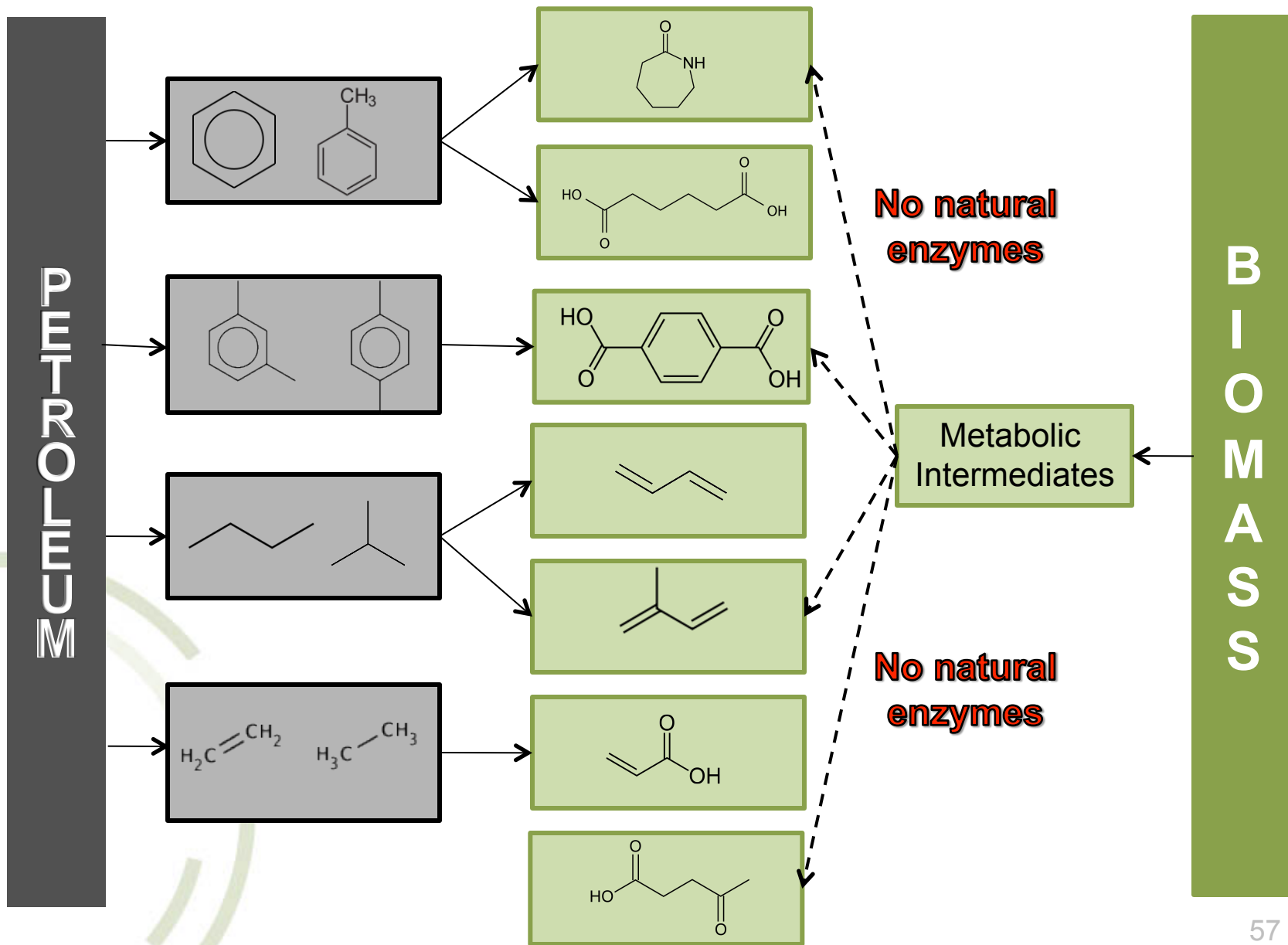




***Extending Nature's Reach:
New Enzymes for Bio and Specialty Chemicals***



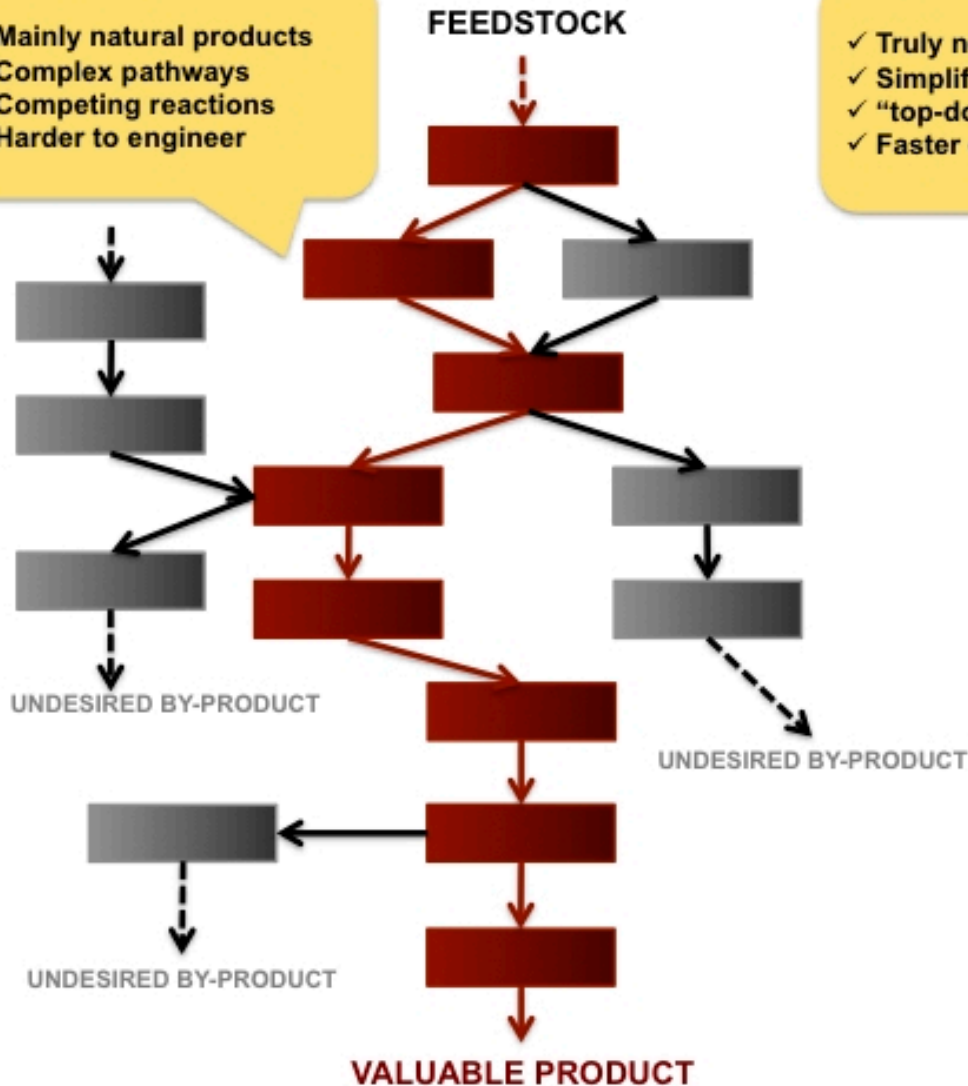
New Enzymes Enable New Bio-Based Chemicals



