UNIVERSITY OF MISSISSIPPI

Notice of Intent to Certify Sole Source

SS 080

The University of Mississippi (UM) anticipates purchasing the item(s) listed below as a sole source purchase. Anyone objecting to this purchase as a sole source shall follow the procedures outlined below.

Commodity or commodities to be purchased (manufacturer, model, description):

Leica Microsystems Inc. TSC SP8WLL X Confocal Microscope

The need to be fulfilled by this item(s) and why it is the only one that can meet the specific needs of the department:

A Laser Scanning Confocal microscope is the only instrument capable of the broad range of fluorescent detection in living systems, while maintaining a narrow optical section. The faculty in sum have several needs that are uniquely met by the quoted Leica SP8 confocal microscope. These include 1) having the ability to utilize a very broad number of dyes and fluorescent molecules; multi-spectral excitation, 2) being able to precisely select the detection wavelength in order to truly empower simultaneous multi-spectral imaging, e.g., allow us to image multiple dyes at the same time that have relatively small differences in the wavelength of the emitted light, 3) that have a scan head capable of extremely fast scanning modes for rapid collection of imaging data and super sensitive sensors capable of detecting weak light signals, 4) have a large field of view (FOV) for collection images from high definition images from larger samples, 5) a highly precise automated z-galvo movement to collect ultra-thin section, 6) the scope must be fully capable of differential interference contrast (DIC) to image transparent tissues. 1) Multi-spectral excitation: We need the ability to selectively excite a large number of different wavelengths within the visible spectrum, and at least five simultaneously. We also require the ability to select the wavelength and bandwidth of the exiting laser line. The selected Leica SP8 is the only commercially available confocal that comes with a white light laser, capable of providing over 200 laser lines ranging from 470 nm to 650 nm. This confocal microscope will also come with a 442nm violet laser and a 405 ultraviolet laser. These three laser systems provide the broadest spectral coverage for exaction currently available. The selected Leica SP8 is the only commercially available confocal that comes the Acousto-Optical Beam Splitter (AOBS). This device is a sound wave activated prism which allows the experimenter to tune up to eight lines to be simultaneously delivered to the specimen. All visual wavelengths can be tuned, and switching between wavelengths can occur within microseconds. The AOBS system allows the investigator to fully leverage the spectral flexibility of the white light laser. Leica owns the

patent on the AOBS system and is the only one to offer this beam splitter. 2) Multi-spectral detection: We need the ability to simultaneously detect up to five different fluorophores within a single sample. The Leica SP8 has five separate detectors, two are HyD detectors with quantum efficiencies of up to 45%. Each detector has its own control systems, which allow for the needed independence of light collection. Each detector is capable of 1 nanometer steps with as small as 5 nm bandwidth. The high sensitivity of the HyD detectors means that lower laser power can be used, which both protects the viability of the cell that are imaged, and increases the lasers lifetime. These are critical features for our investigators. Leica is the only manufacturer that offers the HyD detectors. 3) Fast scan speeds: Many imaging events occur with microseconds. To meet our speed needs, we require the ability to capture images at a full 512x512 resolution at a rate of at least 25 frames per second. The Leica SP8 comes with a tandem scanner capable of both normal and resonant scanner modes. Although Leica is not the only confocal with a resonant scanner, it has the longest experience with this technology and the Leica resonant scanner outperforms the other commercially available scanners. 4) FOV: We need an FOVs of at least 20mm for our imaging experiments. This will provide higher pixel densities, which enables more quantitative data for each image. Smaller FOVs provide lower quality data for the same effort. The Leica is engineered to have the largest FOV available in a commercial confocal microscope at 22 mm. 5) Precise stage and Z-galvo: High resolution imaging and automated data collection are required by many of our instigators. We need to be able to control the movement in the z plan to at least 15 nm. This property is required to ensure accurate measures of subcellular structures and molecular distances. The Leica comes with a super Z galvo that provides resolution down to 10 nanometers. This galvo motor does not have any backward movements – rebounds, that are found in the galvos of other manufactures. 6) DIC: A common need for our investigators is to produce a bright field image of a cell, organism, or structure, for which the confocal image is overlaid. This provides more context for the fluorescently labeled cells or tissues (e.g., protein expression is limited to the developing heart, which can only be seen in bright field). Since many cells and organisms are transparent, we need to use differential interference contrast microscopy to see the cells or organisms for this overlay. The Leica SP8 comes fully capable of DIC imaging, and is the only one that the can remove all of the necessary polarizers from the light path during confocal imaging. This is important as it provides a much brighter image and better detection of weak signals.

