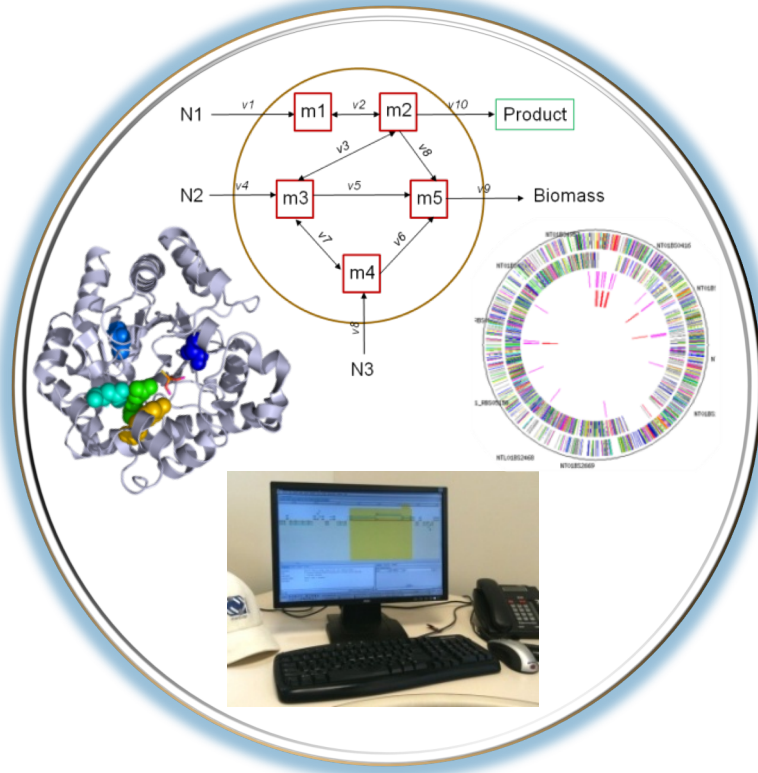


rapid product development from modular genetic blocks

**Kevin Jarrell**

CEO

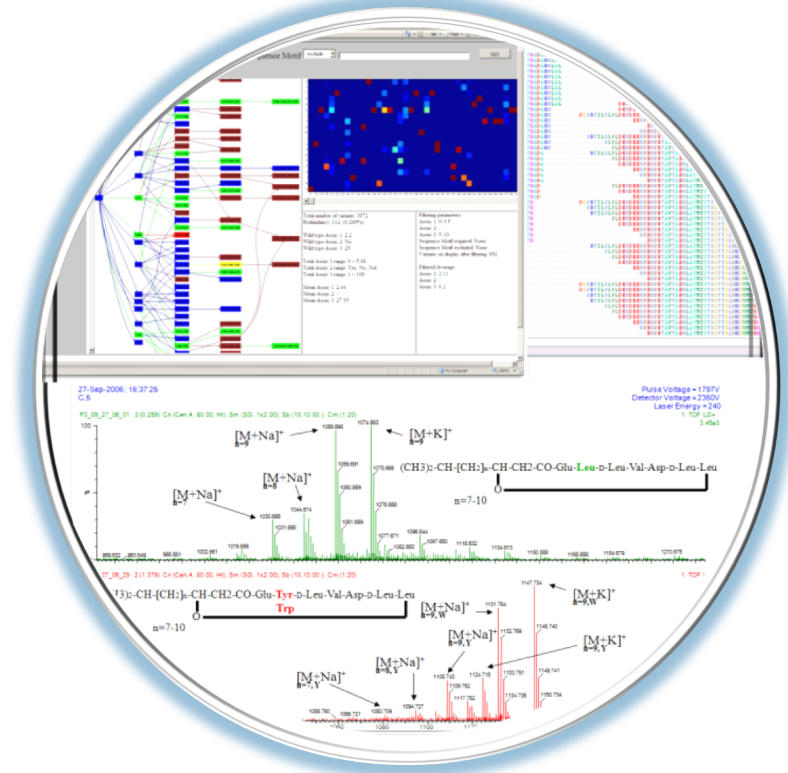
Can you make this?