New Enzymes to Simplify Pathway Design

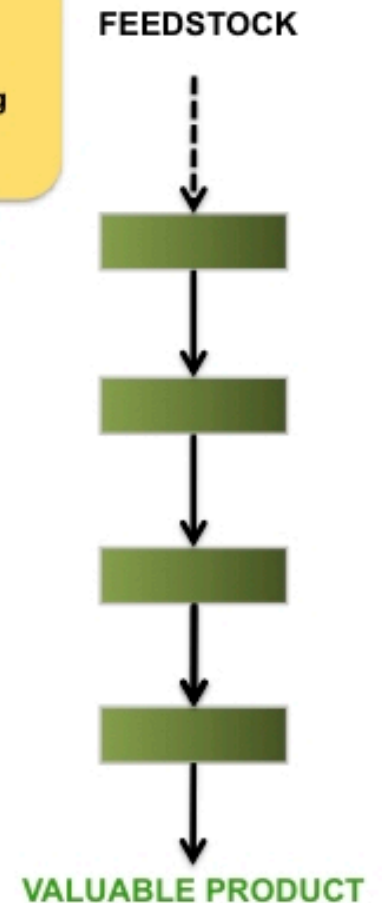
Optimizing Naturally Occurring Pathways

- ✓ Mainly natural products
- ✓ Complex pathways
- ✓ Competing reactions
- ✓ Harder to engineer



