

A MEMBER OF THE AJINOMOTO GROUP

February 5, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

Ajinomoto Althea, Inc., has all of its operations in San Diego and employs several hundred persons, most of whom are in positions of biopharma manufacturing operations, quality control, and all of the supporting functions around those services that we offer clients from all over the world. We represent a wonderful opportunity for a student to stay in the San Diego area after school and use their baccalaureate degree to its fullest. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program. Unlike a lot of small biotech companies, we have very few Ph.D.s and in fact rely heavily on the type of person the MiraCosta program is targeting. As President and CEO of Althea, I can tell you that finding top notch, qualified, trained talent is one of our biggest challenges and opportunities for improvement.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,



J. David Enloe Jr.
President and CEO



February 6, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As VP of Global Operations for Beckman Coulter, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Dean T. Anderson', written in a cursive style.

Dean T. Anderson



February 11, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

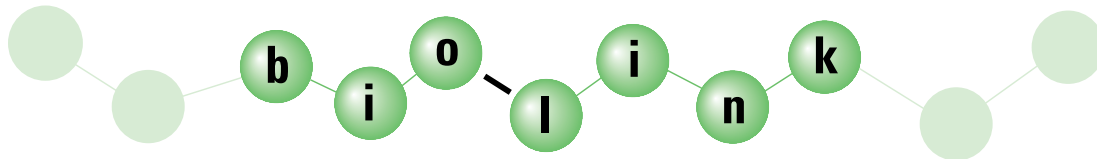
As Executive Director for the Biocom Institute, our mission is to facilitate a strong local life science workforce and I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Our affiliate organization, Biocom is a trade association with over 650 member companies, 70% of those are life science industry companies in our region. Through ongoing workforce development surveys of Biocom's member companies we know that an emphasis on quality is lacking in the existing degree programs in our region. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. To my knowledge there are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Liisa Bozinovic". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Liisa Bozinovic,
Executive Director



City College of San Francisco
Next Generation National Advanced Technological Education Center for Biotechnology and Life Sciences
1855 Folsom Street, Suite 643, San Francisco, CA 94103
www.bio-link.org

February 4, 2015

Dr. Sunita Cooke, President
MiraCosta College
1 Barnard Drive, #7
Oceanside, CA 92056

Dear Dr. Cooke,

It is with great pleasure that I write in support for your proposal for your pilot Biomanufacturing Baccalaureate Degree. As the Executive Director of Bio-Link, a National Advanced Technological Education (ATE) Center of Excellence for Biotechnology and Life Sciences funded since 1998 by the National Science Foundation (NSF), I have contact with many biotechnology programs at community and technical colleges across the United States including the program at MiraCosta College. It is clear that the MiraCosta Biomanufacturing Program, under the direction of Mike Fino, is a national model. With the growing trend for community colleges to offer baccalaureate degrees in the effort to increase access and to address issues of demand and cost, the biotechnology programs need a way to efficiently provide access to the baccalaureate degree without repeating course work that has been included in the two-year degree.

One of the main reasons for our support of the Biomanufacturing Baccalaureate Degree at MiraCosta College is in response to increased workforce needs. A recent California statewide Labor Market Study entitled "Supply and Demand Analysis: Life Sciences and Middle Skills Workforce in California" addressed the needs of the workforce and gaps that currently exist. The pilot Baccalaureate Biomanufacturing Degree would offer an alternative and cost-effective way for students from biotechnology programs at community colleges to earn a seamless baccalaureate.

We understand that community colleges are not taking over the role of four-year institutions. But they can contribute to the education of highly qualified individuals for technical and high-demand jobs.

If you have any questions, please feel free to contact me at (415) 487-2472 or ejohnson@biolink.ucsf.edu.

Sincerely,

Elaine Johnson, Ph.D.
Bio-Link PI and Executive Director



CREATING AND SCALING
GREAT COMPANIES

February 12, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

RE: SUPPORT for MiraCosta College to offer a baccalaureate degree in Biomanufacturing in San Diego County

Dear Dr. Cooke:

As a leading voice for tech start-up and emerging companies, CONNECT would like to voice our support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions. As a non-profit business innovation accelerator, we are actively engaged in ensuring that innovation and innovative companies remain a strong and growing part of the entire region's economy and that includes ensuring they have the talent needed to help them grow.

CONNECT is a premier innovation company accelerator in San Diego that creates and scales great companies in the technology and life sciences sectors. By creating an environment in which entrepreneurs and C-suite executives have access to the people, capital, and technology resources they need for success. Since 1985, CONNECT has assisted in the formation and development of over 3,000 companies and is recognized as one of the world's most successful regional innovation development programs, having been modeled in more than 50 regions around the world.

