PMC123.1 - Budget Justification for SF 424A Budget

Instructions and Summary

Award Number: DE-FOA-0000096
Award Recipient: Solazyme

Date of Submission: 12/29/2009
Form submitted by: Solazyme
(May be award recipient or sub-recipient)

Please read the instructions on each page before starting.
If you have any questions, please ask your DOE contact. It will save you time!

On this form, provide detailed support for the estimated project costs identified on the SF-424A form (Budget).

- The dollar amounts on this page must match the amounts on the associated SF-424A.
- The award recipient and each sub-recipient with estimated costs of $100,000 or more must complete this form and a SF-424A form.
- The total budget presented on this form and on the SF424A must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed.
- For costs in each Object Class Category on the SF-424A, complete the corresponding worksheet on this form (tab at the bottom of the page).
- All costs incurred by the preparer's sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED
(Note: The values in this summary table are from entries made in each budget category sheet.)

CATEGORY	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Total Costs	Project Costs %	Comments (Add comments as needed)
a. Personnel						
b. Fringe Benefits						
c. Travel						
d. Equipment						
e. Supplies						
f. Contractual						
Sub-recipient						
FFRDC						
Vendor						
Total Contractual						
g. Construction						
h. Other Direct Costs						
i. Indirect Charges						
Total Project Costs	$					

REDACTED
EXEMPTION 4

Additional Explanations/Comments (as necessary)

a. Personnel

PLEASE READ!!!

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under f., Contractual. This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.).

Add rows as needed. Formulas/calculations will need to be entered by the preparer of this form. Please enter formulas as shown in the example.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			

REDACTED
EXEMPTION 4

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
	Total Personnel Costs												

REDACTED
EXEMPTION 4

Additional Explanations/Comments (as necessary)

a. Personnel

b. Fringe Benefits

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:		REDACTED		
Total fringe requested:		EXEMPTION 4		

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information, if it has not already been provided to the Contracting Officer, OR if it has changed since it was. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

____ **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

X **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional explanation/comments (as necessary)

c. Travel

PLEASE READ!!!

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs are items such as past trips, current quotations, Federal Travel Regulations, etc.

All listed travel must be necessary for performance of the Statement of Projecct Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
EXAMPLE ONLY!!! Visit to PV cell mfr. to set up vendor agreement							
Domestic Travel subtotal							
International Travel							
International Travel subtotal							
Budget Period 1 Total							

REDACTED EXEMPTION 4

REDACTED EXEMPTION 4

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 2							
Domestic Travel							
REDACTED EXEMPTION 4							
Domestic Travel subtotal							
International Travel							
		REDACTED EXEMPTION 4					
International Travel subtotal							
Budget Period 2 Total							
Budget Period 3							
Domestic Travel							
Management of cellulosic feedstock							
Domestic Travel subtotal							
International Travel		REDACTED EXEMPTION 4					

c. Travel

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
			REDACTED				
International Travel subtotal			EXEMPTION 4				
Budget Period 3 Total							
PROJECT TOTAL							

Additional Explanations/Comments (as necessary)

d. Equipment

PLEASE READ!!!

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs .

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber					
				REDACTED EXEMPTION 4	
Budget Period 1 Total					
Budget Period 2					
				REDACTED EXEMPTION 4	
Budget Period 3					

Equipment Item	Qty	Unit Cost	Total Cos	Basis of Cost	Justification of need
				REDACTED EXEMPTION 4	
Budget Period 3 Total					
PROJECT TOTAL					

Additional Explanations/Comments (as necessary)

REDACTED
EXEMPTION 4

e. Supplies

PLEASE READ!!!

Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs.

List all proposed supplies below, providing a bases of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
			Budg	**Period 1**	
EXAMPLE ONLY!!! Wireless DAS components					
				REDACTED EXEMPTION 4	
Budget Period 1 Total					
			Budget Period 2		
				REDACTED EXEMPTION 4	
			Budget Period 3		
			$0		

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
				REDACTED	
				EXEMPTION 4	
Budget Period 3 Total					
PROJECT TOTAL					

Additional Explanations/Comments (as necessary)

f. Contractual

PLEASE READ!!!