Engineering Pathways *De Novo* with Synthetic Enzymes Components

- ✓ Truly new products
- ✓ Simplifies pathways
- ✓ "top-down" engineering
- ✓ Faster engineering



Arzeda's Enzyme Design Tools Portfolio

Novel Enzymes Where Other Techniques Cannot Deliver

Level of Enablement for Novel Bioprocesses

<ul style="list-style-type: none">✓ Screen natural enzymes for activity✓ Optimize their activity		

Existing technologies

Problem: Existing Enzyme Science Limits Growth

Darwin In a Test Tube: harnessing Nature's diversity



Limitations:

- ❑ Requires natural enzyme
- ❑ Capital, Time, People intensive
- ❑ Limited diversity (10^{10})
- ❑ Can result in suboptimal solutions

Arzeda's Solution

Darwin in a Computer: Engineering New Diversity



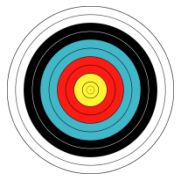
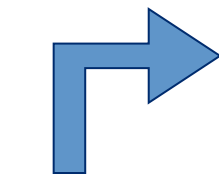
Limitations:

- ❑ Requires natural enzyme
- ❑ Capital, Time, People intensive
- ❑ Limited diversity (10^{10})
- ❑ Can result in suboptimal solutions

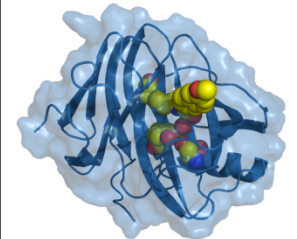
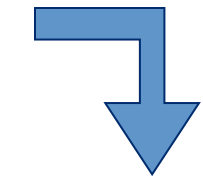
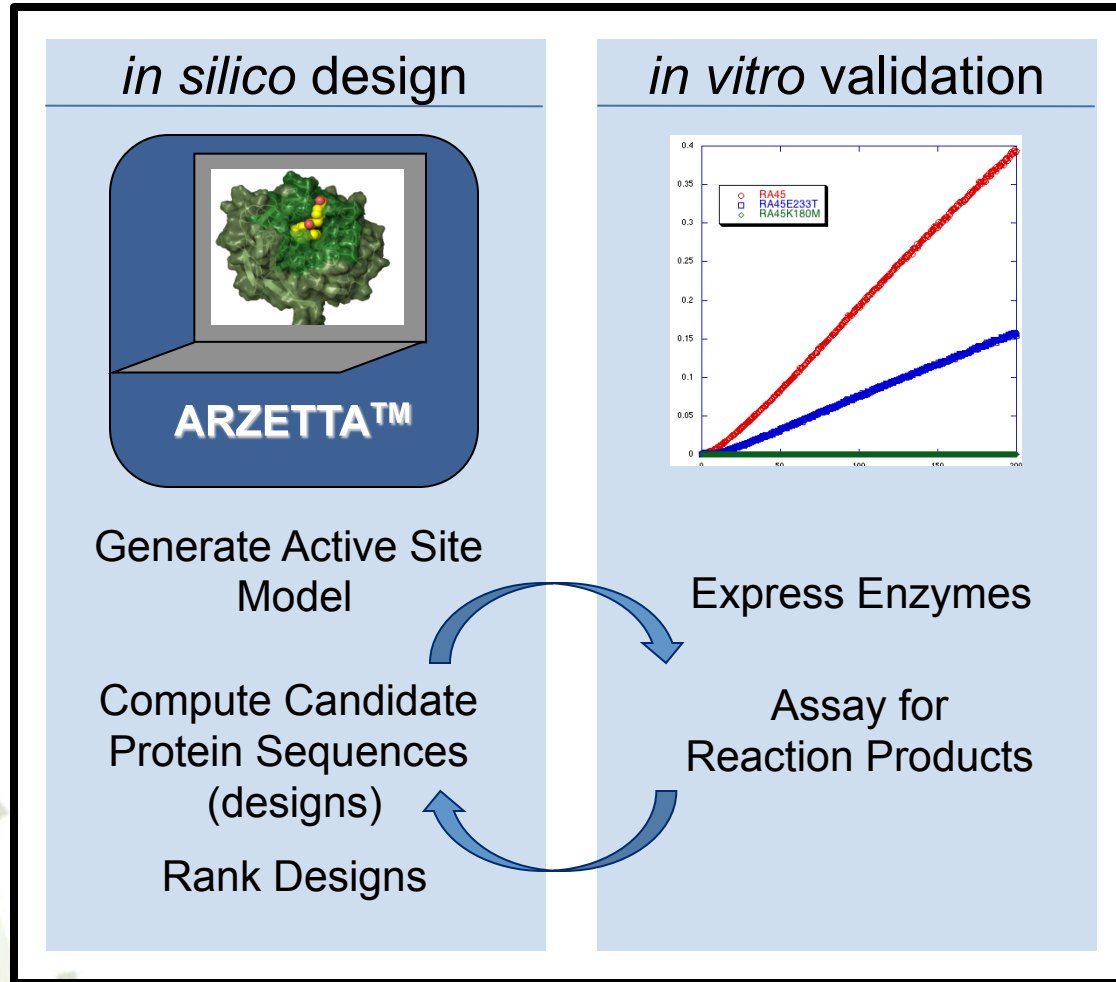