San Diego County is known for its skilled and talented workforce, which is what makes us one of the most innovative cities in the Nation. But we need to keep our workforce trained and ready for the jobs of the future. With community colleges, such as MiraCosta, offering highly technical 4 year degree programs at affordable rates we will ensure that San Diego's students of today will have easy access to degrees that will offer them the jobs of tomorrow.

CONNECT supports MiraCosta College's proposal for a biomanufacturing bachelor's degree program. If we may answer any questions, please contact Theresa Andrews at tandrews@connect.org or (858) 964-1337.

Sincerely,



Greg McKee
CEO
CONNECT



Mike Fino <mike.fino@gmail.com>

Baccalaureate pilot program

Matthew Escobar <mescobar@csusm.edu>
To: Mike Fino <mfino@miracosta.edu>
Cc: Katherine Kantardjieff <kkantard@csusm.edu>

Fri, Dec 12, 2014 at 11:33 AM

Hi Mike,

Sorry for the delay in my response- I've been buried by finals week grading until now.

Now that I have a better idea of the curriculum, I don't see any major overlap between your proposed degree in Biomanufacturing and CSUSM's degree in Biotechnology. Whereas the Biotech degree is quite broad, your biomanufacturing degree is highly focused on a very specific workforce/skillset. We do cover some of these concepts in our courses, but certainly not in the depth that you are proposing.

Although I don't see any major overlap currently, I do have some concerns about how the Biomanufacturing major could evolve over time, and how that process would be reviewed (if at all) for overlap with other degree programs in the CSU/UC. In the CSU, initial approval of a degree is a convoluted process that involves many layers of review, including review at the Statewide CSU Chancellor's office. However, after a degree is approved, program changes (such as adding new concentrations/tracks) is a fairly simple process that is only reviewed by on-campus entities. If MiraCosta utilizes a similar workflow, is there any review process that would regulate the development of new concentrations/tracks that do substantially overlap with our degree (or planned degree) options? For example, I could see how a biofuels concentration could evolve from your biomanufacturing major. However, we are currently in the process of developing more curriculum and faculty expertise in the biofuels area, and may develop a concentration/track focused on this area in the future. What are your thoughts about maintaining the distinct subject-level coverage of the Biomanufacturing degree compared to our Biotechnology degree (or other similar programs at CSUs, UCs) as your program grows and develops?

Thanks for checking in with me on this- I appreciate your clear communication throughout the process of developing your degree proposal.

Thanks,

Matt

Matthew Escobar, Ph.D.

Associate Professor

Department of Biological Sciences

California State University, San Marcos

333 S. Twin Oaks Valley Rd.

San Marcos, CA 92096

Phone: (760) 750-8083

Fax: (760) 750-3063

Email: mescobar@csusm.edu

From: Mike Fino [<mailto:mfino@miracosta.edu>]

Sent: Thursday, December 04, 2014 5:53 PM

[Quoted text hidden]

[Quoted text hidden]

Benard, Mary

From: Graham Oberem <oberem@csusm.edu>
Sent: Thursday, February 05, 2015 2:37 PM
To: Benard, Mary
Subject: Re: Biomanufacturing Degree at MiraCosts College

Good morning Mary,

Thank you for your email. I appreciate the update. I am aware that Mike Fino has continued the conversation with Matt Escobar about the specifics of the program you are proposing. I am sure that you are aware that the CSU is currently in the process of giving input, through our Chancellor's Office, to all fifteen of the proposal currently slated for approval in the Community College system. I would appreciate being kept in the loop with regard to your progress with the proposal and its implementation. We appreciate the collegial approach that you have taken with this project and look forward to future collaboration as both our institutions continue to serve the needs of our region.

Regards,

Graham

Graham Oberem, Ph.D.

Provost & Vice President for Academic Affairs
California State University San Marcos
oberem@csusm.edu
760-750-4054

From: <Benard>, Mary <mbenard@miracosta.edu>
Date: Thursday, February 5, 2015 10:25 AM
To: Graham Oberem <oberem@csusm.edu>
Subject: Biomanufacturing Degree at MiraCosts College

Good morning Graham,

Time has flown by and I wanted to update you on our progress in gaining approval to develop and offer a Baccalaureate degree in Biomanufacturing. Last month the Board of Governors gave preliminary approval of MiraCosta as one of the 15 pilot BA programs in the State of California to participate in the pilot by developing and offering a Baccalaureate degree in Biomanufacturing. Mike Fino, Department chair of biotechnology at MiraCosta, has been communicating with Matthew Escobar to ensure coordination and non-duplication of curriculum between MiraCosta and CSUSM. Additionally, we have begun to reach out to our industry partners to gain input and support as we develop new curriculum in the bio manufacturing area.

