An innovative platform for quick and flexible joining of assorted DNA fragments

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Background:

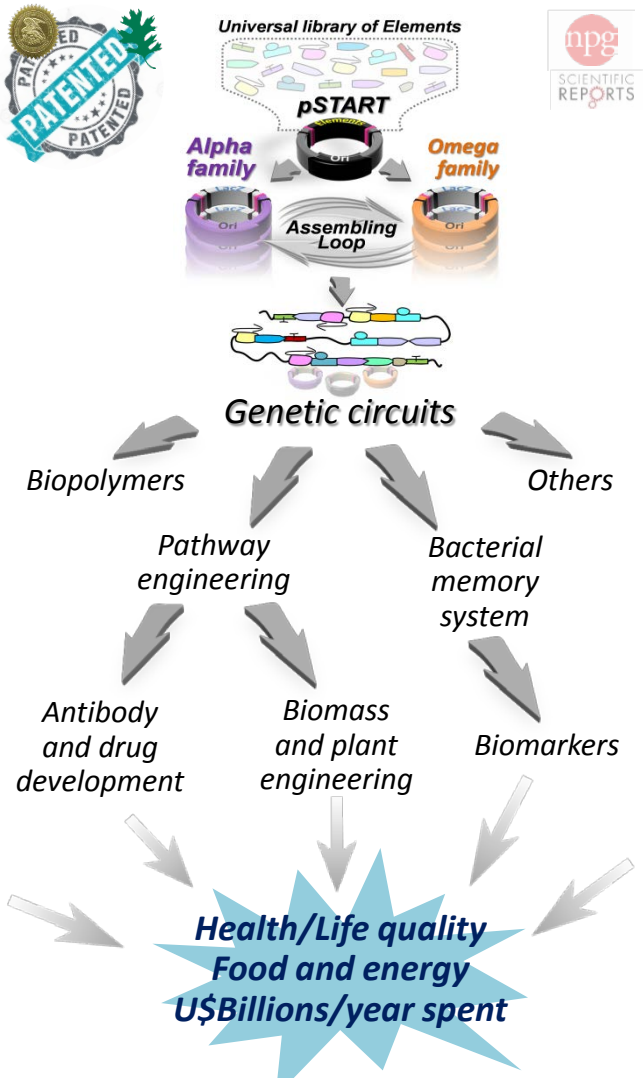
In order to understand and engineer complex traits, as photosynthesis biodesign, molecular cloning tools for flexible, efficient and reliable assembling of multigene constructs from smaller DNA parts are required. Currently, several limitations hinder the speed, fidelity and flexibility of available cloning systems. To overcome such limitations is necessary not only to support faster construction and analysis of multigene structures but also to open opportunities of studies not supported before by previous platforms.

Approach:

- Engineered sites for restriction enzymes allow efficient cloning cycle for exponential production of multigene constructs and genetic circuits.
- A triple-helix DNA based approach were implemented to overcome limitations imposed by restriction sites during gene cloning.
- 27 DNA fragments are joined at any given combination in just four cloning steps (5 days) using the TNT-cloning system, which is further enhanced by a unique buffer formulation.

Significance:

- For the first time, DNA parts are used from a individual library and automatically concatenates protein-encoding sequences in frame.
- No more use of sequence overlap/homology, linkers, adaptors or mutation of DNA fragments in order to clone.
- The custom design, engineering, and construction of genetic circuits is now extremely advanced, allowing for new endeavors in antibody, vaccines and drug production as well as rational control of organisms, from microbes to plants, as sources of food, feed, fiber, fuel and medicine.



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