The entity completing this form must provide all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners in the applicable boxes below.

Sub-recipients (partners, sub-awardees):
For each sub-recipient with total project costs of $100,000 or more, a separate SF-424A budget and PMC123.1 budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipeint entries below.

The preparer of this form need only provide further support of the completed sub-recipient budget forms as they deem necessary. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):
List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):
For FFRDC partners, award recipient will provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification. The award recipient may allow the FFRDC to provide this information directly to DOE.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.					
	REDACTED EXEMPTION 4				

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
	Sub-total	$476,740	$13,217,298	$0	$13,694,039

Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1	Budget Period 2	Budget Period 3	Project Total
EXAMPLE ONLY!!! ABC Corp.	REDACTED EXEMPTION 4				

FFRDC Name/Organization	Purpose	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
	REDACTED EXEMPTION 4				
Total Contractual					

AdditionalExplanations/Comments (as necessary)

REDACTED
EXEMPTION 4

g. Construction

PLEASE READ!!!

Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under f. Contractual.

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Overall description of construction actiivities:

Example Only!!! - Build wind turbine platform

General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!			
		REDACTED EXEMPTION 4	
Budget Period 1 Total			
Budget Period 2			
		REDACTED EXEMPTION 4	
Budget Period 2 Total			

General Description	Cost	Basis of Cost	Justification of need
Budget Period 3			
		REDACTED	
		EXEMPTION 4	
Budget Period 3 Total			
PROJECT TOTAL			

Additional Explanations/Comments (as necessary)

h. Other Direct Costs

PLEASE READ!!!

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Examples are meeting costs, postage, couriers or express mail, telephone/fax costs, printing costs, etc.

Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General description	Cost	Basis of Cost	Justification of need
Budget Period 1			
EXAMPLE ONLY!!! Grad student tuition	$		
Budget Period 1 Total			
Budget Period 2			
Budget Period 2 Total			
Budget Period 3			
Budget Period 3 Total			
PROJECT TOTAL			

REDACTED
EXEMPTION 4

REDACTED
EXEMPTION 4

REDACTED
EXEMPTION 4

Additional Explanations/Comments (as necessary)

i. Indirect Costs

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:		REDACTED EXEMPTION 4		
Total indirect costs requested:				

A federally approved indirect rate agreement, or rate proposed supported and agreed upon by DOE for estimating purposes is required if reimbursement of fringe benfits is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed. Calculate the indirect rate dollars and enter the total in the Section B., line 6.j. (Indirect Charges) of form SF 424A.

____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

X **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional Explanations/Comments (as necessary) REDACTED EXEMPTION 4

Cost Share

PLEASE READ!!!

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided in the table below. Identify the source & amount of each item of cost share proposed by the award recipient and each sub-recipient or vendor. Letters of committment must be submitted for all third party cost share (other than award recipient).

Note that "cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies; and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds. Documentation of cost sharing commitments must be provided, if not already provided with the original application and they have not changed since its submission.

Fee or profit will not be paid to the award recipients or subrecipients of financial assistance awards. Additionally, foregone fee or profit by the applicant shall not be considered cost sharing under any resulting award. Reimbursement of actual costs will only include those costs that are allowable and allocable to the project as determined in accordance with the applicable cost principles prescribed in 10 CFR 600.127, 10 CFR 600.222 or 10 CFR 600.317. Also see 10 CFR 600.318 relative to profit or fee.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
ABC Company **EXAMPLE ONLY!!!**	Cash	Project partner ABC Company will provide 40 PV modules for product development at 50% off the of the retail price of $680	$13,600			**$13,600**
		REDACTED EXEMPTION 4				

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
		REDACTED EXEMPTION 4				
		Totals				

Total Project Cost:

Cost Share Percent of Award:

Additional Explanations/Comments (as necessary)

Solazyme's indirect rate is calculated based on the PMC 400.2 Sample Indirect Rate Proposal – Two Rate Method (Fringe and Indirect Rate).