How would you like to be included in any conversations and updated on progress as we develop and prepare to implement this new program in the fall of 2017? I look forward to continuing the collaborative relationship with CSUSM as we develop this program. Please advise.

Regards

Mary
Mary K. Benard, Ed.D.
Vice President of Instruction



Oceanside Campus
1 Barnard Drive
Oceanside, CA 92056
(760) 795-6805

From: Graham Oberem [<mailto:oberem@csusm.edu>]
Sent: Tuesday, November 04, 2014 12:59 PM
To: Benard, Mary
Subject: Biomanufacturing and Media Arts

Dear Mary,

I was a pleasure talking with you and Mike earlier this week about your ideas for a 4-year degree in Biomanufacturing. It sounds as though that such a degree could co-exist with our Biotechnology program. We look forward to hearing more about your plans for the biomanufacturing degree in the next phase of the RFP.

You also mentioned interest in a possible degree in Media Arts. I have confirmed that our program for a degree in Art, Media, and Design, which has been about six years in planning and development, is now moving through our program review and approval process, with the hopes of starting in Fall 2015. This degree will include core courses in Digital Imaging, Digital Photography, Graphic Design, Web Design, Audio/Video Production, Digital and Media Arts, Video in the Community, Documentary Production, Generating Narrative, Computers & the Visual Arts, World Cinema, Video in the Community, Research to Production, as well as a series of foundational courses in art history, drawing, sculpting, etc. Without knowing more about what your proposers have in mind, we are concerned that a degree in "Media Arts" would overlap substantially with our degree in Art, Media, and Design.

I look forward to continuing our conversation with you about these two possible degree programs.

Regards,

Graham Oberem, Ph.D.
Provost & Vice President for Academic Affairs
California State University San Marcos
oberem@csusm.edu
760-750-4054



A Member of the Roche Group

February 4, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As Vice President and General Manager of Product Operations for Genentech in Oceanside, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,

Don Fitzgerald
VP and GM of Product Operations, Oceanside



genomatica
sustainable chemicals

February 9, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Bio-manufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As Executive Vice President of Process Technology for Genomatica, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and manufacturing of biotechnology in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion, this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions, please feel free to contact me.

Sincerely,

Jeff Lievens, Ph.D.
EVP, Process Technology
Office 858-210-4451
Email jlievence@genomatica.com

February 4, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree addresses an unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As Senior Plant Director, Biologics for Gilead Sciences, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. To my knowledge there are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,



James R. Kasselmann

Gilead Sciences, Oceanside CA

Sandra Slivka, PhD
Director & Sector Navigator

LIFE SCIENCES/BIOTECHNOLOGY INITIATIVE

10440 Black Mountain Road
San Diego, CA 92126
619-388-7490
sslivka@sdccd.edu



The Statewide Site for California's
Life Science Biotechnology Initiative
www.calbiotechcareers.org

January 26, 2015

Dr. Sunita Cooke
President
MiraCosta College

Dear Dr. Cooke,

As the Statewide Sector Navigator for Life Sciences/Biotechnology and on behalf of the California Life Sciences/Biotechnology Initiative, I am excited to offer this letter of support for your pilot Biomanufacturing Baccalaureate Degree.

The Economic and Workforce Development (EWD) is an integral part of the California Community Colleges which works under the Doing What Matters for Jobs and the Economy framework, investing funding and resources in Life Science and Biotechnology. EWD's industry-specific workforce services are statewide to align community college and other workforce development resources with the needs of industry sectors that result in highly specialized industry training, technical consulting and business development. Thus we serve the workforce needs of the biotechnology and biosciences communities in California in part by partnering with local and regional industry professionals to design skill-based instruction focused on employer needs.

The proposal from Mira Costa College to offer a Biomanufacturing Baccalaureate meets employer needs. These needs were defined recently in a statewide Labor Market Study "Supply and Demand Analysis: Life Sciences and Middle Skills Workforce in California" which can be found at Programs http://www.calbiotechcareers.org/wp-content/uploads/2014/11/LS-Biotech-Middle-Skills-Jobs-in-CA_Report_Oct-2014.pdf

This report identified a gap in the ability of Community Colleges and Four year institutions to provide the trained workforce needed for the CA Industry. The report identified that a skill and certification missing job seekers was training in "Quality Systems". Formal Quality Systems training is not currently addressed in a fashion that leads to 3rd Party Recognized certification (ASQ American Society for Quality www.asq.org) at either 2 or 4 year schools in California. Currently, some two year Community College biotechnology programs partially address these skills they currently cannot address this need since the ASQ certification requires a four year degree. Also, although this question was not addressed directly, interviews with human resources professionals (see study cited above) suggest the industry prefers "Quality Systems" training and hands-on skills training as well as individuals with a baccalaureate degree. No current program addresses these needs together. The proposal from Mira Costa addresses this gap. In my opinion this would be the first time the industry needs of this important Ca industry will be directly addressed.