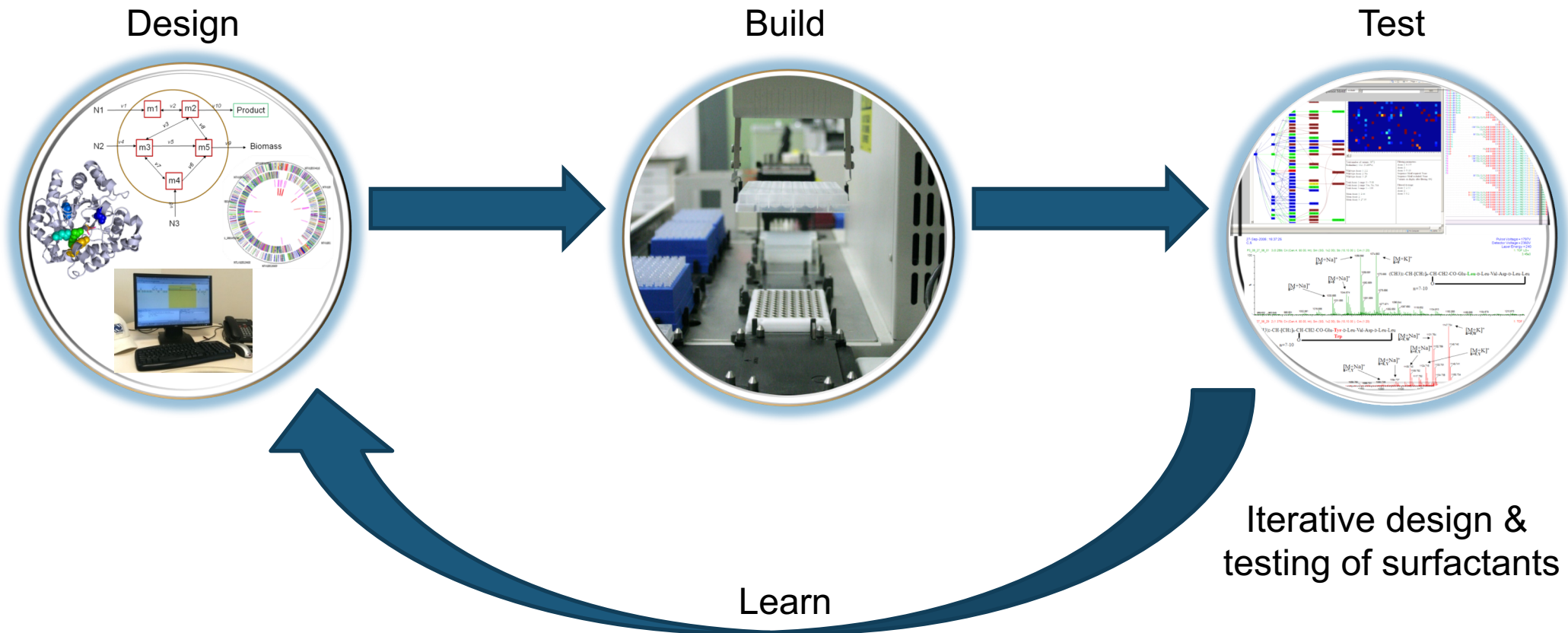
Can you make it economically?



