Proposed Sole Source Purchase Form

Pursuant to New Mexico Procurement law, the UNM Purchasing Department will post your completed form on the UNM Sunshine Portal for 30 days prior to purchase of the goods/services.

I. GENERAL INFORMATION. PLEASE PROVIDE THE FOLLOWING:

<table>
<thead>
<tr>
<th>Date of Request</th>
<th>07/22/19</th>
<th>Requisition Number (If Applicable)</th>
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<tbody>
<tr>
<td>Request Submitted by:</td>
<td>Michael Paffett</td>
<td>Title</td>
</tr>
<tr>
<td>Department</td>
<td>Cancer Center Shared Resources</td>
<td>Email</td>
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<tr>
<td>Proposed Vendor</td>
<td>Olympus</td>
<td>Amount</td>
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Buyer Team - See Commodity list at [http://www.unm.edu/~purch/commcodes.pdf](http://www.unm.edu/~purch/commcodes.pdf)

Provide a basic description of goods/services to be provided:

The Olympus 4-line MITICO TIRF microscope enables imaging of single molecules which are the main focus of our research. Single molecules are difficult to image and require a specialized imaging technique along with the necessary optics. The speed and sensitivity of the proposed microscope expands our research capabilities beyond what is possible with our current equipment.

Why is this purchase needed?

The Olympus 4Line cellTIRF system will advance the imaging capability of the Microscopy Shared Resource and the needs of various Research Centers & Programs across the HSC campus including the Comprehensive Cancer Center; Autophagy, Inflammation & Metabolism (AIM) Center; Signature Programs in Brain & Behavioral Health, Cardiovascular Disease & Metabolism as well as Environmental Health.

II. BASIS FOR SOLE SOURCE PROCUREMENT. CHOOSE APPLICABLE BOX(ES) AND PROVIDE ADDITIONAL INFORMATION, AS REQUESTED:

☒ Proprietary item, technology or service only available from the proposed vendor. (Check box and describe proprietary component)

The Olympus cellTIRF microscopy system represents a significant advance in instrumentation for researchers requiring multi-line (channel) TIRF microscopy as an imaging modality because of its ability to perform critical angle-optimized, multiple laser line, simultaneous TIRF imaging. No other commercial TIRF instrument offers the capability of simultaneously imaging multiple fluorophores or fluorescent proteins under optimized TIRF illumination conditions such that the critical angle and concomitant penetration depth of each wavelength is the same. Furthermore, this system will be outfitted with the new XAPO 60X TIRF objective, with an industry superior flatness and numerical aperture of 1.5. We were able to evaluate this proprietary lens and found it superior its minimal spherical aberration and light transmission qualities compared to the previous generation of Olympus TIRF optics. The ability to optimize the TIRF critical angle on a per laser line basis in multi-channel TIRF experiments offers significant experimental rigor when colocalizing or spatially correlating targets that are labeled with different fluorescent molecules.
☒ Compatibility requirement with existing item, technology or service. (Check box and describe compatibility requirement)

A similar, more complex Olympus TIRF/dSTORM system exists in the laboratory of Dr. Keith Lidke in the Department of Physics. Dr. K. Lidke will be moving his laboratory in October 2019 to the new departmental building currently under construction on the far SW corner of UNM main campus (approx 1 mile from HSC). This move along with the growing TIRF/dSTORM user base utilizing these advanced imaging techniques provided by Olympus has prompted concern that the Shared Resources provide this advanced imaging technology in order to maintain continuity and productivity of many labs belonging to various Centers and Research Programs.

☒ Renewal of support/maintenance/subscription of software, technology or other intellectual property. (Check box and describe)

The Fluorescence Microscopy and Cell Imaging Shared Resource and the Department of Physics have been using Olympus microscopy products for over 15 years without any significant equipment failures or required services beyond regular preventative maintenance and an occasional in-house repair if minor part needing to be replaced. It has been our experience that Olympus produces very robust and serviceable microscopy products. Nonetheless, the Shared Resource has a comprehensive and sustainable instrument management plan for the proposed instrument for this funding support request.