Supporting my opinion, please find below our recent analysis of Biotechnology Degree Courses (p.46 of the study cited above) at CSUs and the courses proposed by Mira Costa for their pilot program. There is almost no commonality between the two charts. Of note is the fact that neither the Quality Classes nor the intensive hands on training in Bio-processing, Biomanufacturing etc. have any equivalent coursework in CSU programs available to prospective students.

In conclusion, I believe the Mira Costa proposal meets a unique workforce need that is not addressed at any four year college in California.

If you have any questions please feel free to contact me at the number/e-mail above.

Sincerely,

Simona Aloka Ph.D.

Appendix I – Biotechnology Programs of Study at California State University Locations

Source: Statewide Academic Senate C-ID Project

| Biotechnology Major Course | CSU Campuses | | | | |
|---|--------------------------------------|-------------------------------|--------------------------------------|---|------------------------------|
| | Channel Islands | Fullerton | Northridge | Pomona | San Marcos |
| Intro to Biotechnology | | | | 1 qtr unit | |
| Fresh/Soph Biology sequence: Cellular, Molecular, Evolutionary and Organismal w labs | 2 course sequence – 8 semester units | 4 courses – 20 semester units | 2 sets of courses – 8 semester units | 3 sets of courses – 15 quarter units | 2 courses – 8 semester units |
| Microbiology | | | | 4 qtr units | |
| General Chem w lab 1 | 4 sem units | 5 sem units | 4 sem units | 6 qtr units | 5 sem units |
| General Chem w lab 2 | 4 sem units | 5 sem units | 5 sem units | 6 qtr units | 3 sem units |
| Organic Chem w lab 1 | | 5 sem units | | | 5 sem units |
| Organic Chem w lab 2 | | 5 sem units | | | 5 sem units |
| Chem Quantitative Analysis | | | | 4 qtr units | x |
| Trig Based Physics w lab 1 | 4 sem units* | 4 sem units | 4 sem units | 8 qtr units – 1 st 2 courses | |
| Trig Based Physics w lab2 | 4 sem units* | 4 sem units | 4 sem units | 4 qtr units – 3 rd course | |
| Calc Based Physics w lab 1 | 4 sem units* | | | | 4 sem units |
| Calc Based Physics w lab 2 | 4 sem units* | | | | 4 sem units |
| Calculus for Life Science majors 1 | | Option** 4 sem units | | 4 qtr units | x |
| Calculus for Life Science Majors 2 | | | | | x |
| Engineering Calculus 1 | 4 sem units | Option** 4 sem units | | | 5 sem units |
| Engineering Calculus 2 | | Option** 4 sem units | | | |
| Statistics | | Option** 3 sem units | | | Bio stats 4 sem units |
| Biol Quantitative Methods/Biometrics | 3 sem units | | | 4 qtr units | |
| College Algebra or Trig or Pre Calculus | | X | 3 -5 sem units | | |
| Health, Nutrition & Integrated Being or Intro to Psy or Mind, Brain and Behavior or Soc | | | | 4 qtr units | 3 sem units |
| Financial Acct | | | | | 3 sem units |
| Managerial Acct | | | | | 3 sem units |

*students can choose trig or calc based physics

**student can choose between 'soft' or 'hard' calculus

Proposed Courses In Mira Costa College Baccalaureate Degree

| Biomanufacturing Science & Technology | Biomanufacturing Quality |
|---|--|
| <p>Process Sciences (Lec/Lab)</p> <ul style="list-style-type: none"> • Fundamental physical and chemical principles and technologies enabling large scale biomanufacturing • Thermodynamics and the properties of fluids; mass and heat transfer, fluid flow, and the energy relationships in fluid systems | <p>Statistical Process Control (Lec/Lab)</p> <ul style="list-style-type: none"> • Concepts and methodology for measuring and controlling quality during the manufacturing process; control charts, process capabilities |
| <p>Design of Experiments for Biomanufacturing (Lec/Lab)</p> <ul style="list-style-type: none"> • Formal methods in connecting process parameters and quality attributes towards improved process understanding • Full and fractional factorial experimentation | <p>Global Quality System Regulations (Lec)</p> <ul style="list-style-type: none"> • Study of the harmonized quality system approaches of ICH Q8, 9, 10, and 11, including quality risk management, qualification, and validation |
| <p>Design of Biomanufacturing Processes and Equipment (Lec/Lab)</p> <ul style="list-style-type: none"> • Advanced course work in the design of processes and equipment in biological production, recovery, and purification within a quality framework • Aseptic process design, fitness for use, critical utilities, modes of operation | <p>Six Sigma and Lean Manufacturing (Lec/Lab)</p> <ul style="list-style-type: none"> • Study of key six sigma concepts and tools; the DMAIC phases: design, measure, analyze, improve, and control • Use and implementation of lean tools to reduce waste |
| <p>Bioprocess Monitoring and Control (Lec/Lab)</p> <ul style="list-style-type: none"> • The measurement, monitoring, modeling, and control of biomanufacturing processes | <p>Methods in Quality Improvements and Investigations (Lec/Lab)</p> <ul style="list-style-type: none"> • The study of continuous quality improvement techniques, including investigational methods into process deviations |
| <p>Seminar in Biomanufacturing Technologies (Lec)</p> <ul style="list-style-type: none"> • Advances and current technology in biological production and purification operations | <p>Seminar in Biomanufacturing Quality (Lec)</p> <ul style="list-style-type: none"> • Advances and current practices in biomanufacturing quality |