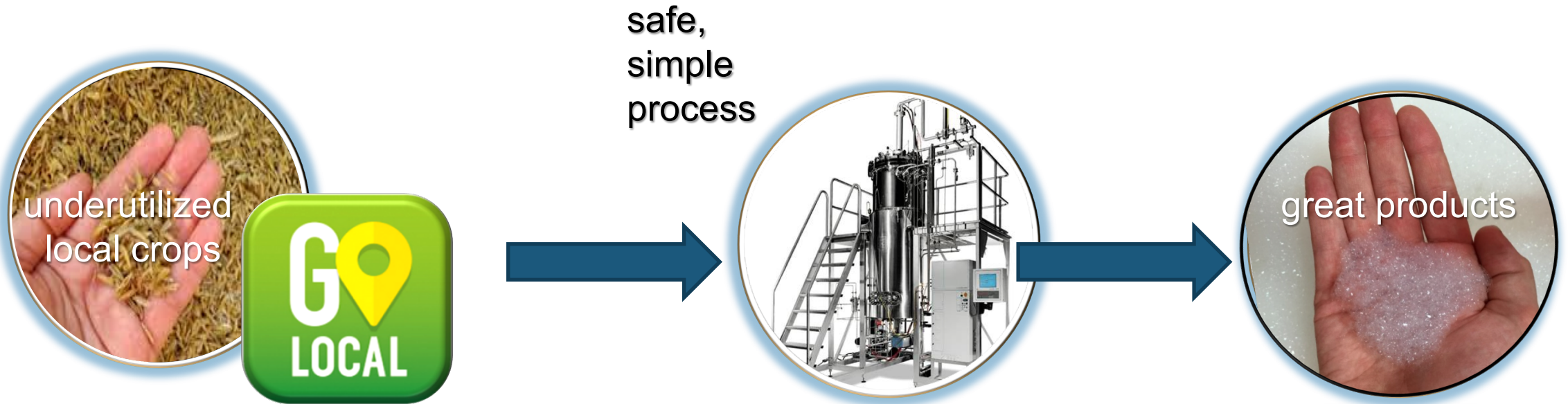
Can you make it from this feedstock?



# Classic process with a twist



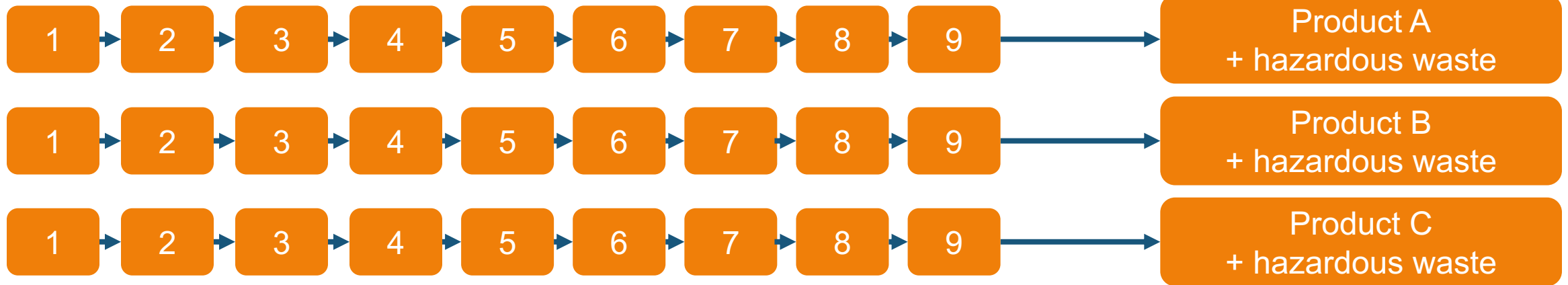
# Modular Genetics enables green manufacture of familiar products