Name of company/individual selling the item and why that source is the only possible source that can provide the required item(s):

Leica Microsystems Inc. is the only provider to offer all of the below needed specifications. • Optimal filling of the back aperture and concentric scanning allows Leica to use the largest FOV at 22mm. This allows for faster acquisition speeds and sample viability. • The Leica SP8 with super Z galvo is highly precise in z direction…10nm resolution. There is no backlash compared to microscope z drives. It also works independent of the objective. This allows for high-speed live xzy sectioning @ 10 Hz • The quoted system includes true prism based spectral detection. Leica spectral detection has a fully tunable detection range from 430 nm to 750 nm – independent from fixed filter barriers. It is completely gapless spectral imaging. This is patented by Leica. This allows for the absolute maximum in flexibility for detection. • Leica offers a White Light Laser: ultimate in dye selection (> 3 trillion combinations) and now with Lightgate for reflection and

filter free imaging. • With Leica our investment is protected. Ultimate upgradeability with the Leica SP8 (such as Tandem Scanner, HyD, MP, STED, CARS and more). • HyD (Leica only) detectors for brilliant imaging: highly sensitive so ideal for high speed or live cell imaging. Great in combination with the tandem scanner. This also helps with cell/sample viability. • The Leica DMi8 is the only system that offers full removal of all DIC components from the light path during confocal imaging. This offers maximum light efficiency and image quality. • Leica offers selection for data transfer mode insuring all acquired images are perfectly suitable for quantification. • Leica LAS X offers a High Content Screening module. This allows for Rapid and reproducible results from automated microscopy and feedback analysis results to screening experiment via CAM interface. • All Leica systems include free on-line technical support from our award winning Technical Applications Group. Direct and live support is provided by 5 Ph.D's, who respond to customer technical questions, via our 800 number. • Access to remote control of our confocal systems for diagnostics and support are provided.

The Chair of Biology became familiar with several commercially available confocal microscopes, and microscope manufacturers. He visited several vendors at the Annual Meeting of the Society for Neuroscience, where he inspected the instruments and asked questions regarding instrument capabilities. From these initial information gathering efforts, he narrowed down the possibilities to three major manufacturers: Zeiss, Nikon, and Leica. He next had personal discussions with representatives from Zeiss, Nikon, and Leica at the University of Mississippi. After which, Nikon and Leica were invited to demo their systems during the Fall of 2017. Zeiss declined to demo after two separate discussions with the Chair and his request that they visit independently with potential major users. It is the Chair's belief that Zeiss representatives felt they wouldn't be competitive. During the demos, faculty from around campus were invited to schedule a time to use the instruments and learn more about what it can do. Several highly interested faculty, from the Dept. of Biology, Department of Biomedical Sciences, and the National Center for Natural Product Research, spent up to 2 hours each with the representatives and the instruments. Many brought their own samples to view and attempted to collect high resolution, multispectral data. After each demo, the Chair sought and received feedback from faulty that had demoed the instruments. These faculty indicated their thoughts on the quality of the instrument, its ease of use, and how well it matched their current and future imaging needs. The chair then had deeper discussion with both the major users and the manufacturer's representatives. After these discussions he made the decision to acquire the Leica SP8 as being the only microscope with the needed constellation of features. These features included the strength of the laser and AOBS system for excitation, and the sensors for fast and sensitive multispectral detection. The strength of the tandem scanner is also important for rapid and flexible scanning. Other features deemed to be superior include the Super-Z galvo for highly accurate optical sections and quantitative measurements of volume, the largest field of view, the overall brightness and clarity of the images, and the powerful suite of software to analyze the data.