The Northeast Biomanufacturing Center and Collaborative

An NSF Advanced Technological Education Center

Bryan Shingle
Advisory Board Chair
Janssen Research &
Development
Spring House, PA 19477

Alex Armendariz
Grifols Biologicals Inc.
Los Angeles, CA 90032

Stephen Dahms, Ph.D.
Southern California
Biomedical Council
Valencia, CA 92154

Eric Gennell
Genzyme Biosurgery
Cambridge, MA 02139

Deborah Grant
AbbVie
Worcester, MA 01605

Lee Landeen
Organogenesis Inc.
La Jolla, California
92037

David Lindsay, Ph.D.
AstraZeneca Operations
Frederick, MD 21703

Joseph Lingle
Sandoz Inc.
Princeton, NJ 08540

Ben Locwin, Ph.D.
Lonza
Biopharmaceuticals
Portsmouth, NH 03801

Katie Masterson
GlaxoSmithKline
Rockville, MD 20850

Michele Myers, Ph.D.
GlaxoSmithKline
King of Prussia, PA
19406

Russ Read, Ph.D.
Forsyth Tech
Community College
Winston-Salem, NC
27103

Ronald Sims, Ph.D.
Utah State University
Logan, UT 84322

Lisa Stillwell
Life Technologies, Inc

February 4, 2015
Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As Principal Investigator and Executive Director for the Northeast Biomanufacturing Center and Collaborative (NBC2) and with twenty-five years teaching biomanufacturing at all levels including industry, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

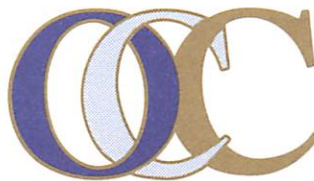
Sincerely,

Sonia Wallman, Ph.D.
NBC2 Executive Director and Principal Investigator

Sonia Wallman, Ph.D.
Executive Director &
Principal Investigator, NBC2

Montgomery County Community College
340 DeKalb Pike
Blue Bell, PA 19422

Phone: 603-969-1063
Email: swallman@biomanufacturing.org
Web: www.biomanufacturing.org



OCEANSIDE
CHAMBER OF
COMMERCE

February 9, 2015

California Community College Board of Governors
c/o Chancellor Brice Harris
1102 Q Street, Suite 4554
Sacramento, CA 95811

Re: MiraCosta College Baccalaureate Degree Pilot Program - **SUPPORT**

Dear members of the California Community College Board of Governors:

The Oceanside Chamber of Commerce wishes to convey its support in favor of MiraCosta College's pilot Baccalaureate Degree Pilot Program in Biomanufacturing.

California needs to produce one million more bachelor's degrees than the state currently produces to remain economically competitive in the coming decades. In Oceanside, there is high demand for education beyond the associate degree level in specific academic and technical disciplines, especially in biotechnology and specifically in biomanufacturing.

MiraCosta College is uniquely poised to help both the biotechnology industry meet an unmet need as well as to help our students prepare for high-wage, local jobs. MiraCosta College's pilot baccalaureate programs will ensure continued economic growth in our community, encourage global competitiveness for our local industry, and allow our students to start great careers.

With its focus on local demand and economic development, the Oceanside Chamber of Commerce throws its full support behind MiraCosta College's baccalaureate degree pilot program.