# Our approach: Engineer the process for a suite of products



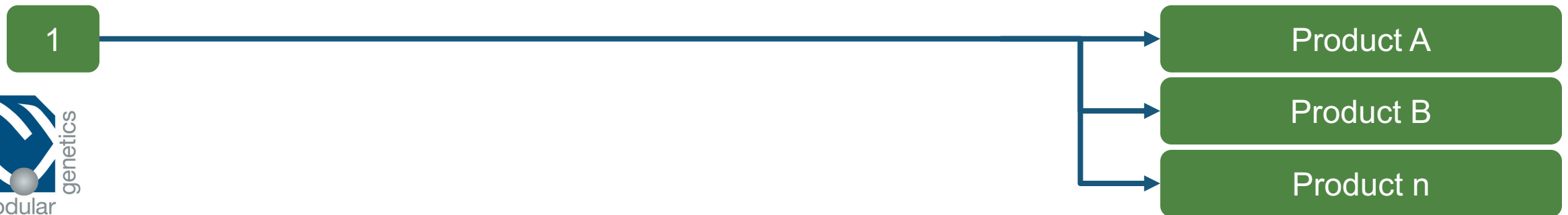
## Petroleum-based process



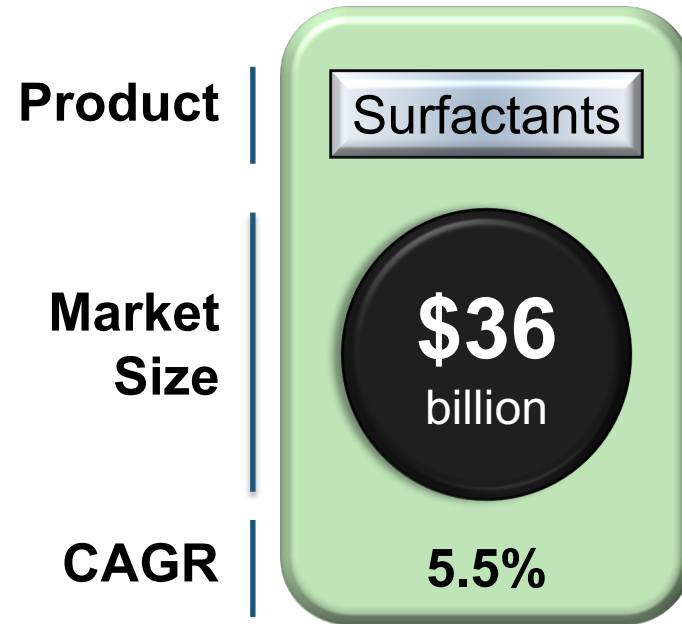
