

REPORT DOCUMENTATION PAGE			Form Approved OMB NO. 0704-0188		
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA, 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 21-01-2015		2. REPORT TYPE Final Report		3. DATES COVERED (From - To) 10-Aug-2011 - 9-Aug-2012	
4. TITLE AND SUBTITLE Final Report: BD LSRFortessa for Tulane DoD ID and Cancer Projects			5a. CONTRACT NUMBER W911NF-11-1-0320		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER 611103		
6. AUTHORS John D. Clements			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAMES AND ADDRESSES Tulane University 1430 Tulane Avenue, EP 15 New Orleans, LA 70112 -2632			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS (ES) U.S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211			10. SPONSOR/MONITOR'S ACRONYM(S) ARO		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S) 59249-LS-RIP.1		
12. DISTRIBUTION AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited					
13. SUPPLEMENTARY NOTES The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.					
14. ABSTRACT Researchers at Tulane University conduct several lines of investigation designed to improve the health of the warfighter. The user of advanced instrumentation is essential to conduct the kind of high quality, cutting-edge, basic and translational research necessary to sustain and advance research focused on enhanced approaches to prevention and treatment of infectious diseases and cancer. The current application requests funds for the purchase of one such piece of advanced instrumentation, a BD Biosciences LSRFortessa 10 color flow cytometer with an additional high throughput system and enhanced forward scatter capabilities to support these research initiatives.					
15. SUBJECT TERMS Vaccines, Bioterrorism, Biothreat, Cancer, Immunity, Prophylaxis					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	15. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT UU	b. ABSTRACT UU	c. THIS PAGE UU			John Clements
					19b. TELEPHONE NUMBER 504-988-5070

Report Title

Final Report: BD LSRFortessa for Tulane DoD ID and Cancer Projects

ABSTRACT

Researchers at Tulane University conduct several lines of investigation designed to improve the health of the warfighter. The user of advanced instrumentation is essential to conduct the kind of high quality, cutting-edge, basic and translational research necessary to sustain and advance research focused on enhanced approaches to prevention and treatment of infectious diseases and cancer. The current application requests funds for the purchase of one such piece of advanced instrumentation, a BD Biosciences LSRFortessa 10 color flow cytometer with an additional high throughput system and enhanced forward scatter capabilities to support these research initiatives.

Enter List of papers submitted or published that acknowledge ARO support from the start of the project to the date of this printing. List the papers, including journal references, in the following categories:

(a) Papers published in peer-reviewed journals (N/A for none)

Received

Paper

TOTAL:

Number of Papers published in peer-reviewed journals:

(b) Papers published in non-peer-reviewed journals (N/A for none)

Received

Paper

TOTAL:

Number of Papers published in non peer-reviewed journals:

(c) Presentations

Number of Presentations:

Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):

(d) Manuscripts

Received Paper

TOTAL:

Number of Manuscripts:

Books

Received Book

TOTAL:

Received Book Chapter

TOTAL:

Patents Submitted

Patents Awarded

Awards

Graduate Students

<u>NAME</u>	<u>PERCENT_SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Post Doctorates

<u>NAME</u>	<u>PERCENT_SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Faculty Supported

NAME

PERCENT SUPPORTED

FTE Equivalent:

Total Number:

Names of Under Graduate students supported

NAME

PERCENT SUPPORTED

FTE Equivalent:

Total Number:

Student Metrics

This section only applies to graduating undergraduates supported by this agreement in this reporting period

The number of undergraduates funded by this agreement who graduated during this period:

The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:.....

The number of undergraduates funded by your agreement who graduated during this period and will continue to pursue a graduate or Ph.D. degree in science, mathematics, engineering, or technology fields:.....

Number of graduating undergraduates who achieved a 3.5 GPA to 4.0 (4.0 max scale):.....

Number of graduating undergraduates funded by a DoD funded Center of Excellence grant for Education, Research and Engineering:.....

The number of undergraduates funded by your agreement who graduated during this period and intend to work for the Department of Defense

The number of undergraduates funded by your agreement who graduated during this period and will receive scholarships or fellowships for further studies in science, mathematics, engineering or technology fields:.....