Sincerely,

David L. Nydegger
President and Chief Executive Officer
Oceanside Chamber of Commerce

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0076
(916) 319-2076
FAX (916) 319-2176

DISTRICT OFFICE
1910 PALOMAR POINT WAY, SUITE 106
CARLSBAD, CA 92008
(760) 929-7998
FAX (760) 929-7999

E-MAIL
Assemblymember.Chavez@assembly.ca.gov

Assembly California Legislature



ROCKY J. CHÁVEZ
ASSEMBLYMEMBER, SEVENTY-SIXTH DISTRICT

COMMITTEES
VICE CHAIR: HIGHER EDUCATION
VICE CHAIR: VETERANS AFFAIRS
EDUCATION
BUDGET
HEALTH
RULES
UTILITIES AND COMMERCE

February 9, 2015

California Community College Board of Governors
c/o Chancellor Brice Harris
1102 Q Street, Suite 4554
Sacramento, CA 95811

Re: MiraCosta College Baccalaureate Degree Pilot Program - **SUPPORT**

Dear members of the California Community College Board of Governors:

I would like to convey my support in favor of MiraCosta College's pilot Baccalaureate Degree Pilot Program in Biomanufacturing.

California needs to produce more bachelor's degrees than the state currently produces to remain economically competitive in the coming decades. In Oceanside, there is high demand for education beyond the associate degree level in specific academic and technical disciplines, especially in biotechnology and specifically in biomanufacturing.

MiraCosta College is uniquely poised to help both the biotechnology industry meet an unmet need as well as to help our students prepare for high-wage, local jobs. MiraCosta College's pilot baccalaureate programs will ensure continued economic growth in our community, encourage global competitiveness for our local industry, and allow our students to start great careers.

With my focus on local demand, education and economic development; I extend my full support behind MiraCosta College's baccalaureate degree pilot program.

Sincerely,

A handwritten signature in black ink that reads "Rocky J. Chavez".

Colonel Rocky J. Chávez
Assemblymember 76th District

February 4, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

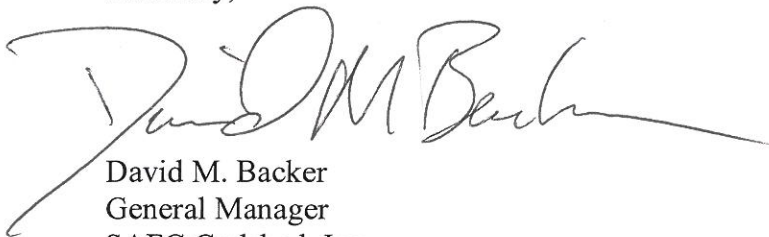
Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As General Manager for SAFC Carlsbad, Inc, a contract manufacturer of biologics based in Southern California, I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. Existing degrees from four-year universities, such as CSU and UC, focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the workforce needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. If you have any questions please feel free to contact me.

Sincerely,



David M. Backer
General Manager
SAFC Carlsbad, Inc.



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DTZ

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Robert Deegan

Palomar College

Stephen Fluhr

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San Diego Business Journal

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Accretive Investments, Inc.

Juanita Hayes

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Keven Lippert

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National University

Chris Roth

Lee & Associates

Matthew Tucker

North County Transit District

Max Villalobos

Kaiser Permanente

Gus Vina

City of Encinitas

Josh Williams

BW Research

Sam Jamal (Ex- Officio)

Camp Pendleton

February 10, 2015

California Community College Board of Governors
c/o Chancellor Brice Harris
1102 Q Street, Suite 4554
Sacramento, CA 95811

Re: MiraCosta College Baccalaureate Degree Pilot Program - **SUPPORT**

Dear members of the California Community College Board of Governors:

The San Diego North Economic Development Council (SDNEDC) wishes to convey its support in favor of MiraCosta College's pilot Baccalaureate Degree Pilot Program in Biomanufacturing.

California needs to produce one million more bachelor's degrees than the state currently produces to remain economically competitive in the coming decades. In North County, there is high demand for education beyond the associate degree level in specific academic and technical disciplines, especially in biotechnology and specifically in biomanufacturing.

MiraCosta College is uniquely poised to help both the biotechnology industry meet an unmet need, as well as to help our students prepare for high-wage, local jobs. MiraCosta College's pilot baccalaureate programs will ensure continued economic growth in our community, encourage global competitiveness for our local industry, and allow our students to start great careers.

With its focus on local demand and economic development, SDNEDC is pleased to support MiraCosta College's baccalaureate degree pilot program.

Sincerely,



Carl S. Morgan
Chief Executive Officer
San Diego North
Economic Development Council



San Diego
Regional
Economic
Development
Corporation

February 11, 2015

California Community College Board of Governors
c/o Chancellor Brice Harris
1102 Q Street, Suite 4554
Sacramento, CA 95811

Re: MiraCosta College Baccalaureate Degree Pilot Program - SUPPORT

Dear Members of the California Community College Board of Governors:

As a 501(c)(6) non-profit organization whose mission is to maximize the San Diego region's economic prosperity and global competitiveness, San Diego Regional Economic Development Corporation (EDC) is pleased to support MiraCosta College's Baccalaureate Degree Pilot Program in Biomanufacturing.

