants from the NSF.

Nuvogen Research signed an exclusive license agreement with [Matrical, Inc.](#) to manufacture and market the [SQUIRT](#). The washer will be marketed as a generic plate washer used for microplates of any density and for biochemical or cell-based assays. It also remains critical for NuvoGen's in-house research projects with high throughput microarray assays.

Future Work

Nuvogen Research is putting together a management team and research scientists to develop a new group of companies focused on related projects. The parent company will help raise funds, coordinate projects, and provide redundant functions. The daughter companies will focus on individual projects. The scientists will form a science advisory board for the group as a whole and hold equity in the parent and in their own daughter companies.

The structure will speed development of cutting-edge companies built from academic projects, and it is designed to develop a stable group of companies to share risk and reward. The group will work on several projects at different developmental stages so that the success of an individual project won't impact the overall success of the group. Most importantly, the structure promotes cross-fertilization of ideas. Scientists from each daughter company will be committed to the success of the group, with advisory sessions serving to review projects and foster new ideas.

Management

Stephen Felder, PhD - Partner

Richard Kris, PhD - Partner

Drs. Felder and Kris have spent a combined 40 years in academics, small biotechnology companies and large pharmaceutical companies as scientists and managers. Dr. Felder was trained in Molecular Biology and Biophysics and Dr. Kris in Molecular Biology and Immunology.

Drs. Kris and Felder first met as postdoctoral fellows at the Weizmann Institute of Science studying the molecular mechanisms of cellular activation by the EGF Receptor and other tyrosine kinases. Dr. Kris and his coworkers produced antibodies used in the functional analysis of the EGF Receptor as a protein tyrosine kinase. His group also developed antibodies marketed for anti-cancer treatment by inhibition of kinases, and sequenced several seven-helix domain receptors. Dr. Felder and his coworkers used biophysical techniques to study the intracellular trafficking and mechanism of activation of the EGF receptor, and cloned two seven-helix domain receptors.

Roughly 12 years ago they were united again as Director and Senior Scientist in the Department of Molecular Pharmacology at Selectide Corporation of Tucson, where they focused on developing methods of ultra high-throughput drug screening to complement Selectide's expertise in Combinatorial Chemistry. Since then they have focused on developing approaches to drug discovery by developing novel assays, and novel instrumentation.