Names of Personnel receiving masters degrees

NAME

Total Number:

Names of personnel receiving PHDs

NAME

Total Number:

Names of other research staff

NAME

PERCENT SUPPORTED

FTE Equivalent:

Total Number:

Sub Contractors (DD882)

Inventions (DD882)

Scientific Progress

Tulane University purchased the BD Biosciences LSRFortessa in September of 2011. We received an additional quote from the company (attached) that lowered the purchase price to \$248,900 if we purchased before September 15, 2011 and traded in one of our existing flow cytometers. Since then, we completely renovated a suite for the instrument, installed the equipment, and held a series of training classes for potential users. We anticipate that the number of users will increase over the next year because the other available flow cytometers are being relocated to a new Louisiana Cancer Research Consortium building several blocks away.

The Department of Microbiology & Immunology has paid for all reagents (except antibodies) and maintains a service contract on the equipment.

Technology Transfer

Award Number:
W911NF-11-1-0320

TITLE:
BD LSRFortessa for Tulane DoD ID and Cancer Projects

PRINCIPAL INVESTIGATOR:
John D. Clements, Ph.D.

CONTRACTING ORGANIZATION:
Tulane University School of Medicine
New Orleans, LA 70112

REPORT DATE:
December 2012

TYPE OF REPORT:
Final

PREPARED FOR: U.S. Army RESEARCH OFFICE, RESEARCH TRIANGLE PARK,
NC 27709-2211

DISTRIBUTION STATEMENT: (Check one)

- ☒ Approved for public release; distribution unlimited
- ☐ Distribution limited to U.S. Government agencies only;
report contains proprietary information

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.

TABLE OF CONTENTS

Cover 1

SF 298..... 2

Introduction 4

Body 4

Key Research Accomplishments 4

Conclusions..... 6

Attachments 7

INTRODUCTION

Researchers at Tulane University conduct several lines of investigation designed to improve the health of the warfighter. Health-related projects at Tulane University currently funded by the DoD include tissue regeneration, pain management, infectious diseases and cancer. This application focuses on instrumentation to support infectious disease and cancer research. Infectious disease research funded by the DoD includes studies on microbial pathogenesis and development of vaccines and therapeutics (including testing in animal models). Cancer researchers funded by the DoD study mechanisms of disease and development of therapeutics against breast cancer and prostate cancer. In addition, researchers at Tulane University conduct significant amounts of non-DoD funded research that fits programmatically and is of potential interest to the DoD in both of these areas. Much of this non-DoD funded research is currently funded by the National Institutes of Health. These research programs benefit not only the warfighter, but also DoD beneficiaries and society at large.

The use of advanced instrumentation is essential to conduct the high quality, cutting-edge, basic and translational research necessary to sustain and advance research focused on enhanced approaches to prevention and treatment of infectious diseases and cancer. The current application requests funds for the purchase of one such piece of advanced instrumentation, a BD Biosciences LSRFortessa 10 color flow cytometer with an additional high throughput system and enhanced forward scatter capabilities to support these research initiatives.

BODY

Tulane University purchased the BD Biosciences LSRFortessa in September of 2011. We received an additional quote from the company (attached) that lowered the purchase price to \$248,900 if we purchased before September 15, 2011 and traded in one of our existing flow cytometers. Since then, we completely renovated a suite for the instrument, installed the equipment, and held a series of training classes for potential users. A copy of the flyer that was sent to all DOD investigators and all members of the infectious disease community is attached. A list of user over the last year and their related grant support is included below under Key Accomplishments. We anticipate that the number of users will increase over the next year because the other available flow cytometers are being relocated to a new Louisiana Cancer Research Consortium building several blocks away.

The Department of Microbiology & Immunology has paid for all reagents (except antibodies) and maintains a service contract on the equipment.

KEY RESEARCH ACCOMPLISHMENTS

James McLachlan, PhD:

Louisiana Board of Regents Research Competitiveness Subprogram Contract (LEQSF(2012-15)-RD-A-24) "Defining the Role of Anatomical Environments in Shaping CD4 T Cell Responses to Persistent Salmonella Infection"

Tom Voss, PhD:

NIH/NIAID 5R44AI082778-03 "Peptide Inhibitors of Influenza Entry – Fast Track"

HHS/BARDA (Subcontract) "Medical Countermeasures Innovation: Development of Novel Formulations of Influenza Vaccines" PI: Ray Cummings, Ph.D., PATH Seattle

NIH/NIAID R43 AI078654-01A2 (Subcontract) "Surrogate Endpoints for Correlating Protective Immunity to Influenza" PI: Gary Fuji, Molecular Express, Inc.