California has the largest biotechnology employment base in the U.S., with more than 235,000 jobs, spanning over 8,000 individual business establishments. Key to retaining these businesses is access to top talent. To remain economically competitive in the coming decades, California needs to produce one million more bachelor's degrees than the state currently produces. There is a high demand for education beyond the associate degree level in specific academic and technical disciplines, especially in biotechnology and specifically in biomanufacturing.

With the majority of the region's life sciences employment concentrated in both the Metro and North County areas, MiraCosta College is uniquely poised to both help the biotechnology industry meet an unmet need, as well as to help our students prepare for high-wage local jobs. MiraCosta College's pilot baccalaureate programs will ensure continued economic growth in our community, encourage global competitiveness for our local industry and allow our students to start great careers.

Our organization is excited about and supportive of the proposed changes in education and workforce preparation and we look forward to supporting MiraCosta College in making these important changes in the San Diego region.

If you have any questions regarding our support, please contact our lead on the project, Ashley Swartout, at 619.615.2976. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Cafferty', written over a light blue horizontal line.

Mark Cafferty
President and CEO

530 B Street
Seventh Floor
San Diego
CA 92101

Ph: 619.234.8484
Fax: 619.234.1935

www.sandiegobusiness.org



<http://www.solano.edu>

Professor Michael Fino
Mira Costa College
1 Barnard Drive
Oceanside, CA 92056

January 27, 2015

Professor Fino

I am anxious to write to lend my enthusiastic support for the proposal to offer a Bachelors degree in biomanufacturing at Mira Costa College. I would like to help you communicate to decision-makers the importance of pursuing this proposal. I can say with confidence that the Biomanufacturing program that you will offer if your proposal receives final approval does not duplicate any existing programs. And I view this degree as essential for California's workforce and economic development, for California maintaining its dominance in this field, and for the career development of our students.

As you know I am in a good position to make these assertions. I designed the biotechnology program for Solano Community College and serve as its Director. The Solano College program also emphasizes biomanufacturing; our program teaches the skills and knowledge required for our graduates to enter the manufacturing sector of the biotechnology industry. Our college has been running this program since 1997 and we have thousands of graduates now employed in the biotech industry. I served as the Southwest Regional Director of Bio-Link, the National Science Foundation-funded national consortium of biotechnology teachers. And I also served as Co-Director of the Northern California Biotechnology Center, the organization of California biotechnology professors teaching in the San Francisco Bay Area that was funded by the California Community College Chancellors office. So I am very familiar with biotechnology programs offered by all colleges in the state, and I am very familiar with the current Mira Costa program and with the proposal that you have submitted.

I am also very familiar with the life science offerings in the University of California and California State University system. Our college has a close relationship with UC Davis, the sole campus in the UC system that offers an undergraduate biotechnology degree. Dr. Karen McDonald, the chairman of their biotech committee, serves on our advisory committee. Also, Dr. Martina McGloughlin, another member of our advisory committee (who also happens to be the wife of one of our faculty members), started the UC Davis biotechnology and served as the director of the University of California Systemwide Biotechnology Research and Education Program which represented the 10 campuses and the 3 national laboratories of the UC system.

I also know the biotechnology offerings in the California State University system. For the last twenty years I have attended the annual biotechnology conference of the CSU system; this is sponsored by CSUPERB, the California State University Program for Education and Research in Biotechnology, and they have been gracious enough to invite community college faculty. This opportunity has allowed me to meet many of our counterparts in the CSU system and to gain a familiarity with their programs.

With this background knowledge, I can say with confidence that your proposed biomanufacturing Bachelors degree program fulfills a niche that is not occupied by any of the four year universities in California. The universities focus on preparing students to enter the research side of the industry; they do not teach the skills and knowledge required to enter the manufacturing sector as you have proposed.

For that reason it has been common for community college biotechnology programs to have students who have already earned a Bachelors degree enter their programs if the student has a career goal of entering biomanufacturing. When we performed a formal survey of California Community Colleges with biotech programs, we found that 25% of the students of these programs already had a Bachelors degree and were attending to extend their skills. This fact provides the evidence that the community college niche is different.

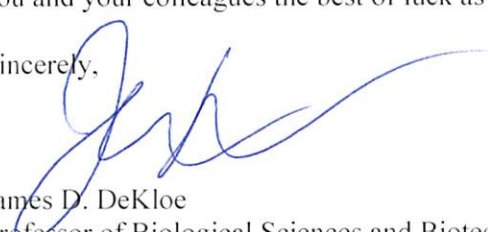
Also, as another piece of evidence, it has been difficult (really impossible) to articulate community college biotechnology classes with any UC or CSU; the courses are simply not the same. Currently our students who transfer lose ground since their biotechnology courses do not transfer.

