

## Continuing Education Questions

SPRING 2010

To receive 2.0 contact hours of basic level P.A.C.E.\* credit for the **Focus: Nanotechnology** questions, insert your answers in the appropriate spots on the answer sheet that follows; then complete and mail the form as directed.

1. Which of the following scientists was the first to lecture about the possibility of manipulating atoms?
  - A. Eric Drexler
  - B. Theodore Fulton
  - C. Richard Feynman
  - D. Buckminster Fuller
2. The sixty carbon atoms resembling soccer balls have been termed:
  - A. Fullerenes
  - B. Nanodrops
  - C. Nanocarbs
  - D. Geodesic spheres
3. An application in the military for nanotechnology is:
  - A. Body armor
  - B. High speed bullets
  - C. Food preservation
  - D. Production of "clean" nuclear energy
4. Nanotechnology is defined as technology and research in the range of:
  - A. 100- 1000 nanometers
  - B. 10-100 nanometers
  - C. 1-100 nanometers
  - D. 1-10 nanometers
5. An unfolded nanotube might best be described as resembling
  - A. a layer of bricks in rectangular array.
  - B. chicken wire in hexagonal lattices.
  - C. the inside of a plastic drinking straw.
  - D. parallelogram-shaped crystals.
6. Nanotechnology drug delivery is:
  - A. less toxic than traditional chemotherapy
  - B. only administered intravenously
  - C. not available in the United States
  - D. only used for asthma treatment
7. A nanotechnology FDA approved test for respiratory viruses uses:
  - A. Quantum dots
  - B. Magnetic nanoparticles
  - C. Gold nanoparticles
  - D. Silver nanoparticles
8. A nanotechnology procedure has been developed for which of the following bacteria?
  - A. Staphylococcus aureus
  - B. Bordetella pertussis
  - C. Listeria monocytogenes
  - D. Clostridium difficile
9. Which of the following elements has been used to repair broken bones?
  - A. Copper
  - B. Platinum
  - C. Gold
  - D. Titanium
10. Nanotechnology may provide a means for more efficiently producing:
  - A. food, energy and a healthier environment.
  - B. nuclear, conventional and biological weapons.
  - C. reliable weather engineering, thus stabilizing climate worldwide.
  - D. fossil fuels and geothermal energy.
11. Some scientists believe that nanotechnology will:
  - A. result in greater reliance upon natural resources.
  - B. enable construction of nanomachines

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- atom-by-atom.
- C. cause the starvation/over-population predicted by Thomas Malthus.
- D. cause a social upheaval due to the loss of jobs.
12. Nanotechnologists predict that:
- A. energy-saving 'smart paints' can reduce heat loss by reflecting infra-red radiation.
- B. 'green' electricity may be produced from exhaust of military turbine aircraft.
- C. only 'a' is true.
- D. 'a' and 'b' are both true.
13. Which predicted 21<sup>st</sup> century crises will nanotechnology attempt to overcome?
- A. unemployment, a sagging economy, obesity, toxic wastes and infectious diseases
- B. HIV/AIDS, declining atmospheric CO<sub>2</sub>, global warming, and species extinction
- C. rising medical costs, loss of polar ice, rising sea levels, light pollution, genetic engineering
- D. accelerating industrialization, population growth, starvation, natural resource depletion and environmental deterioration
14. Regarding nanotechnology regulatory agencies, which statement is most accurate?
- A. The U.S. government has established safety of nanomaterials in the environment.
- B. Nanomaterials in food and skin products have been banned by the FDA.
- C. The EPA has recently announced new research into nanomaterial safety.
- D. MSDS's on nanomaterials are well-documented and very thorough.
15. What type of exposure is most likely to potentially put you "at risk" with nanomaterials?
- A. gastrointestinal tract
- B. skin
- C. lungs
- D. eyes and mucous membranes
16. With regard to the ability of nanoparticles to penetrate skin, the data show (at present) that:
- A. many scientists disagree at present on this issue, and there are conflicting data.
- B. nanoparticles can definitely cross the barrier posed by intact skin.
- C. nanoparticles are not able to cross the barrier posed by intact skin.
- D. this point is not significant, since nanomaterials are already present in some cosmetics.
17. The most widely accepted information about safety and documented information for laboratory professionals comes (originally) from:
- A. data in the peer-reviewed scientific literature.
- B. the ASCLS.
- C. the CDC only.
- D. the National Information Library (NIL) on nanotechnology.
18. In what products are nanomaterials already present?
- A. only in materials already present in nature
- B. primarily, in clinical diagnostic kits
- C. only in products such as tennis rackets, bicycle frames and such
- D. in cosmetics, food additives, sports gear, and some clinical diagnostic kits.
19. Which agency was formed by the FDA to evaluate specific problems that may arise from using nanomaterials?
- A. National Institute of Occupational Health and Safety
- B. Occupational Safety and Health Administration
- C. Nanotechnology Task Force
- D. Environmental Protection Agency
20. Where can I find the most reliable source of information concerning laboratory safety that is currently accepted about nanomaterial safety?
- A. Material Safety Data Sheets
- B. many official and non-official internet sites
- C. the American Chemical Society
- D. an online journal entitled "Nanowerk"

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A certificate of completion will be awarded to participants who achieve a passing grade of 70% or better. Participants should allow eight weeks for notification of scores and receipt of certificates.

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## Answers

Circle correct answer.

- |             |             |
|-------------|-------------|
| 1. a b c d  | 12. a b c d |
| 2. a b c d  | 13. a b c d |
| 3. a b c d  | 14. a b c d |
| 4. a b c d  | 15. a b c d |
| 5. a b c d  | 16. a b c d |
| 6. a b c d  | 17. a b c d |
| 7. a b c d  | 18. a b c d |
| 8. a b c d  | 19. a b c d |
| 9. a b c d  | 20. a b c d |
| 10. a b c d |             |
| 11. a b c d |             |

## Participant Information

Please circle the most appropriate answers.

1. Is this program used to meet your CE requirements for:  
(a) state license (b) NCA (c) employment (d) other
2. Did these articles achieve their stated objectives?  
(a) yes (b) no
3. How long did it take you to complete both the reading and the quiz? \_\_\_\_\_ minutes
4. What subjects would you like to see addressed in future Focus articles?



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