- ❑ A “paradigm” shift in enzyme engineering
- ❑ Engineer virtually unlimited diversity (10^{37})
- ❑ Only 100 best expressed & assayed in lab
- ❑ Trial & error shifted to low-cost, high-throughput environment

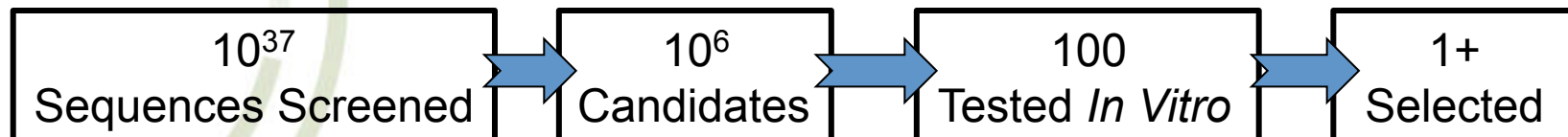
The Arzetta platform



Target
Reaction



Custom
Designed
Proprietary
Enzyme &
Product



Arzeda's Enzyme Design Tools Portfolio

Novel Enzymes Where Other Techniques Cannot Deliver

Level of Enablement for Novel Bioprocesses			<ul style="list-style-type: none"> ✓ Construct new Enzymes from scratch ✓ Optimize their activity
		<ul style="list-style-type: none"> ✓ Screen + design at the same time for novel activities. ✓ Optimize their activity 	
	<ul style="list-style-type: none"> ✓ Screen natural enzymes for activity ✓ Optimize their activity 		
	Existing technologies	Arzeda Identification	Arzeda De Novo design

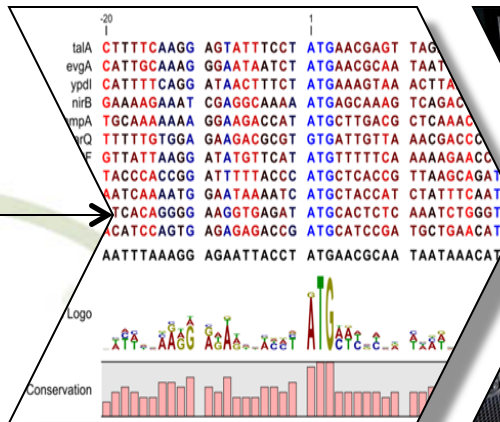
Arzeda's Integrated Enzyme Design Platform