## Standard biosynthetic process



## Modular Genetics



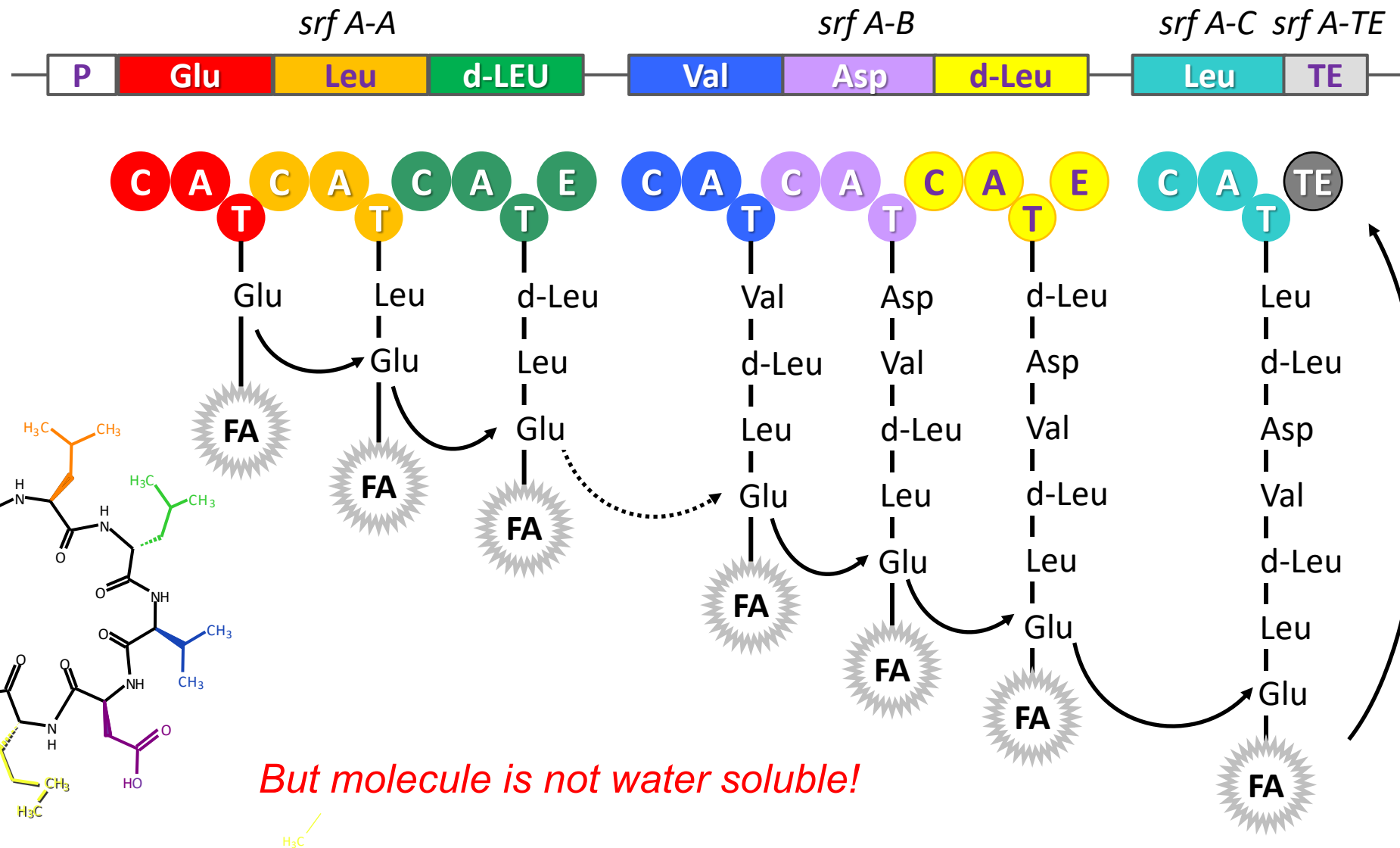
# Disruptive platforms addressing \$60B in markets



\* Market Ready /  
PO Received

[Markets & Markets](#)