Cost Recovery Plan

The proposed Olympus cellTIRF 4L is the benchmark for turnkey total internal reflection microscopy applications and is considered to be a reliable, serviceable design. Unlike laser scanning confocal microscopes that require expensive service contracts, TIRF systems come with a standard 1 year manufacturers warranty and are generally not sold with service contract agreements because they are much less complicated and more manageable by experienced microscopists. Moreover, these systems do not require an onsite visit by a service engineer to calibrate galvanic scanning mirrors, multiple detectors, laser functionality and a myriad of other optical elements. The Shared Resource possess extensive microscopy experience and means to perform routine inspections such as XYZ drift tests, laser spectral power testing and camera sensor testing. Annual preventative maintenance (~$500/yr) will be performed by our local Olympus trained service technician (Frank Fisk, Biomedical and Industrial Microscope Service) and application/technical support will be provided by the Olympus imaging specialist at no extra charge. In the event that this system experienced a critical failure of an opto-electronic component, such as a laser source or TIRF illuminator, an RMA would be generated with Olympus Technical Service Group for diagnostic testing ($400 flat rate) and is credited to the cost of repair. Although we don’t anticipate any such failures with the newer SPSS/diode laser technology and/or TIRF illuminator we estimate an emergency service budget of $10,000 for any unplanned repairs for these critical components with a small portion allocated for annual preventative maintenance, time for facility staff to perform daily inspections, weekly alignments, routine facility maintenance and incidentals (immersion oil, lens cleaner and paper) by user fees (described below) as part of the Shared Resources normal cost recovery business plan. Furthermore, the Shared Resource has the ability to pool cost recovery fees from 6 other non-confocal other systems not under service contracts to utilize for repairs in the unlikely event that repairs were to exceed $10,000.

☐ Other Basis for Sole Source: Please describe below:
III. SUPPLEMENTAL DETAILS. PLEASE PROVIDE ADDITIONAL INFORMATION AS REQUESTED BELOW:

Describe in detail the unique capabilities of the proposed vendor’s goods/service and/or personnel performing the work and why this constitutes the only source. Focus on what is unique about the goods/service and why no other vendor could meet your needs.

Penetration depth (d) of the evanescent wave is in part determined by the wavelength (λ) of incident light (d = λ(1)/(4π(n(1)^2sin^2 - n(2)^2)^1/2)). Therefore, imaging multiple fluorescent molecules ideally requires that the critical angle for each excitation line is optimized such that the same planar volume is being illuminated by each laser. The Olympus cellTIRF system does this most effectively by using independent laser line delivery and motorized critical angle adjustment points in the cellTIRF illuminator. Each solid-state diode laser has its own wavelength-optimized fiber optic cable for delivery to the cellTIRF illuminator and motorized angle adjustment actuator inside the illuminator for optimization of the critical angle. Other multi-line TIRF systems merge multiple lasers into a single fiber optic and use a single adjustment point, the position of which changes according to the laser line being used; in such a configuration only a single critical angle can be set and represents a compromise for all of the wavelengths in use. Conversely, the Olympus cellTIRF system only requires the user to select the lens they are using, the laser lines they wish to use and the penetration depth (PD) they desire. Once these parameters are set and the user selects <Set PD>, the motorized actuators automatically set the incident angle for each laser such that the critical angle for each produces an evanescent wave giving the desired penetration depth of illumination. Eliminating the need to switch the critical angle as the laser lines change enables image acquisition to proceed more efficiently, without requiring time to change the critical angle (time lag in changing angle as the laser line changes). This represents a significant improvement in efficiency and when coupled with a means for simultaneous image acquisition (e.g. Hamamatsu Gemini) or rapid wavelength switching, enables multiple dynamic processes to be captured simultaneously using TIRF imaging.

Describe the due diligence made to locate other possible sources including communications with other universities, communications with similar providers, web searches, yellow page searches, review of advertisements and trade publications, etc.
The UNMCCC Shared Resource director has existing industry/vendor experience prior to coming to UNM and the Olympus MITICO system represents the industry benchmark for high NA TIRF optics and multi-line selective penetration depths. The resource director did conduct 2 demos with Olympus and Oxford Nanoimaging, described more below. Carl Zeiss, Nikon and Leica do offer TIRF solutions (source from technical spec via webpage searches), but the vendors’ systems are not within our specific requirements for TIRF objective planarity.

List the other vendors who were contacted. Please describe the specs/qualifications/criteria that the other vendors were unable to satisfy.

We contacted and requested a demo Oxford Nanoimaging (ONI) TIRF-dSTORM system because they do utilize the required Olympus TIRF optics in their turn-key system. Although the demo went very well, we found there were several features and factors that we determined to be insufficient for our core facility user needs. First, the system was unable to excite select different penetration depths for the various wavelengths offered. This is a critical feature that we need to investigate various biological processes at different depths. Second, the system was not easily serviceable or modular as compared to the Olympus MITICO 4L. Third, the ONI system due to its lack of in field serviceability required the additional purchase of a service contract. This additional re-occurring cost is not fiscally tenable.