DTRA-TMTI (Subcontract) "Rapid Development of Pandemic Influenza Antivirals" PI: Patrick Iversen, AVI BioPharma

DTRA-TMTI (Subcontract) "Rapid Development of Dengue Antivirals" PI: Patrick Iversen, AVI BioPharma (PI)

Lisa Morici, PhD:

Defense Threat Reduction Agency HDTRA1-13-C-0002 "Outer membrane vesicle vaccine-mediated protection against aerosolized *B. pseudomallei*"

NIH/NIAID 5U54 AI057156-07 Western Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research - CD004 Morici, L.A. Career Development Award "Immunogenicity and Protective efficacy of novel *B. pseudomallei* subunit vaccines"

John Clements, PhD:

DOD W81XWH-07-1-0136 "Tulane/Xavier Biodefense Vaccine Development/Engineering Project"

DOD W81XWH-10-1-0377 "Tulane/Xavier Biodefense Vaccine Peptide Project"

PATH 102290-002 (Subcontract) "A Toxoid Vaccine Against Heat-Stable Enterotoxin of *E. coli*" PI: James Nataro

Bill & Melinda Gates Foundation OPP1031440 "Adjuvanted intradermal and sublingual immunization with IPV"

Cindy Morris, PhD

NIH R01 HD051998-01A2 "Human cytomegalovirus-induced inhibition of cytotrophoblast invasion"

Sam Landry, PhD:

NIH 4R01AI080367-03 "HIV ENV Epitope Engineering"

Nick Makridakis, PhD:

DOD PC094628

CONCLUSIONS

The use of advanced instrumentation is essential to conduct the high quality, cutting-edge, basic and translational research necessary to sustain and advance research focused on enhanced approaches to prevention and treatment of infectious diseases and cancer. This is not a fee-for-service instrument, but one in which investigators are trained and certified for hands-on use of the equipment. We have trained investigators, postdoctoral fellows and students in seven laboratories, working on a series of federally (NIH/DOD) and non-federally supported projects. We anticipate that training and use of the equipment will increase over the next few months as some existing DOD and infectious disease investigators take advantage of the opportunity, coincident with the relocation of the only other available flow cytometer. This is also the only flow cytometer at Tulane University with a Yellow-Green Laser capable of detecting PE/dsRed and PE-Texas Red/mCherry, which greatly enhances the functionality of the equipment. Availability of this advanced instrumentation is an extraordinary opportunity for investigators at Tulane University and supports research programs that benefit not only the warfighter, but also DoD beneficiaries and society at large.

The Department of Microbiology and Immunology has acquired a new BD LSRFortessa flow cytometer with support from the Defense University Research Instrumentation Program (DURIP). This instrument is available to support any DoD funded projects at Tulane University, as well as infectious disease research at Tulane University funded from any source. This is not a fee-for-service program, but one in which investigators will be trained and certified for hands-on use of the equipment. For additional information, contact either James McLachlan (jmclachl@tulane.edu) or Kerstin Honer zu Bentrup (khonerzu@tulane.edu).

The Fortessa has four solid-state lasers:

- 488 nm blue laser (50 mW)
- 640 nm red laser (40 mW)
- 405 nm violet laser (50 mW)
- 561 nm yellow-green laser (50 mW).

The Fortessa can detect the following 13 fluorometric parameters as well as forward and side scatter properties:

- Blue Laser: FITC/Alexa 488/GFP, PerCP-Cy5.5/PerCP
- Red Laser: APC/AlexaFluor 647, AlexaFluor 700, APC-Cy7/APC-H7
- Violet Laser: BD Horizon V450/Pacific Blue/Marina Blue /Alexa Fluor 405, BD Horizon V500/AmCyan/Qdot525, QDot 605
- Yellow-Green Laser: PE/dsRed, PE-Texas Red/mCherry, PE-Cy5, PE-Cy5.5, PE-Cy7

Additional Details:

- Particle size sensitivity: Resolves 0.5µm particles from background.
- Sample handling: Single tube sampler accepts 12 X 75 mm tubes. No high throughput system is currently available.
- Sorting: No sorting capabilities.
- Software: BD FACSDiva™ software supports data integrity and helps ensure reproducible results by enabling automated cytometer setup. FACS data files can be collected and reanalyzed in offline flow cytometry software packages such as FlowJo (see below).
- A 27 inch iMac computer running Tree Star's FlowJo flow cytometry analysis software is also available for use in the same room (<http://www.flowjo.com/index.php>).

BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
tel: 877.232.8995
fax: 408.954.6306
www.bd.com



Helping all people
live healthy lives

August 11, 2011

Mr. James McLachlan
Tulane University
1430 Tulane Avenue (SL-38)
New Orleans, LA 70112
Ph: 504/988-3521
E-mail: jmclachl@tulane.edu

Reference: Quotation #420062564(Revised 2)

Dear Mr. McLachlan:

Thank you for the opportunity to discuss the **BD LSRFortessa™** system with you. I have enclosed the quotation for this system with the options you requested.

We at BD Biosciences feel that the **BD LSRFortessa™** system offers you performance far superior to any flow cytometer available. We also provide complete training, application support and reliable service to back up your system.

Thank you again for your interest in BD Biosciences. Once you have reviewed the quotation and if you have any further questions, please do not hesitate to contact me at the phone number listed below. If you would like to fax or email your Purchase Order directly to BD Biosciences, please fax to: 408/954-6306 or email to: InstrumentOrders@bd.com. The vendor name and address on your Purchase Order must be: BD Biosciences, 2350 Qume Drive, San Jose, CA 95131. The Tax Exemption Certificate, if applicable, must use the name, Becton, Dickinson & Co.

Sincerely yours,

Kirk Watkins
Senior Instrument Sales Specialist
Central Region
Office: 314/821-4878
BD Biosciences

aml

BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
tel: 877.232.8995
fax: 408.954.6306
www.bd.com



FINANCIAL PROPOSAL

PREPARED FOR:

***Mr. James McLachlan
Tulane University
1430 Tulane Avenue (SL-38)
New Orleans, LA 70112***

QUOTATION DATE:	<i>August 11, 2011</i>
QUOTATION EXPIRATION DATE:	<i>September 15, 2011</i>
REFERENCE QUOTATION NUMBER:	<i>420062564(Revised 2)</i>



BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
USA
Tel: 1-877-232-8995
EIN: 22-076-0120

Quotation

Page:
1 of 5

SOLD-TO NO : 2000039181 SOLD-TO ADDRESS TULANE UNIV MEDICAL CENTER ACCOUNTS PAYABLE 1430 TULANE AVE NEW ORLEANS LA 70112	SHIP-TO NO : 2000033956 SHIP-TO ADDRESS TULANE UNIV MEDICAL CENTER ATTN JAMES MCLACHLAN 1430 TULANE AVE NEW ORLEANS LA 70112 Phone number: 504 988 3521 Contact: JAMES MCLACHLAN	Quote: 420062564 Customer #: 2000039181 Valid From: 07/14/2011 Valid To: 09/15/2011 Payment Terms: Net 30 Days Freight Terms: FOB Origin Frt Ppd & Add
---	---	---

Item	Catalog Description	Catalog No.	Quantity	Unit List Price	Unit Net Price	Extended Net Price
10	LSRFortessa SO B50R40V50YG50 3V CPU	647794L5	1.00 EA	303,275.00	248,900.00	248,900.00



BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
USA
Tel: 1-877-232-8995
EIN: 22-076-0120

Quotation

Page:
2 of 5

SOLD-TO NO : 2000039181 SOLD-TO ADDRESS TULANE UNIV MEDICAL CENTER ACCOUNTS PAYABLE 1430 TULANE AVE NEW ORLEANS LA 70112	SHIP-TO NO : 2000033956 SHIP-TO ADDRESS TULANE UNIV MEDICAL CENTER ATTN JAMES MCLACHLAN 1430 TULANE AVE NEW ORLEANS LA 70112 Phone number: 504 988 3521 Contact: JAMES MCLACHLAN	Quote: 420062564 Customer #: 2000039181 Valid From: 07/14/2011 Valid To: 09/15/2011 Payment Terms: Net 30 Days Freight Terms: FOB Origin Frt Ppd & Add
---	---	---

