



NEXT GENERATION SEQUENCING IN THE CLINICAL MOLECULAR DIAGNOSIS OF CANCER

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This CE test covers all articles in the cover story section. The Cover Story and Clinical Issues published in this month's *MLO* are peer-reviewed.

CE learning objectives and CE questions prepared by Masih Shokrani, PhD, MT(ASCP), Clinical Laboratory Sciences Program, College of Health and Human Sciences, Northern Illinois University, DeKalb, IL.

CE QUESTIONS

- 1. How many human cancer-associated genes have been identified, up to this date?**
 - a. more than 350
 - b. less than 200
 - c. about 55
 - d. less than 35
- 2. Cancer accounts for what proportion of deaths worldwide?**
 - a. one in two
 - b. one in four
 - c. one in eight
 - d. one in eighty
- 3. Which of the following can cause cancer?**
 - a. genetic factors
 - b. environmental factors
 - c. lifestyle factors
 - d. all of the above
- 4. HER2/neu is targeted by Herceptin in breast cancer cells.**
 - a. TRUE
 - b. FALSE
- 5. Somatic mutations identified by sequencing can be classified as _____.**
 - a. "driver" mutations
 - b. "passenger" mutations
 - c. both a and b
 - d. neither a nor b
- 6. Next Generation Sequencing (NGS) enables labs to simultaneously and cost-effectively sequence complete genomes of individuals.**
 - a. TRUE
 - b. FALSE
- 7. How many sequences can be produced by NGS at once?**
 - a. less than one hundred
 - b. only a few hundred
 - c. thousands to millions
 - d. half a dozen
- 8. Which of the following is a provider of second-generation sequencing platforms on the market?**
 - a. the HiSeq 2000 from Illumina
 - b. the 454 Genome Sequencer from Roche
 - c. the Applied Biosystems SOLiD system
 - d. all of the above
- 9. Which of the following contribute(s) to progression to cancer?**
 - a. a single nucleotide change
 - b. structural chromosomal changes
 - c. variations in copy number
 - d. all of the above
- 10. The proposed main advantage(s) for using NGS in the management of cancer include(s) the following:**
 - a. Data generated from the complete molecular profiling of the cancer genome can be used for the accurate molecular diagnosis and classification of cancer types.
 - b. Data generated can be used to predict individual prognosis and likely response to treatment.
 - c. NGS provides a more clinically useful tool for personalized detection of recurrence.
 - d. all of the above
- 11. Which of the following pose(s) a challenge for implementing NGS in the clinical lab?**
 - a. cost
 - b. sample size
 - c. method validation and proficiency testing
 - d. all of the above

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12. For cancer patients, data from sequencing technologies should ideally be available within _____ of sampling.

- a. a few days
- b. a few weeks
- c. a few months
- d. a few years

13. Cytokines play a role in _____.

- a. hematopoiesis
- b. cell growth
- c. cell differentiation
- d. all of the above

14. Cytokines have been implicated in which of the following disorders?

- a. autoimmune disorders
- b. cancer
- c. septic shock
- d. all of the above

15. An inhibitor of cytokine actions, such as anti-IL-2 receptor, has utility in reducing graft rejection in transplant patients.

- a. TRUE
- b. FALSE

16. Which of the following techniques can be used to measure cytokines?

- a. bioassays
- b. immunoassays
- c. flow cytometry
- d. all of the above

17. What is/are the main advantage(s) of immunoassays?

- a. ability to be automated
- b. excellent sensitivity for analytical performance
- c. both a and b
- d. neither a nor b

18. What is the advantage of using flow cytometry for cytokine measurement?

- a. complexity of testing
- b. rapid analysis
- c. background induced autofluorescence
- d. requirement for negative control for cutoff levels

19. Multiplexed cytokine sandwich immunoassays are not capable of measuring many cytokines at the same time.

- a. TRUE
- b. FALSE

20. Which of the following factors can contribute to inaccurate measurement of cytokines?

- a. intra-individual variations
- b. short half-lives
- c. presence of nonspecific inhibitors
- d. all of the above

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CE Test on NEXT GENERATION SEQUENCING IN THE CLINICAL MOLECULAR DIAGNOSIS OF CANCER

PLUS Cytokines: Utility and Laboratory Measurement

December 2011

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