Fringe rate justification:

____ **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

__X__ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

REDACTED
EXEMPTION 4

Indirect rate justification:

____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

__X__ **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

REDACTED
EXEMPTION 4

REDACTED

FOIA EXEMPTION 4

____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

__X__ **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

DAVID F. BRINKMANN
561 Eccles Avenue
South San Francisco, CA 94040
650-780-4777
dbrinkman@solazyme.com

PRINCIPAL INVESTIGATOR

Chemical Engineer with over 33 years experience in process development, operations management, and technical leadership, mostly in the bio-process industry. Mr. Brinkmann has successfully developed and scaled up fermentation and downstream processes for a wide variety of bio-based products and organisms. He demonstrates extensive experience at design and management of bio-process facilities, as well as coordination of CROs & CMOs. Strengths include techno-economic modeling and strong communication skills.

PROFESSIONAL EXPERIENCE

Solazyme Inc – South San Francisco CA
Vice President Manufacturing (Mar'09 – present)
Senior Director Process Development & Manufacturing (Jul'07 – Feb'09)
• Responsible for Fermentation and Downstream Process Development teams, including in-house activities as well as scale up and toll manufacturing of Solazyme products at CROs & CMOs.
• Built a very strong Process Development Team. Designed and implemented highly functional fermentation and downstream process development lab facilities.
• Developed detailed techno-economic models for algal oil manufacturing. Contracted with a capital engineering firm for development of detailed mfg plant design and capital cost.
• Achieved very significant (many fold) improvements in fermentation productivity and mfg cost for algal oils, mainly via fermentation process optimization.
• Developed a functional process for extraction and conversion of algal oil.
• Transferred process technology and produced large quantities of algal oil at multiple CMOs.
• Coordinated closely with Solazyme Research, Bus Dev and Product Dev teams.
• Functioned as part of Solazyme senior management team. Presented to venture capitalists and potential strategic partners.

CP Kelco – San Diego CA
Director Biospecialties Operations (Apr'04 – Jul'07)
Manager Biotechnology Pilot Plant Operations (Jul'97 – Apr'04)
• Responsible for $7M operating budget and all operational aspects of a large Biotechnology Pilot Plant & Semiworks (up to 75 m3 fermentation scale) located at a xanthan gum mfg plant site.
• Member of Kelco's Site Management Team.
• Co-founded Kelco's Biospecialties Group (KBG). Collaborated closely on a) KBG strategic planning, and b) scouting and identification of potential KBG business venture partners.
• Served as primary contact for technical inquiries regarding KBG capabilities and services.
• Provided operational, technical, and mfg economics input for evaluation and negotiation of KBG deal structures and contracts.
• Directed on-site technical evaluation and implementation of KBG opportunities, including technology transfer and equipment modifications within BPP & Semiworks.
• Interfaced with Process R&D and Mfg Support teams to provide techno-economic modeling and to prioritize BPP fermentation & downstream process activities in support of Kelco biogums programs such as productivity improvement, cost reduction, introduction of new/differentiated biogums, etc.

• Directed and prioritized Semiworks production of a) new Kelco biogums for market evaluation, and b) toll mfg contracts for KBG products.
• Responsible for providing monthly KBG sales and mfg forecasts. Functioned as primary interface with KBG customers regarding technical performance, contract orders, shipments, invoices, etc.
• KBG opportunities spanned a very wide range, including fermentation and downstream processing for: algal oils (HUFAs & others), biodegradable plastics, enzymes, pharma intermediates, vitamins, antiviral proteins, carotenoids, flavors & fragrances, biopesticides, etal. Organisms included: bacteria, yeast, algae, and fungi.