Item	Catalog Description	Catalog No.	Quantity	Unit List Price	Unit Net Price	Extended Net Price
	BD Special Order LSRFortessa™ Cell Analyzer The BD Special Order LSRFortessa analyzer is designed to meet unique multicolor assay requirements. Based on over 10 years of LSR experience in the support of core laboratories and advanced research requirements, the BD Special Order LSRFortessa puts the power of the proven LSR platform in a smaller compact footprint. The Special Order LSRFortessa can be configured with up to seven lasers from over 16 different wavelength choices. With options on laser wavelength, laser power, and PMT configurations, the Special Order LSRFortessa is completely customer configurable. It can detect up to 18 colors, plus forward scatter (FSC) and side scatter (SSC) simultaneously, and can be field-upgraded later with new laser wavelengths and detectors as future applications require. To increase workflow efficiency, an optional high throughput sampler (HTS) is available for analysis of 96- or 384- well plates. Part number: 647794L5 Special Order BD LSRFortessa 4 laser:2 Blue/3 Red/3Violet/5 Yellow-Green The BD Special Order LSRFortessa (647794L5) includes four solid-state lasers: 488 nm blue laser (50 mW), 640 nm red laser (40 mW), 405 nm violet laser (50 mW), 561 nm yellow-green laser (50 mW). The system will have the ability to detect 2 colors from the blue laser, 3 colors from the red laser, 3 colors from the violet laser, and 5 colors from the yellow-green laser. The detection optics include: BD's patented fiber-coupled octagon technology. The digital acquisition system allows inter- and intra beam					



BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
USA
Tel: 1-877-232-8995
EIN: 22-076-0120

Quotation

Page:
3 of 5

SOLD-TO NO : 2000039181 SOLD-TO ADDRESS TULANE UNIV MEDICAL CENTER ACCOUNTS PAYABLE 1430 TULANE AVE NEW ORLEANS LA 70112	SHIP-TO NO : 2000033956 SHIP-TO ADDRESS TULANE UNIV MEDICAL CENTER ATTN JAMES MCLACHLAN 1430 TULANE AVE NEW ORLEANS LA 70112 Phone number: 504 988 3521 Contact: JAMES MCLACHLAN	Quote: 420062564 Customer #: 2000039181 Valid From: 07/14/2011 Valid To: 09/15/2011 Payment Terms: Net 30 Days Freight Terms: FOB Origin Frt Ppd & Add
---	---	---

Item	Catalog Description	Catalog No.	Quantity	Unit List Price	Unit Net Price	Extended Net Price
	compensation, as well as the ability to threshold on any parameter. Power conditioner, FACS Rinse and FACSClean are included. Optical detectors are configured to detect the following parameters: -Blue Laser: FSC, SSC, FITC/Alexa 488/GFP, PerCP-Cy5.5/PerCP -Red Laser: APC/AlexaFluor 647, AlexaFluor 700, APC-Cy7/APC-H7 -Violet Laser: BD Horizon V450/Pacific Blue/Marina Blue /Alexa Fluor 405, BD Horizon V500/AmCyan/Qdot525, QDot 605 -Yellow-Green Laser: PE/dsRed, PE-Texas Red/mCherry, PE-Cy5, PE-Cy5.5, PE-Cy7 This system also includes the LSRII/Fortessa Workstation with the following specifications: Operating System Windows® XP Professional SP3 Processor Intel Core i5-650 3.2 4MB/1333 DC (CPU) RAM HP 2GB (2x1GB) DDR3-1333 ECC RAM Hard Drives HP 160 GB SATA/3 Gb/s 7,200 rpm HD (1st slot) HP 250 GB SATA/3 Gbs NCQ 7,200 rpm HD (2nd slot)					



BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
USA
Tel: 1-877-232-8995
EIN: 22-076-0120

Quotation

Page:
4 of 5

SOLD-TO NO : 2000039181 SOLD-TO ADDRESS TULANE UNIV MEDICAL CENTER ACCOUNTS PAYABLE 1430 TULANE AVE NEW ORLEANS LA 70112	SHIP-TO NO : 2000033956 SHIP-TO ADDRESS TULANE UNIV MEDICAL CENTER ATTN JAMES MCLACHLAN 1430 TULANE AVE NEW ORLEANS LA 70112 Phone number: 504 988 3521 Contact: JAMES MCLACHLAN	Quote: 420062564 Customer #: 2000039181 Valid From: 07/14/2011 Valid To: 09/15/2011 Payment Terms: Net 30 Days Freight Terms: FOB Origin Frt Ppd & Add
---	---	---