# Surfactin: Modular genetic engineering of surfactants



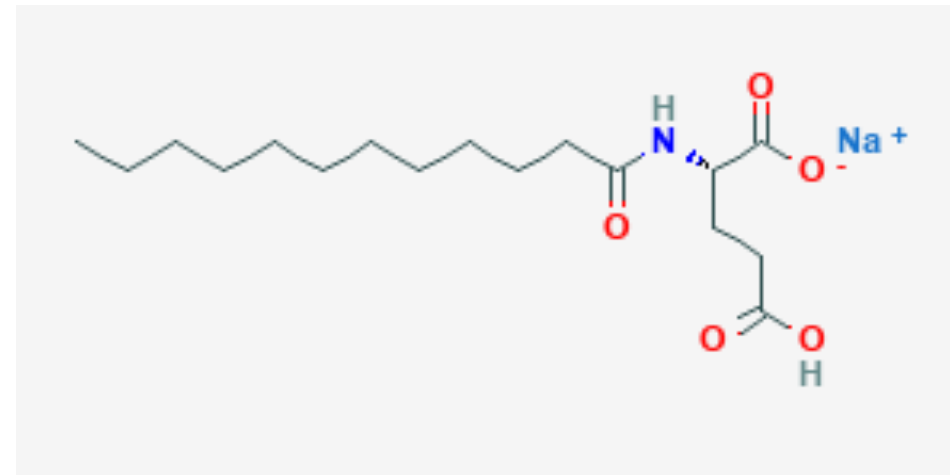
## Fatty acid + Glutamic acid



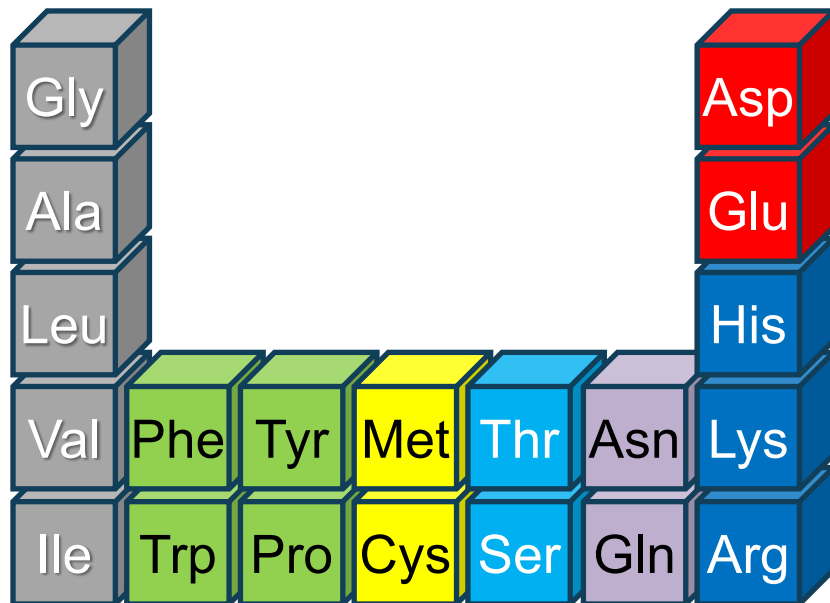
*site-specific deletion*



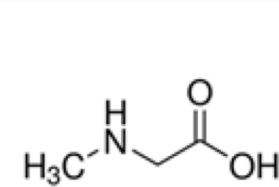
- Very water soluble
- Flexible and reactive
  - Acyl amino acid
  - Variable fatty acid chain (13 – 16 carbon length)
  - Two carboxylic acid functional groups on glutamic acid



