2015 Young Investigator Challenge—We Have a Winner!

Celeste N. Powers MD, PhD

After our 8-month call for articles by up-and-coming academic cytopathologists that netted numerous strong submissions, we were pleased to accept and publish 9 nominee articles from September 2015 through February 2016. Each nominated article was rigorously reviewed and voted on by our Associate Editors and Advisory Board.

We are tremendously pleased to award the title of 2015 *Cancer Cytopathology* Young Investigator to **Dr. Alarice C. Lowe** of Brigham and Women's Hospital in Boston for her submission entitled "Application of Cytologic Techniques to Circulating Tumor Cell Specimens: Detecting Activation of the Oncogenic Transcription Factor STAT3." (Lowe AC, Pignon JC, Carvo I, Drage MG, Constantine NM, Jones N, Kroll Y, Frank DA, Signoretti S, Cibas ES. *Cancer Cytopathol*. 2015;123:696-706).

Dr. Alarice C. Lowe

Dr. Lowe's submission was published in our December 2015 issue and earned consistently high marks among the voting editors, who praised the study's originality, strong design, and potential importance for cytopathologists.

Below, you will find a Q&A with Dr. Lowe, followed by the abstract of her winning submission. In recognition of her win, our Young Investigator will receive an award and an appointment to our Editorial Board. Congratulations again to Dr. Lowe and her coauthors.

Our 2016 challenge is open — details can be found at cytochallenge.com. We hope to see your submission soon!

Q&A WITH 2015 YOUNG INVESTIGATOR ALARICE C. LOWE, MD

What drew you to the practice of cytopathology?

One of many things that drew me to pathology was the amazing breadth and diversity of disease that I would continue to be exposed to and stimulated by over the course of my career. Cytopathology is the epitome of that aspect of pathology; as a cytopathologist, I see dozens of specimen types from a variety of organ systems in a single day. As a cytopathologist, I also have the rare privilege of patient interaction when performing fine-needle aspiration biopsies.

Why did you gravitate to circulating tumor cell research?

Technology and our understanding of disease are constantly improving. I see circulating tumor cell (CTC) testing as an extension of what cytopathologists and cytotechnologists have been doing for decades: trying to obtain the most clinically relevant information for patients and doctors via the least invasive methods possible.

What additional investigations or directions would you like to see in circulating tumor cell research?

The CTC field is still in its infancy with respect to clinical application. We know how to isolate and evaluate these cells, but still need to determine how we can best use the information that we glean from them to treat

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patients; much of this work is ongoing. I envision us being able to use CTC testing to identify and treat tumor recurrences before they form masses large enough to be noted on imaging studies. Eventually, I hope we are able to develop whole-blood "screening" tests to function in a similar capacity, before a malignant clone establishes itself.

Where do you see the fields of cytopathology and molecular pathology in 5 years?

I think that molecular pathology will continue to integrate in the field of oncologic pathology and increasingly become a required component of tumor characterization at the time of initial diagnosis and over the course of treatment. As molecular testing evolves to require fewer cells, I think that cytology should play a larger role in providing diagnostic samples.

As a young investigator, what sources do you use? People? Conferences? Publications? Print? Online?

All of the above! I am constantly learning from my colleagues down the hall and from around the world. Online journals are an amazing resource, but I still enjoy holding a printed journal in my hand and using a highlighter and pen to note key points.

What advice would you give to young investigators entering the field?

A supportive environment is key to success. None of this work would have been possible without the generosity of my chairman and department. But while most people think of institutional support, don't forget to seek out the support of other colleagues as well! The support of other pathologists, cytotechnologists, administrative and lab staff, and collaborators, was vital to this research.

Speaking as a representative of your generation of cytopathologists, how do you think traditional outlets such as journals should best access your group?

Continue publishing high-quality research and we will be the ones looking for you!

ABSTRACT

BACKGROUND: The circulating tumor cell (CTC) field is rapidly advancing with the advent of continuously improving technologies for enriching these rare neoplastic cells from blood. CTC enumeration provides prognostic information, and CTC characterization has the potential to provide more useful information for the clinical decision-making process in this era of personalized medicine and targeted therapeutics. Proof-of-principle studies have shown that CTC samples can be characterized with a variety of techniques in the research laboratory environment. The goal of the current study was to validate routine cytologic techniques and immunohistochemical markers in CTC samples in a clinical cytology laboratory, using inducible phosphorylated signal transducer and activator of transcription 3 (pSTAT3) as a clinically important example and Ki-67 as a positive control.

METHODS: Whole blood from noncancer patients was spiked with breast cancer cell lines with constitutive or inducible pSTAT3 expression and underwent CTC processing in the CellSearch system. The resulting CTC samples were subjected to various cytologic/immunocytochemical techniques and were compared with non–CTC-processed cultured cell controls.

RESULTS: CTC-processed samples showed a morphology comparable to that of controls in cytospin, ThinPrep, and cell block preparations. Immunocytochemistry for Ki-67 and pSTAT3 provided biological information from CTC samples, showing uniform Ki-67 staining across all samples, pSTAT3 positivity in the constitutive and induced cells, and an absence of pSTAT3 expression in the noninduced cells, as expected.

CONCLUSIONS: CTC samples can be processed in the cytology laboratory with routine methods. CTC morphologic and immunophenotypic analysis can be easily integrated into the existing clinical workflow, moving the field closer to a true peripheral blood liquid biopsy for cancer patients. ***Cancer (Cancer Cytopathol)*** **2015;123:696-705.** *© 2015 American Cancer Society.*