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Editorial

Diagnostic, Prognostic, and Predictive Molecular Biomarkers and the Utility of Molecular Imaging in Common Gastrointestinal Tumors

Michael O. Idowu,[1] Jennifer Laudadio,[2] and Kathryn Rizzo[1]

[1] *VCU Medical Center, MCV Campus, P.O. Box 980662, Richmond, VA 23298-0662, USA*
[2] *Department of Pathology, University of Arkansas for Medical Sciences, 4301 W. Markham Street, No. 517, Little Rock, AR 72205, USA*

Correspondence should be addressed to Michael O. Idowu; midowu@vcu.edu

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The exponential increase in the use of molecular biomarkers as diagnostic, prognostic, and predictive aids in the management of cancer patients highlights the increasing importance of molecular biology in oncology. The clinical utility of some molecular biomarkers like *KRAS* (Kirsten rat sarcoma viral oncogene homolog), *BRAF* (B-Raf protooncogene, serine/threonine kinase), *PIK3CA* (phosphatidylinositol-4,5-bisphosphate 3-kinase, catalytic subunit alpha), *KIT* (commonly known as cKit) (v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog), *ERBB2* (commonly known as HER2) (erb-b2 receptor tyrosine kinase 2), and *EGFR* (epidermal growth factor receptor) among others has been validated in gastrointestinal and pancreatobiliary tumors. However, the clinical utility of some of molecular biomarkers is still being investigated and validated. Although technically not a "molecular biomarker," the utility of "molecular imaging" is being elucidated.

This special issue covers some of the biomarkers currently in current clinical use and others being investigated, including the following: (i) *MMP14* (previously known as *MT1-MMP*) (matrix metallopeptidase 14 (membrane-inserted) or previously known asmatrix metalloproteinase 14 (membrane-inserted)) and role in colorectal cancer, potential utility being described in other cancers [1–4], (ii) *SLC6A14* (solute carrier family 6 (amino acid transporter), member 14) and potential role in pancreatic cancer, potential utility in other cancers being described [5–7], (iii) molecular profiling [8–14] of tumors to detect potentially actionable mutation or variant in pancreatic cancers, and (iv) potential utility of Raman spectroscopy in evaluation of gastrointestinal lesions. Potential utility of this technology has been described in other tumors [15–20].

Michael O. Idowu
Jennifer Laudadio
Kathryn Rizzo

References

[1] Y. Li, G. Cai, S. Yuan et al., "The overexpression membrane type 1 matrix metalloproteinase is associated with the progression and prognosis in breast cancer," *American Journal of Translational Research*, vol. 7, no. 1, pp. 120–127, 2015.

[2] D. Trudel, P. Desmeules, S. Turcotte et al., "Visual and automated assessment of matrix metalloproteinase-14 tissue expression for the evaluation of ovarian cancer prognosis," *Modern Pathology*, vol. 27, no. 10, pp. 1394–1404, 2014.

[3] H. Wang, X. Zhang, L. Huang, J. Li, S. Qu, and F. Pan, "Matrix metalloproteinase-14 expression and its prognostic value in cervical carcinoma," *Cell Biochemistry and Biophysics*, vol. 70, no. 2, pp. 729–734, 2014.

[4] T.-H. Yan, Z.-H. Lin, J.-H. Jiang et al., "Matrix metalloproteinase 14 overexpression is correlated with the progression and poor prognosis of nasopharyngeal carcinoma," *Archives of Medical Research*, 2015.

[5] N. Gupta, P. D. Prasad, S. Ghamande et al., "Up-regulation of the amino acid transporter $ATB^{0,+}$ (SLC6A14) in carcinoma of the cervix," *Gynecologic Oncology*, vol. 100, no. 1, pp. 8–13, 2006.

[6] S. Karunakaran, S. Ramachandran, V. Coothankandaswamy et al., "SLC6A14 ($ATB^{0,+}$) protein, a highly concentrative and broad specific amino acid transporter, is a novel and effective

drug target for treatment of estrogen receptor-positive breast cancer," *The Journal of Biological Chemistry*, vol. 286, no. 36, pp. 31830–31838, 2011.

[7] S. Karunakaran, N. S. Umapathy, M. Thangaraju et al., "Interaction of tryptophan derivatives with SLC6A14 ($ATB^{0,+}$) reveals the potential of the transporter as a drug target for cancer chemotherapy," *Biochemical Journal*, vol. 414, no. 3, pp. 343–355, 2008.

[8] J. Bogaert and H. Prenen, "Molecular genetics of colorectal cancer," *Annals of Gastroenterology*, vol. 27, no. 1, pp. 9–14, 2014.

[9] A. E. Cyr and J. A. Margenthaler, "Molecular profiling of breast cancer," *Surgical Oncology Clinics of North America*, vol. 23, no. 3, pp. 451–462, 2014.

[10] D. K. Dutta and I. Dutta, "Origin of ovarian cancer: Molecular profiling," *Journal of Obstetrics and Gynecology of India*, vol. 63, no. 3, pp. 152–157, 2013.

[11] A. L. Richer, J. M. Friel, V. M. Carson, L. J. Inge, and T. G. Whitsett, "Genomic profiling toward precision medicine in non-small cell lung cancer: getting beyond EGFR," *Pharmacogenomics and Personalized Medicine*, vol. 8, pp. 63–79, 2015.

[12] J. R. Schoenborn, P. Nelson, and M. Fang, "Genomic profiling defines subtypes of prostate cancer with the potential for therapeutic stratification," *Clinical Cancer Research*, vol. 19, no. 15, pp. 4058–4066, 2013.

[13] S. L. Wood, J. A. Westbrook, and J. E. Brown, "Omic-profiling in breast cancer metastasis to bone: implications for mechanisms, biomarkers and treatment," *Cancer Treatment Reviews*, vol. 40, no. 1, pp. 139–152, 2014.

[14] C. Wu, J. M. Schwartz, G. Brabant, and G. Nenadic, "Molecular profiling of thyroid cancer subtypes using large-scale text mining," *BMC Medical Genomics*, vol. 7, supplement 3, article S3, 2014.

[15] E. M. Barroso, R. W. Smits, T. C. Bakker Schut et al., "Discrimination between oral cancer and healthy tissue based on water content determined by Raman spectroscopy," *Analytical Chemistry*, vol. 87, no. 4, pp. 2419–2426, 2015.

[16] K. Eberhardt, C. Stiebing, C. Matthäus, M. Schmitt, and J. Popp, "Advantages and limitations of Raman spectroscopy for molecular diagnostics: an update," *Expert Review of Molecular Diagnostics*, pp. 1–15, 2015.

[17] K. Kong, C. Kendall, N. Stone, and I. Notingher, "Raman spectroscopy for medical diagnostics—from in-vitro biofluid assays to in-vivo cancer detection," *Advanced Drug Delivery Reviews*, 2015.

[18] S. Rubina and C. M. Krishna, "Raman spectroscopy in cervical cancers: an update," *Journal of Cancer Research and Therapeutics*, vol. 11, no. 1, pp. 10–17, 2015.

[19] T. Tolstik, C. Marquardt, C. Beleites et al., "Classification and prediction of HCC tissues by Raman imaging with identification of fatty acids as potential lipid biomarkers," *Journal of Cancer Research and Clinical Oncology*, vol. 141, no. 3, pp. 407–418, 2015.

[20] L. P. Ye, J. Hu, L. Liang, and C. Y. Zhang, "Surface-enhanced Raman spectroscopy for simultaneous sensitive detection of multiple microRNAs in lung cancer cells," *Chemical Communications*, vol. 50, no. 80, pp. 11883–11886, 2014.