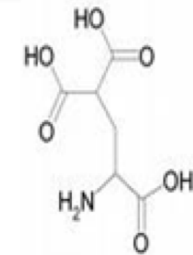
## 20 Standard Amino Acids



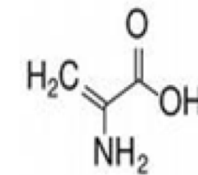
## 300+ Non-standard Amino Acids



Sarcosine



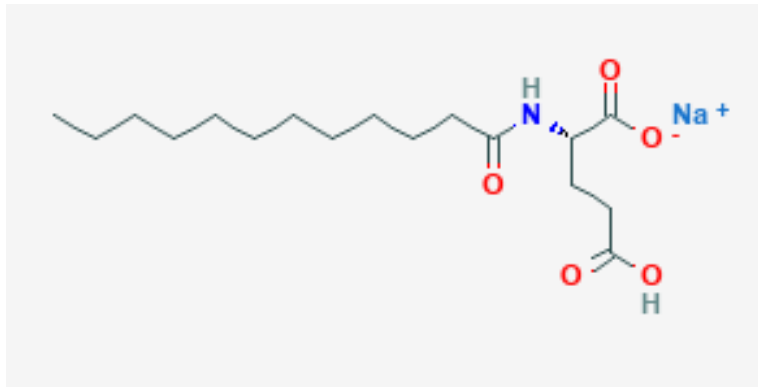
$\gamma$ -Carboxyglutamate



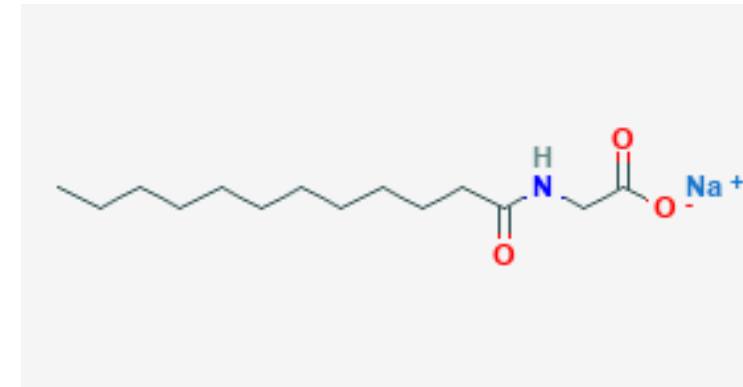
Dehydroalanine

# Modular's drop-in replacements for current surfactants

Fatty acid + glutamic acid



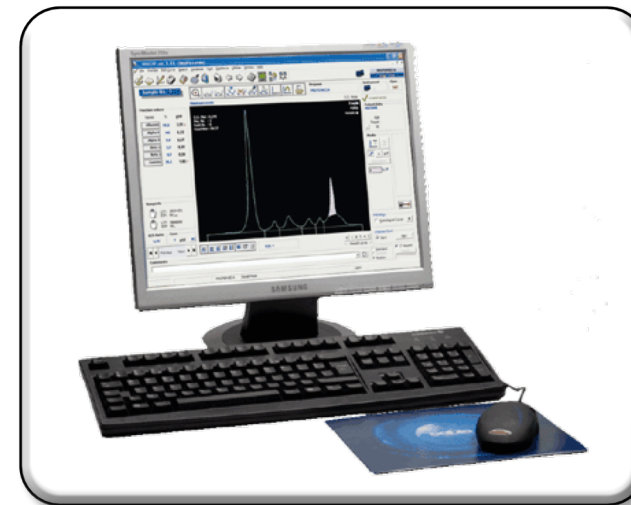
Fatty acid + glycine



- 5 Distinct US Patents
  - Generation of Acyl amino acids (7,981,685, 2011)
  - Nucleic Acid Cloning (7,579,146, 2009 and 7,439,021, 2008)
  - Ladder assembly for generating diversity (7,485,423, 2009)
  - Modular vector systems (7,435,562, 2008)
  - Ordered gene assembly (6,358,712, 2002)
- 31 additional patents or applications
  - 1 issued related U.S. patent
  - 4 issued foreign patents
  - 26 pending applications
- Technology and bio-engineering platform
  - Core bio-informatics
  - Metabolic engineering technology
- Issued, pending and continued applications
  - Engineered genes
  - Engineered micro-organisms
  - Renewable products
- Novel specialty chemicals
  - Composition of matter patent for the First “Green” Surfactant



- M.O.D.E.S.T.:
  - Modular's
  - Oligo
  - Design and
  - Engineering
  - Suite of
  - Tools
- Proprietary code
  - Programmer always on staff
  - > 300,000 lines of computer code
  - Statistical-based prioritization of experiments
- Manages and simplifies all steps
  - Gene, protein and metabolic pathway design
  - Sample tracking
  - Data tracking
  - Computer-assisted & fully-automated data analysis
  - Automated creation of robotic worklists



## Sustainability validation

“... a significant advance towards our **sustainability goals**”



## Performance validation




“... a level of performance, and a level of purity,  
**consistent with their use in commercial formulations**”

“**Modular Genetics**... platform could... up-end our industry (and that’s not my hype, that’s **Unilever** talking...)”

- Surfactant Monthly Review

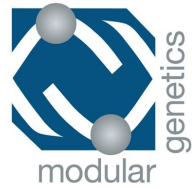
NEIL A BURNS

A black and white photograph of a man, likely a bodybuilder, in a dynamic pose, possibly performing a pull-up or a similar exercise. The lighting is dramatic, highlighting his muscles.

Surfactants Monthly Review – May 2016

By Neil A Burns | June 5, 2016 | Monthly Reviews | No Comments





- Dr. Kevin Jarrell – CEO
- Dr. Temple Smith – CIO
- Terry Brennan – V.P. Finance
- Tim Dummer – V.P. Business Development



If you are making soaps, we want to talk with you!