Integrating Bioinformatics, Computational Design and Exp. Validation

- ✓ Integration of structural DB search
- ✓ Integration of homolog search

- ✓ Cloud computing platform
- ✓ Proprietary computational Design tool Arzetta

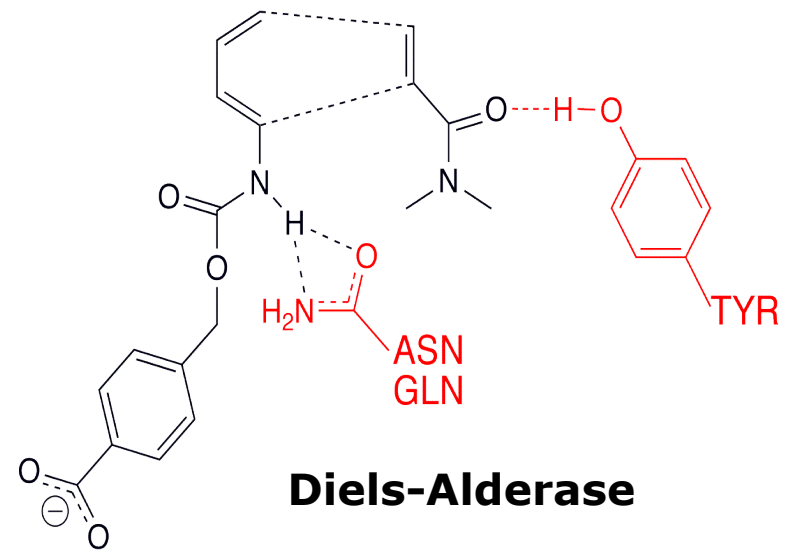
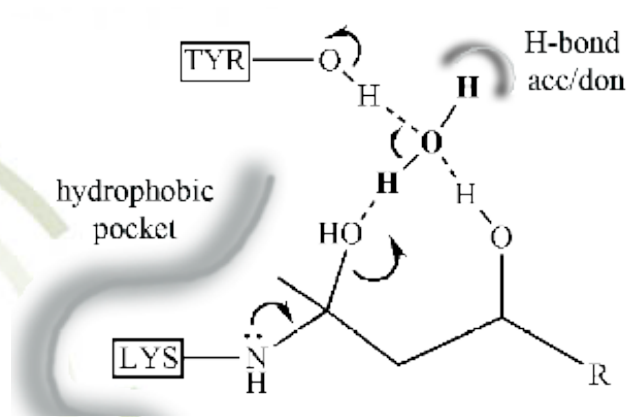
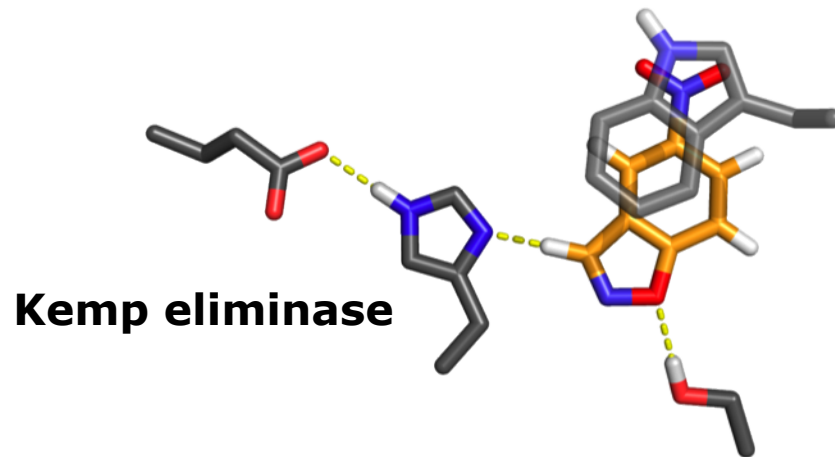
- ✓ Experimental lab set-up
- ✓ Assay development



Feedback loop

Novel Active Sites from Scratch

Designed for reactions unanticipated by nature



A Commercially Validated Technology



✓ *“A novel enzyme developed by Arzeda is showing activity toward a trait of interest for two core crops for Pioneer - corn and soybean. This is another tool in Pioneer's growing technology toolbox that is helping to extend its leadership position in gene discovery and bring new crop solutions forward. “*

Applications of Arzeda's Technology

De novo enzyme design

Loop remodelling for
specificity redesign

Screening of promising
template for redesign
(structural / metagenomic
libraries)