A.E. Staley Manufacturing Co (Tate & Lyle) – Decatur IL
Manager Bioengineering Development (Oct'94 – Jul'97)
• Designed, implemented, and directed a biotechnology development lab / pilot plant located on-site at a large corn wet milling facility.
• Directed process development activities for lactic acid (bacterial) and citric acid (fungal).
• Provided operational, technical and mfg economics expertise in evaluation of potential new biochemicals ventures.

Weyerhaeuser – Federal Way WA
Sr. Bioengineering Specialist (Jan'88 – Oct'94)
• Responsible for process development and commercialization of bacterial cellulose ("Cellulon").
• Scaled up the Cellulon process (fermentation and downstream) from lab scale to commercial scale.
• Directed pilot scale fermentation development program at contract research facility.
• Designed, implemented and directed industrial scale (185 m3) production at toll manufacturing facility, to provide Cellulon in quantities suitable for market development.
• Provided detailed process technology transfer to potential Cellulon business venture partners / buyers.

Stauffer Chemical Co – Rochester MN
Technical Superintendent (May'84 – Dec'87)
• Designed, implemented, and directed on-site fermentation support lab at a whey-based fermentation and spray drying plant.
• Directed process development activities for anaerobic bacterial organic acid fermentation process.
• Scaled up aerobic bacterial polysaccharide process from lab scale to commercial scale.
• Implemented and directed industrial scale (175 m3) production at toll manufacturing facility, to provide product in quantity for market development.

Stauffer Chemical Co – San Jose CA
Manager Fermentation Operations (Nov'82 – May'84)
Fermentation Superintendent (Oct'81 – Nov'82)
Sr. Process Engineer (Jun'80 – Oct'81)

Diamond Shamrock Corp –Fairport Harbor OH and Redwood City CA
Process Engineering Supervisor, Redwood City CA (Aug'79 – Jun'80)
Process Engineer, Redwood City CA (Jul'77-Aug'79)
R&D Engineer, Fairport Harbor OH (Jun'75 – Jul'77)

EDUCATION
Case Western Reserve University, Cleveland, OH
BS Chemical Engineering *magna cum laude* **(Jun'75)**

JURGEN DOMINIK
Senior Vice President of Process Development and Manufacturing
Solazyme, Inc.
561 Eccles Avenue
S. San Francisco, CA 94080
650 780 4777

HIGHLIGHTS

Mr. Dominik's area of responsibility ultimately spanned operations in North America, South America, Europe, and Asia. His duties have included the management of design, construction, startup, and operation of several large-scale bioproduction facilities and natural product extraction manufacturing plants. Most recently he was responsible for the design and construction of two major expansions to the CP Kelco facilities in San Diego and Oklahoma, the design and construction of two pectin facilities in Denmark and Brazil, and provided design and engineering support for two biomanufacturing facilities in Danville, PA for Merck & Co. These projects all ranged from $40 million to over $100 million in size.

SYNERGISTIC ACTIVITIES

Throughout his career, Mr. Dominik has excelled at guiding new basic technologies in the field of bioproduction from the laboratory, through scale up, and into commercial processes. For example, he has developed multiple advanced bioprocesses and managed their commercialization, including processes to:

- Extract hydrocolloids (alginates) from macro alga (kelp).
- Produce xanthan biogum exploiting new mixing technology (which he developed and implemented) that more than doubled productivity and gave CP Kelco a competitive advantage that persisted for decades.
- Exploit orange peel as a new source of high grade pectin. For over 60 years, the industry could utilize only lime and lemon. This technology was developed in 2002, introduced into manufacturing in 2003, and rapidly expanded to become CP Kelco's major raw material by 2004. It lowered costs by 30% and provided an enormous competitive advantage.
- Produce LMA pectins with exceptional gel strengths based on a novel enzyme-based alternative technology. He moved the technology from the lab into production in a new custom-built facility in just 18 months.

