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Inventors

Joshua LaBaer

Contact

Jovan Heusser
jovan.heusser@skysonginnovations.com

DNA Barcodes to spatially locate proteins on surfaces and three dimensional scaffolds

In many core biotechnology applications, such as protein microarrays and three dimensional scaffolds/nanostructures, it is important to assemble proteins in a specific location on a surface or in a particular order. This is important with protein arrays as it may be useful to test a series of proteins against a particular ligand or patient sample, and this is useful in 3D nanostructures because arranging proteins in a particular order may allow them to be linked in series, as in a biochemical pathway. Printing proteins can address some of these needs, but it has limitations, particularly when proteins need to be in close proximity, such as in the narrow space at the bottom of a well. Moreover it may be beneficial to produce the protein using specific in vitro extracts, such as a lysate from human cells.

Prof. Joshua LaBaer at the Biodesign Institute of Arizona State University has developed a unique method for controlled spatial localization of proteins on a surface or scaffold. This method uses DNA bar codes that are attached to proteins for targeting proteins to a specific location on a scaffold or surface. This enables rapid self-assembly of different proteins at specific locations on a surface or scaffold without the need to print proteins. Moreover, this is compatible with cell free production of proteins, which can be accomplished in very high throughput.

This rapid self-assembling method offers a novel and easy means to target different proteins to specific locations on a surface. It is very high throughput and alleviates the problems found in other means for placing proteins.

Potential Applications

- Controlled spatial localization of proteins for:
 - Protein microarrays
 - 3D nanostructures
 - Multi-enzyme protein assemblies
 - Generation of artificial biosynthetic pathways

Benefits and Advantages

- Compatible with cell free production of proteins
- High throughput
- Proteins can be placed in close proximity
- Rapid and easy

For more information about the inventor(s) and their research, please see :

[Dr. Labaer's departmental webpage](#) [Dr. Labaer's research webpage](#)