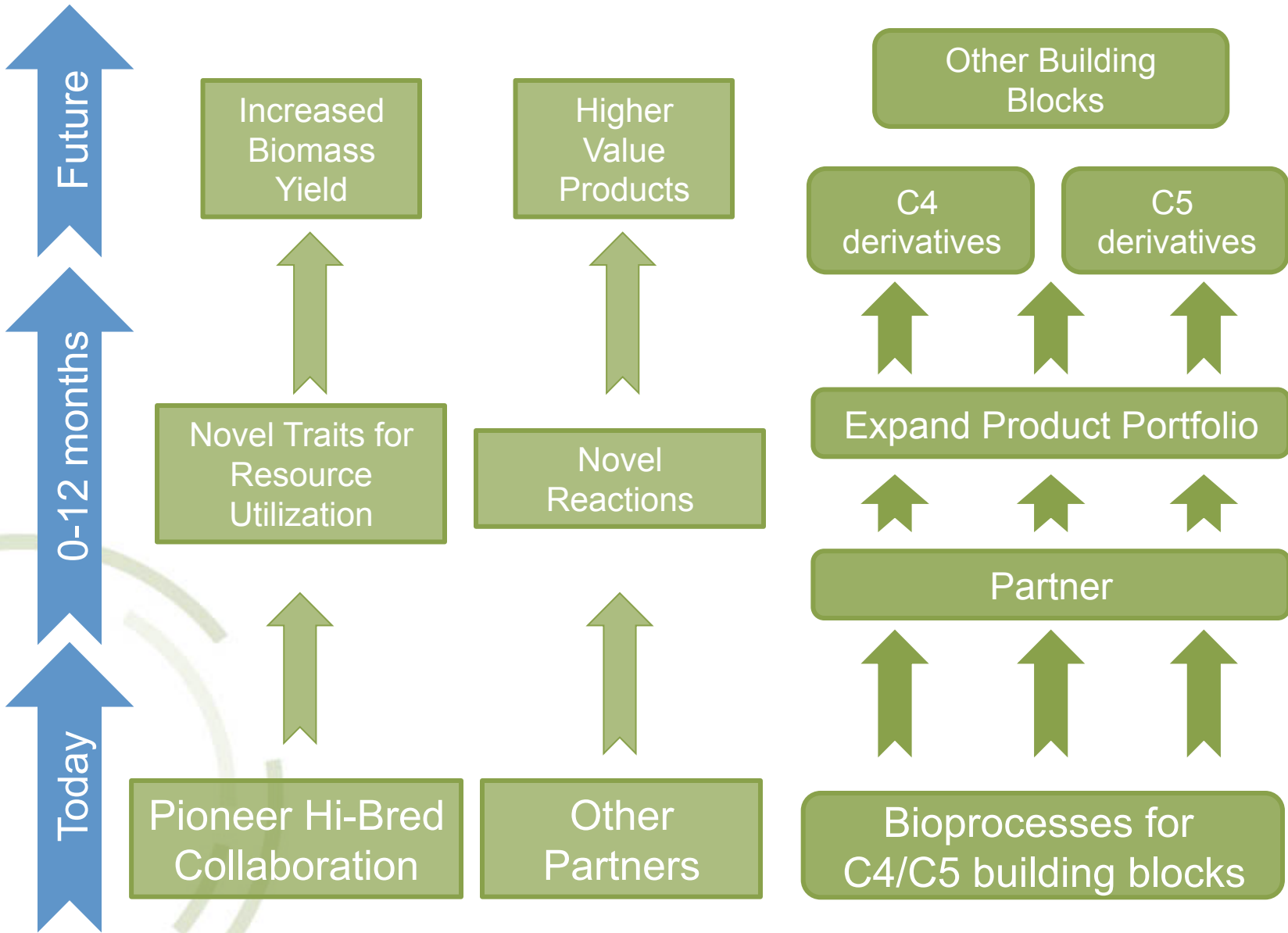
ARZETTA

Thermostabilization

Consensus design /
Computational shuffling /
Library optimization

Market Entry Strategy – Partnership-based Development

Focusing on AgBiotech and Bio-Based Chemicals



Contact

Arzeda Corp.

2722 Eastlake Ave. E. Suite 150

Seattle, WA 98105

www.arzeda.com

eric.althoff@arzeda.com