

## Summer 2013 Ventana Industry Internships

Ventana Medical Systems, Inc. is a member of the Roche Group and a world leader and innovator of tissue-based diagnostic solutions for patients worldwide. Passionately pursuing their mission to improve the lives of all patients afflicted with cancer, the people of Ventana discover, develop, and deliver medical diagnostic systems and biopsy based cancer tests that are shaping the future of healthcare. As the leading supplier of cancer diagnostic systems to the pathology market, Ventana manufactures over 220 cancer tests with related instruments right here in southern Arizona, for 80 countries and 4 million people afflicted with cancer yearly.

In Summer 2013, Ventana Medical Systems provides eight undergraduate and graduate students with internship opportunities in its research laboratories in Oro Valley.

### Internship Guidelines:

- Summer internships last 12 weeks at 40 hours per week. (A concise schedule will be worked out between each intern and her/his group leader prior to the start of the internship.)
- Interns receive a stipend of \$5,000 or \$7,200, respectively, depending on their degree level. Stipends will be paid out in two equal installments, through interns UA Bursar's account.
- Interns must have Continuing Student status and return to the UA for the Fall 2013 semester.
- Graduate students and undergraduates will be considered based on the requirements listed in each project description.
- All candidates must demonstrate health, safety and environmental consciousness, be able to follow all health, safety and environmental regulations, standards and internal requirements.
- An ability to work well both, in a team environment and independently are essential.

**To apply** submit the following materials on or before **April 12, 2013**:

- A cover letter clearly indicating the project (or projects) of interest and how you meet the requirement(s) listed for each project.
- A copy of your CV or resume.
- Two letters of recommendation:
  - A letter from your primary faculty advisor (or lab PI for undergraduates), demonstrating that the advisor is supportive of the internship experience.
  - An additional letter of recommendation from one other member of your advisory committee (graduate students) or person familiar with your research skills (undergraduates).

Please send/email your cover letter and CV to:

Uwe Hilgert, Ph.D.  
BIO5 Institute, University of Arizona  
[hilgert@email.arizona.edu](mailto:hilgert@email.arizona.edu)

Both recommendations letters are due at or before the deadline at the address listed; recommendations sent by email have to be sent through the recommender's business email.

## **Summer 2013 Ventana Internship Project Descriptions**

### ***Assay Transfer Project Description - 1 opening***

The project involves assessment of analytical methods used by Ventana Manufacturing to determine the historical capability of these methods. Assessment may involve producing data by running chemical or biochemical analyses. Knowledge of a broad variety of common analytical methods is desired and statistics knowledge is required. The project will involve making connections with people and mining archived data. Must know how to use Word, Excel, Powerpoint, and must be able to communicate data analyses, interpretation, and conclusions in verbal and written format. Detail-orientation is a plus. Undergraduate students should have completed at least their third year at the start of the internship.

### ***Systems Integration Project Description - 1 opening***

The Systems Integration team seeks an intern to support image analysis. S/He will be working on current and new imaging algorithms for development in ATLAS primary stains. The intern will gain experience in imaging methods including image morphology segmentation and pattern recognition, color deconvolution, method developments for calibration and maintenance of slide scanners, and imaging tool validation methods. The intern must have a strong mathematical foundation to contribute to this work, experience with MATLAB will be helpful. In addition, the intern must know how to use Word, Excel, Powerpoint, and must be able to communicate data analyses, interpretations, and conclusions in verbal and written format.

### ***Molecular Probes Project Descriptions - 3 openings***

Molecular Probes team is focused on development of FDA-approved or cleared nucleic acid tissue-based diagnostics. Main functions will include: selecting and validating designs and formulations of an assay, incorporating an assay design with a designated instrument, optimizing assay conditions and verifying and validating its performance in QSR/ISO-compliant environment, and transferring formulations and methods to manufacturing, QC and QA. Successful candidates will be able to apply molecular biology techniques and gain experience in diagnostic development. The candidates will primarily carry out hands-on lab experiments, with instruction or supervision by experienced technical staff.

*Molecular Probes Project 1: Artifact gallery:* This project will gather all failure modes seen of our commercial ISH assays. It will give each type of failure an appropriate, common name to be used by all groups. Failures will be given a descriptive name that does not imply a failure mode. Failures will be gathered in a table with a picture, the new name, the previous names, the associated assay components (ie only happens with silver detection, happens on any ISH probe, happens only with RNA probes, etc). We will solicit failure modes from our co-workers and ask them to either give us pictures, or give us the respective slide and we will take the picture. We will offer meal tickets for anyone who brings in a new failure mode. Once we have made the table, we will group failures into categories and begin to discuss how to proceed to finding failure root causes and designing recovery protocols. The intern will assist by gathering the images, taking pictures, and helping to assemble the table.

The intern will also assist in researching the root cause for speckling, the main failure mode for the Silver ISH detection method. There are several hypotheses. Next steps will be DOE which

includes volumes on slide at silver detection step, concentrations of probes on slide, and de-paraffinization variations. Subsequent steps will be based on the DOE results. In addition, we'd like to explore local concentrations and swapping out components of the dual ISH open staining procedure (which we haven't ever seen speckling on). The intern would participate in setting up runs, cover-slipping and reading the slides.

*Molecular Probes Project 2: Apollo ISH:* This project will provide an intern with valuable experience in developing and optimizing reagents and *in situ* hybridization (ISH) assays on a novel, next-generation staining system/instrument that is under development. As such the intern will utilize not only molecular biology, but also develop skills working with new hardware, software and troubleshooting. The intern will also gain exposure to a world-class industry development process.

*Molecular Probes Project 3:* This project is to evaluate the effect of different parameter settings on imaging of four-color QDot staining for ISH assays. The technology is a foundation for our multiplexing ISH assay development in the future. The intern will closely work with senior scientists to learn how to set up an ISH assay, how to read slides and also how to take images on iSCAN QD imaging system or other equivalent systems. Intern also will have an opportunity to learn DNA labeling and conjugating QDots to antibodies.

#### ***Detection Development Project Description - 2 openings***

The Detection Development Team seeks two interns with experience in protein chemistry, biochemistry and molecular biology. The focus of the projects is characterization of new enzyme and hapten bioconjugates used in tissue diagnostic assays. The project includes purification, characterization, optimization, and guardbanding of the bioconjugates with associated reagents for both immunohistochemical and *in situ* hybridization assays. Project also includes the development of test methods used to evaluate the bioconjugates and assay components utilizing analytical and functional techniques. This is an exciting opportunity to both gain experience from an industry leader and positively contribute to patient care in the fast paced diagnostics industry. The interns will participate in team work as well as work independently. They will present their data both verbally in a group setting and by generating reports based on Ventana's Quality System requirements.

#### ***Cytology Development Project Description - 1 opening***

The Cytology Development Team seeks a graduate-level intern with experience in light microscopy, cytology, cell biology and lab maintenance. The focus of the projects is characterization of a new dual assay used in cervical cytology. The project includes characterization, optimization, guardbanding, robustness and reproducibility testing of the reagents for three different specimen types. The project also includes the development of test methods used to evaluate the assay components utilizing analytical and functional techniques. This is an exciting opportunity to both gain experience from an industry leader and positively contribute to patient care in the fast paced diagnostics industry. The intern will participate in team work as well as work independently. S/He will present their data both verbally in a group setting and by generating reports based on Ventana's Quality System requirements.