And this problem with transfer represents the main reason why I find your proposal so exciting. If Mira Costa offered a biomanufacturing program, then we could send our students to your college for a seamless transition into a Bachelors degree. Students would lose no units and could earn a Bachelors degree quicker. It is unlikely that this seamless curriculum coordination will ever occur between our system and either of the other two systems. If Mira Costa had a biomanufacturing Bachelors program, then all of the community colleges in California could feed students into it and those students could complete their Bachelors degrees easier. And they could exit college without a crushing student debt.

The students at Solano Community College come from very modest backgrounds. Tuition increases in the UC and the CSU systems is making it harder every year for them to afford the last two years of college. Our program prides itself on helping these students enter the middle class. The biotechnology field offers a career with a high income and with tremendous opportunities for upward advancement. Mira Costa's Bachelors in biomanufacturing will give these students an option to gain a degree that will aid their upward mobility.

For all of these reasons, I enthusiastically support Mira Costa College's efforts to offer a Bachelors degree in biomanufacturing. The degree will fulfill a need that will not be achieved without it. This degree will benefit the biotechnology industry, the California economy, and most of all, it will provide an option for all of the students in biotechnology programs at all colleges in California. I wish you and your colleagues the best of luck as you move forward.

Sincerely,



James D. DeKloe
Professor of Biological Sciences and Biotechnology
Solano College
4000 Suisun Valley Road
Fairfield, CA 94534



GEERT W. SCHMID-SCHÖNBEIN, PH.D.
DISTINGUISHED PROFESSOR OF BIOENGINEERING AND MEDICINE
CHAIR
DEPARTMENT OF BIOENGINEERING
9500 GILMAN DRIVE
LA JOLLA, CALIFORNIA 92093-0412

TELEPHONE (858) 534-3852
FAX (858) 534-5722
E-MAIL: gwss@bioeng.ucsd.edu

6 February 2015

Dr. Michael Fino
Professor | Chair, Biotechnology
President, Academic Senate
MiraCosta College
One Barnard Drive, MS 8C
Oceanside, California 92056

Dear Michael,

Thank you for writing and the description of your excellent proposal for a baccalaureate program in biomanufacturing.

In answer to your question, there is no overlap in the area you propose on applied biomanufacturing with our education tracks in the bioengineering department.

With best wishes with this terrific idea and regards,

Geert W. Schmid - Schönbein

February 11, 2015

Dr. Sunita Cooke
Superintendent/President
MiraCosta College
1 Barnard Drive
Oceanside, CA 92056

Dear Dr. Cooke,

This letter is written in support of MiraCosta College's proposal to offer a baccalaureate degree in Biomanufacturing in San Diego County. The degree will address a growing unmet need in the Biotechnology industry for employees who have received baccalaureate level preparation for technical and quality-related positions.

As the Pilot Plant Manager for Verdezyne, Inc., I can speak to the strong industry demand for an applied baccalaureate degree with a focus on quality systems and hands-on skills training in process sciences and technology. At Verdezyne we operate both bench-scale and pilot-scale equipment that requires not only a good science background, but the ability to understand on a deeper level what is happening in the process. Many decisions on sustaining the viability of the organisms we are growing require prompt action, and the majority of the time these actions involve the adjustment of parameters on the vessels being used. These are precisely the skills that are taught within the MiraCosta program. If you examine the existing degrees from four-year universities, such as CSU and UC, you will find that they focus on *product* understanding. That is, the biology and chemistry of the product and its mechanisms of action. The proposed degree from MiraCosta focuses not only on that, but additionally on *process* understanding and how companies can manufacture a product of sufficient and consistent quality. There are no baccalaureate programs in the UC or CSU systems that address both the science and compliance in a comprehensive and integrated program of study. The proposal from MiraCosta targets this gap. In my opinion this would be the first time the work force needs of the manufacturing sector of biotechnology are addressed and purposefully designed into an undergraduate educational program.

In conclusion, I believe the MiraCosta College's proposal meets a unique workforce need that cannot be found at any four year college in California. This truly is an opportunity for the community college education system of California to offer the 'best of both worlds' by not only training individuals, but providing the additional opportunity to earn an accredited 4-year science degree that includes the solid foundations required to succeed in the very competitive pharma/biotech industry here in the San Diego area. If you have any questions please feel free to contact me.

Sincerely,



William J. Jankowski, M.S.
Verdezyne Pilot Plant Manager