# Pipeline for the Production of Bivalent Synthetic Antibodies to the Human Proteome

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**Inventors**

**John Chaput**
Assistant Professor
The Biodesign Institute
Arizona State University

**Joshua LaBaer, MD**
Director, Center for Personalized Diagnostics
The Biodesign Institute
Arizona State University

**Mitch Magee**
Assistant Research Professor
The Biodesign Institute
Arizona State University

**Ji Qiu**
Associate Research Professor
The Biodesign Institute
Arizona State University

## Invention Description

Despite revolutionary advances in genomics and the study of gene expression, the majority of the encoded proteins have functions that are unknown. The next great challenge for biological research is to understand the function of all proteins; this is particularly important because most diseases are the result of protein dysfunction, and nearly all therapeutics target proteins. Current methods of studying protein function rely on techniques that detect or evaluate individual proteins, but next generation tools will need to operate on thousands of proteins.

Multivalent affinity reagents have much potential for capturing proteins for study; however, previous attempts to scale them to a high throughput platform have been unsuccessful. Researchers at the Biodesign Institute of Arizona State University have developed a high throughput method to produce bivalent DNA synbodies (synthetic antibodies). By first identifying and expressing human kinases in bacteria, these target proteins can then be used to generate the DNA synbodies.

After the candidate synbodies are characterized, the resulting affinity reagents can be produced on a large scale and distributed. This ability to produce affinity regents inexpensively and on a large scale has the potential to greatly accelerate the study the cause of disease and the search for therapeutic medicines.

## Potential Applications

- High throughput production of antibodies
  - for the human proteome
  - for veterinary and other proteomes

## Benefits and Advantages

- High throughput method dramatically increases speed and lowers cost of producing antibodies, with high quality control
- No animals or multiple rounds of screening are required
- The resulting synbodies
  - have high affinity and high specificity
  - are small, robust, and easy to store
  - are compatible with existing assays
  - can be produced in perpetuity
- The information or "blueprint" to produce any synbody can be easily transferred or disseminated

**Intellectual Property Status:**
*Patent Pending*

## Contact

*Tom Goodman, PhD*

Director

Business Development, Life Sciences

Arizona Technology Enterprises, LLC (AzTE)

P: 480.884.1648

F: 480.884.1984

TOMGOODMAN@AZTE.COM

HEALTHSCIENCES@AZTE.COM