Mr. Dominik was responsible for the technical groups at CP Kelco that developed the algal bioprocess that Martek Biosciences now employs to manufacture omega-3 fatty acids (a high-value nutraceutical oil). In two years, his groups scaled this process up from the laboratory to 150,000 liter vessels while also improving the product content and titer from low values to over 70% and 180 g dry cell weight / liter, respectively.

PROFESSIONAL EXPERIENCE

Solazyme, Inc.

- Senior Vice President of Process Development and Manufacturing **Oct 2007-Present**

CP Kelco **2004-2007**

- Consultant to Huber, new owners of CPK
- Located and managed the acquisition of a Chinese xanthan gum producer.

CP Kelco **2000-2004**

- Senior Vice President of Global Operations

Responsibilities included manufacturing, logistics, capital spending and bioprocess research and development.

Nutrasweet Kelco **1994**

Instrumental in developing high-volume, low-cost bioproducts produced by microorganisms, including algae, and turning them into global businesses.

- Vice President of Operations (This included all algin, aspartame, and biogum manufacturing world wide, as well as supply chain, capital engineering, and Pilot Operations.)
- Senior Vice President, added the responsibility for alginate and biogum research

Kelco Company, A Division of Merck & Co. **1973**

- Director of Process and Product Development
- Director of Biogum Operations
- Director of International Manufacturing
- Managing Director of the International Division
- Vice President of World Wide Operations

Kelco Company **1970**

- Research engineer when xanthan gum was an embryonic new product.

EDUCATION

Stanford University, Masters of Business Administration **1994**
Ohio University, Bachelor of Science, Chemical Engineering **1967**
Ohio University, Bachelor of Science, Chemistry **1967**

Stephen Decker

Solazyme, Inc., 561 Eccles Avenue, S. San Francisco, CA 94080; sdecker@solazyme.com

Education & Training:

Moravian College	1990 – 1994	B.S. in Biology

Graduate Studies:

University College, London	1998	10 MsC credits in Bioprocess Engineering
University of Georgia	1999	12 C.E. credits in Microbial Physiology

Professional Experience:

Solazyme, South San Francisco, CA
Process Development and Manufacturing
Senior Manager – Fermentation Process Development — July 2008 to present

Vaxgen, South San Francisco, CA
Manufacturing Operations
Associate Director – Bulk Mfg Operations — September 2006 to April 2008
Senior Manager – Manufacturing Sciences — April 2005 to September 2006

Amgen, Thousand Oaks, CA
Cellular Process Development
Senior Associate Scientist — August 2003 to April 2005

Merck Research Laboratories, West Point, PA
Bioprocess Research and Development - Department of Fermentation and Cell Culture
Research Microbiologist — June 2000 to August 2003
Staff Microbiologist — September 1997 to June 2000
Microbiologist — September 1996 to September 1997
Contract Microbiologist — January 1995 to September 1996

Moravian College, Bethlehem, PA
Biology Department
Laboratory Assistant — September 1992 to May 1994

Industrial Experience:

- Development and technology transfer of four manufacturing scale, GMP fermentation processes for the production of recombinant proteins (HPV Virus Like Particles) to support Phase I, II and III clinical trials and facility licensure (Gardisil®).

- Management and technical oversight of upstream and downstream operations in manufacturing facility
  - Oversight for capital and engineering projects
  - Identification of corrective actions and preventative actions for closure of process related deviations
  - Conduct technical investigations and troubleshoot process upsets

- Trending and analysis of manufacturing data including application of statistical process control
- Implementation of process improvements

- Technical lead for process development /manufacturing and manufacturing facility due diligence teams as part of merger and acquisition opportunities

- Conducted and supervised scientists conducting microbial fermentation (*S. cerevisiae, E. coli, P. pastoris,* numerous algal strains) and mammalian cell culture (CHO) strain selection, process development, process characterization and GMP manufacturing

- Conducted lab scale, pilot scale and manufacturing scale fermentations to develop high cell density fermentation processes for production of recombinant proteins and natural products using bacterial, fungal, algal and mammalian cultures.

