

Custom G4 Microarrays can Determine a Large-scale Ligand Binding Selectivity

High-throughput drug screening platform for G-quadruplex DNA targets in cancer and undruggable genes.

Researchers at Purdue University have developed new custom G-quadruplex (G4) microarrays for determining ligand-binding selectivity of potential drugs on a large-scale. The G4 is a novel secondary structure of DNA that are formed in guanine-rich genomic regions and have potential as drug targets. G4s are especially important drug targets because they provide a means of addressing otherwise undruggable targets. As one example, MYC is an important oncogene that is not amenable to targeting by traditional drug design; however, its regulation involves a G4 that is a potential drug target. Purdue researchers have created a high-throughput unbiased microarray platform to observe binding affinity and selectivity of drugs targeted to G4s like the G4 involved in MYC regulation. In testing, the new microarray was able to systematically assess binding of proteins, small molecules, and antibodies in more than 25,000 potential G4 sequences.

Advantages:

- High-Throughput
- Unbiased
- Accurate

Potential Applications:

- Drug Discovery
- Cancer Treatment

Technology Validation:

The microarray has been tested with proteins, small molecules, and antibodies against more than 25,000 potential G4 sequences.

Technology ID

2020-YANG-69054

Category

Pharmaceuticals/Pharmaceutical
Packaging & Delivery Systems
Pharmaceuticals/Computational
Drug Delivery & Nanomedicine
Chemicals & Advanced
Materials/Materials Processing &
Manufacturing Technologies

View online page



Recent Publication:

"Custom DNA Microarrays Reveal Diverse Binding Preferences of Proteins and Small Molecules to Thousands of G-Quadruplexes"

Journal of American Chemical Society Chemical Biology

DOI: 10.1021/acschembio.9b00934

TRL: Pharmaceuticals

Intellectual Property:

Provisional-Gov. Funding, 2020-04-28, United States

Utility-Gov. Funding, 2021-04-27, United States

CON-Gov. Funding, 2024-04-26, United States

Keywords: Arrays, Cancer Drug, Chemistry and Chemical Analysis, DNA, Drug Development, Drug Discovery, high throughput, Medicinal Chemistry, Micro-Array, Molecular and Genetic, Molecular Biology, Molecular Chemistry, Molecule Reactions, Pharmaceuticals