Item	Catalog Description	Catalog No.	Quantity	Unit List Price	Unit Net Price	Extended Net Price
20	DVD Drive HP 16x DVD+/-RW, SuperMulti SATA Networking 1st Ethernet Card: Integrated Gigabit (10/100/1000) 2nd Ethernet Card: Intel Pro 1000 CT GbE NIC FACSDIVA Software v6.2 or later LSRFORTESSA INSTRUMENT TABLE	647741	1.00 EA	2,500.00	0.00	0.00
	Sub-Total:			305,775.00		248,900.00
	Discount(s):			56,875.00		
	Actual Freight					1,100.00
	Net Price Before Tax					250,000.00
	Sales Tax					0.00
	Total					250,000.00

Selling price includes the Trade-in of BD FACSCalibur S/N #E3307.
Customer to provide their own monitors & printer.

TRAINING: Purchase price for each system includes two training provisions. Each training provision is valid for five days of operator training at a BD Biosciences Training Center and is NOT transferable to other courses or on-site training, without an additional fee. Training must take place within one year from the date of installation. Lodging, including breakfast at the hotel, lunches at BD, and a group dinner, are provided by BD during the training. Cost of transportation is not included. To register for training, go to www.bdbiosciences.com/support/training/classroom_based.jsp.

SHIPMENT: Unless otherwise noted. Within 90 days after receipt of purchase order. Accessories ordered, but not delivered with system will be invoiced separately.



BD Biosciences
2350 Qume Drive
San Jose, CA 95131-1807
USA
Tel: 1-877-232-8995
EIN: 22-076-0120

Quotation

Page:
5 of 5

SOLD-TO NO : 2000039181 SOLD-TO ADDRESS TULANE UNIV MEDICAL CENTER ACCOUNTS PAYABLE 1430 TULANE AVE NEW ORLEANS LA 70112	SHIP-TO NO : 2000033956 SHIP-TO ADDRESS TULANE UNIV MEDICAL CENTER ATTN JAMES MCLACHLAN 1430 TULANE AVE NEW ORLEANS LA 70112 Phone number: 504 988 3521 Contact: JAMES MCLACHLAN	Quote: 420062564 Customer #: 2000039181 Valid From: 07/14/2011 Valid To: 09/15/2011 Payment Terms: Net 30 Days Freight Terms: FOB Origin Frt Ppd & Add
---	---	---

Item	Catalog Description	Catalog No.	Quantity	Unit List Price	Unit Net Price	Extended Net Price
------	---------------------	-------------	----------	-----------------	----------------	--------------------

WARRANTY: Twelve-month warranty will begin upon installation or thirty days after the date of shipment, whichever occurs first. This warranty runs only to the original purchaser of the instrument, option, accessory, software or upgrade and applies only to products purchased and installed in the United States by an authorized BD Biosciences (BD) service representative or another party approved by BD Biosciences. BD will install its instrument after shipment or reimburse the purchaser for actual costs incurred to have a third party install the instrument. The maximum reimbursement to purchaser for third party installation shall be \$1,500 for LSRFortessa instruments. The third party installer must be approved in writing by an authorized representative of BD prior to installation for warranty to become effective. BD Biosciences will no longer provide on-site or mail-in printer repair support.

If you would like to fax or email your Purchase Order directly to BD Biosciences, please fax to: 408/954-6306 or email to: InstrumentOrders@bd.com.

(Revised 2 08/11/11)

For Instrument Orders, acceptance is defined as an instrument that meets the vendor's specifications.

For US Orders ONLY: BD Biosciences' policies on Shortages or Damaged Goods, Reagent Returns and Restocking Fees are also available on our website: <http://www.bdbiosciences.com/terms/> and are the Buyer's responsibility to review and understand.