Selected Presentations:

- Vandusen, W.J., Decker, S.M., Apana, C., Fu, J., Herber, W.K., George, H.A.1995. On-line, non-invasive monitoring of some common analytes in fermentation media of *Saccharomyces cerevisiae, Neisseria meningitidis,* and *Escherichia coli.* Recent Advances in Fermentation Technology Joint Meetings (SIM and BIOT/ ACS), San Diego, CA.

- Decker, S., Vandusen, W., Hurni, W., Neeper, M., Schultz, L., Herber, W. and George, H. 1996. Effect of zinc ion on the galactose-regulated expression of a human papillomavirus protein and on general galactose catabolism in a recombinant strain of *Saccharomyces cerevisiae.* 211th Annual Meeting, American Chemical Society, New Orleans, LA.

- Shultz, L.D., Markus, H., Hofmann, K.J., Neeper, M., Lowe, R., George, H., Decker, S., Lehman, D, Joyce, J., Cook, J., Brown, D.R., Ellis, R.W., Shaw, A.R., Jansen, K.U. 1996. Expression of human papillomavirus (HPV) capsid proteins and formation of HPV virus-like particles (VLPs) by *Saccharomyces cerevisiae.* Yeast Genetics and Molecular Biology Meeting. University of Wisconsin. Madison, WI.

- Gadam, S., Decker, S., and Henrickson, R. 2001. Unintended interactions between fermentation and downstream chromatography steps in the purification of virus-like particles. Industrial Case Studies in Bioprocess Integration. 221st Annual Meeting, American Chemical Society, San Diego, CA.

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QUALIFICATIONS SUMMARY:

Technical/Project Manager with 12 years of effective technical leadership coordinating multi-disciplined teams to achieve objectives in the value added food and biotech manufacturing sectors. Five years pilot to scale process development experience working with algae-to-nutraceuticals technology. Multi-million dollar project management experience directing engineering, equipment, and automation firms through design, construction, and commissioning/qualification phases. In addition, a record of creating dynamic and innovative control solutions applying DCS and PLC technology. Possess exceptional team building, people management skills with a strong emphasis on safety and quality.

Professional EXPERIENCE

10/2007 – 12/2008, PetroAlgae LLC, Melbourne, FL
Downstream Engineering Director,
(Petroalgae is a photosynthesis based algal biofuel company.)

- Directly responsible for attempting to develop an economically viable commercial process to convert algae into bio-fuel
  - Applied non-solvent based lipid extraction in addition to percolation and immersion techniques
  - Developed an extraction pathway for green and stressed algae yielding 95%
  - Defined pre-treatment pathways for extracted crude
- Created and implemented an analytical program to support commercial development
- Coordinated external consultants, equipment designers and engineering firms to define commercial pathways to bio-fuel

7/2003 - 10/2007, Martek Biosciences Co., Kingstree, SC.
9/2006 - 10/2007, Downstream Technical Manager,
(Martek Biosciences Corp. is a world leader in the development and commercialization of health nutritional products derived from micro algae and fungus. Martek developed and patented two fermentable strains of micro algae which produce oils rich in docosahexaenoic acid (DHA) and one fungus strain that produces an oil rich in arachidonic acid, ARA.)

- Planned, directed and controlled technical activities to accomplish budgeted financial and production objectives for $115 million in recovery/downstream assets. Responsible for providing technical and managerial support to 44 operators, 4 specialists, and four engineers. Provided technical expertise to multi-national production facilities both in the US and Europe.

- Produced $9.7 million in increased revenue from process optimization and variable cost reduction initiatives. Increased productivity 50% in ARA Extraction and doubled productivity in the DHA Extraction process. Reduced capital expenditure by $1million for RBD Crystallization Project by providing creative process solutions utilizing existing equipment.

07/2003- 09/2006, Project Manager (Martek)

- Led and coordinated contract engineering, construction and process development firms in design and construction in $99 million of capital expansion