Why the amount to be expended for the commodity is reasonable:

Although personalized confocal microscopes can sell for as little as $150,000, these microscopes typically have capabilities for a single or very few lines of excitation coming from a single laser type. They lack precision in motors, and lack a full suite of operating controls, spectral detection

capabilities, and quality light paths. When buying an instrument that will be used by many investigators (>15 laboratories), one needs to expand the flexibility and quality of the instrument. Given the state-of-the-art nature of the Leica SP8, with its HyD detectors, white light laser, and super-Z galvo, the price is very reasonable. In 2012, the Chair of Biology, while at the University of Houston, purchased a similar confocal microscope, but one that lacked the white light laser system, and had someone lower quality optical control systems, for approximately $150,000 more than our quoted price after extensive negotiations had been conducted. The costs of some features have dropped somewhat since that time, but also there have been more technological advances. These confocal systems are integrated imaging systems, complete with the microscopes, scan heads, galvo motorized objectives, and stages, computer controlled systems, lasers and other light sources, and data analysis software. Given the complexity of the system, and the individual costs of all of the different components, the extended price is quite reasonable.

Efforts that the agency went through to obtain the best possible price for the commodity:

The Biology Chair informed Leica of his price point, and explained the Nikon would come in at that price, although with less capable lasers, less capable detectors and a resonant scanner (not tandem). Determined to make the price, Leica offered a larger discount, fewer objectives (that weren't absolutely needed), and they are offering to sell us the microscope we demoed at a reduced cost. They also offered to include the 433 nm laser for free; this is valued at almost $30,000. All of these reductions led to a 20% discount, and provides us with an instrument that has all of the required features for the broad range of researchers on campus.

Submission Instructions and Format of Response from Objecting Parties:

Interested parties who have reason to believe that the item(s) above should not be certified as a sole source should provide information in the following format for UM to use in determining whether or not to proceed with awarding the Sole Source purchase.

1.1 **Interested Party Information**

1.1.1 **Contact Name, Phone Number, Address and email address**

1.1.2 **Company Website URL, if applicable**

1.2 **Objection to Sole Source Certification**

1.2.1 **Interested parties must present specific objections to the Sole Source certification using the criteria listed above.**

1.2.2 **A statement regarding the Interested Party's capabilities as related to this Sole Source Certification Request.**

1.3 **Comments will be accepted at any time prior to Thursday, March**

15, 2018 at 3:00 pm (Central Time) to Katherine Jones at kajones4@olemiss.edu (with Cc: to purchase@olemiss.edu) at The University of Mississippi Procurement Services Department, 164 Jeanette Phillips Drive, PO Box 1848, University, Mississippi 38677. Responses may be delivered by hand, via regular mail, overnight delivery, or e-mail. The envelope or email should reference the sole source number. UM WILL NOT BE RESPONSIBLE FOR DELAYS IN THE DELIVERY OF RESPONSES. It is solely the responsibility of the Interested Parties that responses reach UM on time. Interested Parties may contact Katherine Jones to verify the receipt of their Responses. Responses received after the deadline will be rejected.

If after a review of the submitted notice and documents, UM determines that the commodity in the proposed sole source request can be provided by another person or entity, then UM will withdraw the sole source certification and submit the procurement of the commodity to an advertised competitive bid or selection process.

If UM determines after review that there is only one (1) source for the required commodity, then UM will appeal to the Public Procurement Review Board for approval to purchase.