For inquiries regarding Canadian orders, call 1-888-259-0187

August 11, 2011

Quotation #420062564(Revised 2)

Mr. James McLachlan

**BD LSRFortessa™ Flow Cytometer
Maintenance Service Agreement**

5 Day Coverage (Monday through Friday)

This Agreement covers the BD LSRFortessa™ with lasers and one computer workstation (excluding printers) for labor, travel expenses and parts (excluding consumable items) for the following:

- Two (2) Preventive Maintenance Inspections to be performed during a twelve-month period.
Two (2) PM Kits will be provided.
- Software Revisions that are released during the Agreement term.
- Unlimited service visits during the term of this Agreement, Monday through Friday, excluding BD Biosciences holidays.
- 48-hour guaranteed response to a request for emergency on-site service (Monday through Friday, excluding BD Biosciences holidays). If we fail to meet our commitment, a \$500.00 Response Time Credit will be issued (see back: Para.I.C.)
- Under this Agreement, CUSTOMER will be billed at the prevailing hourly rate for labor and travel for service provided on weekends and holidays, minimum 4 hours labor and travel combined.
- Unlimited telephone support for instruments, reagents, and applications will be provided at no additional charge.
- At the time of Service Agreement purchase, you can also purchase Training Voucher at a 15% discount, which are valid for any training courses conducted by the Customer Education Department of BD Biosciences for a period of 18 months from date of purchase.
- Workstation printers are not covered.

Point of Sale Pricing

BD LSRFortessa™ Flow Cytometer System (with Lasers, B,R,V)

Plan	Purchased with Instrument	Comparison Based on Annual Purchases	Estimated Savings
1 Year Plan	\$16,981.20	\$19,080.00	\$2,098.80
2 Year Plan	\$33,199.20	\$39,114.00	\$5,914.80
3 Year Plan	\$48,654.00	\$60,149.70	\$11,495.70
4 Year Plan	\$63,345.60	\$82,237.19	\$18,891.59
5 Year Plan	\$77,274.00	\$105,429.04	\$28,155.04

BD™ LSRFortessa Yellow/Green 561-50mw Laser

Plan	Purchased with Instrument	Comparison Based on Annual Purchases	Estimated Savings
1 Year Plan	\$ 3,150.60	\$ 3,540.00	\$ 389.40
2 Year Plan	\$ 6,159.60	\$ 7,257.00	\$1,097.40
3 Year Plan	\$ 9,027.00	\$11,159.85	\$2,132.85
4 Year Plan	\$11,752.80	\$15,257.84	\$3,505.04
5 Year Plan	\$14,337.00	\$19,560.73	\$5,223.73

Please Note: Prices quoted above are for the BD LSRFortessa™ system and do not include additional options/accessories. Also, BD does provide extended service programs that may be purchased following the one-year warranty. Full service program is available upon request.

August 11, 2011
Quotation #420062564(Revised 2)
Mr. James McLachlan

Special Offer: Discount on Training Purchased With Cytometer

Now you can receive the following discounts on tuition if you pre-purchase additional training at the point-of-instrument sale. Training can be purchased on the instrument purchase order or on a separate purchase order submitted with instrument order.

To receive discount, you will be invoiced in advance and you must pay within 30 days of invoice date.

Note: Tuition and hotel are now sold separately, and the discount applies only to tuition.

Operator Course	Part Number	# Days	List Price*	20% Disc **, ***
BD FACS Aria™/BD FACS Aria II/ BD FACS Aria III	337667	4.5	\$3,300	\$2,640
BD FACS Array™	337674	2.0	\$1,470	No discount
BD FACS Calibur™	337662	4.5	\$3,300	\$2,640
BD FACS Canto™ II	337668	4.5	\$3,300	\$2,640
BD FACS Verse™	653727	3.0	\$2,400	\$1,920
BD Influx™ (BD Spigot software)	644839	4.5	\$3,300	\$2,640
BD Influx™ (BD Software software)	653061	4.5	\$3,300	\$2,640
BD™ LSR II	337664	4.5	\$3,300	\$2,640
BD™ LSR Fortessa	650826	4.5	\$3,300	\$2,640
Hotel Package				
Five nights	654344	-	\$705	No discount
Four nights	654345	-	\$564	No discount

*List price for the operator course includes class materials, lunches, a group dinner, and local transportation between a BD-selected hotel near the training center and BD Biosciences.

List price for the hotel package is limited to the room rate and room tax charges for the indicated number of days at a BD-selected hotel.

**This discounted tuition payment is transferable to any training conducted by BD Biosciences' (BDB) Customer Education Services. If the tuition payment is not used within eighteen (18) months from the date of purchase, the amount paid can be applied as a credit to the then current list price of any training course delivered by BDB's Customer Education Services. You will be responsible for paying the difference of the current list price less the credit.

***Receive a 25% discount off training purchases of \$10,000 tuition or more.

Effective: 8/5/2011b