



## HEPCIDIN: THE LINK TO UNDERSTANDING IRON REGULATION

MLO and Northern Illinois University (NIU), DeKalb, IL, are co-sponsors in offering continuing education units (CEUs) for this issue's article on **HEPCIDIN: THE LINK TO UNDERSTANDING IRON REGULATION**. CEUs or contact hours are granted by the College of Health and Human Sciences at NIU, which has been approved as a provider of continuing education programs in the clinical laboratory sciences by the ASCLS P.A.C.E.<sup>®</sup> program (Provider No. 0001) and by the American Medical Technologists Institute for Education (Provider No. 121019; Registry No. 0061). Approval as a provider of continuing education programs has been granted by the state of Florida (Provider No. JP0000496). Continuing education credits awarded for successful completion of this test are acceptable for the ASCP Board of Registry Continuing Competence Recognition Program. After reading the articles in the cover story section, answer the following test questions and send your completed test form to NIU along with the nominal fee of \$20. Readers who pass the test successfully (scoring 70% or higher) will receive a certificate for 1 contact hour of P.A.C.E.<sup>®</sup> credit. Participants should allow four to six weeks for receipt of certificates.

**The fee for this continuing education test is \$20.**

The October Cover Story, Lab Management, and Clinical Issues are peer reviewed.

Cover story objectives and CE questions written/approved by Masih Skokrani, PhD, MT(ASCP), Clinical Laboratory Sciences Program, College of Health and Human Sciences, Northern Illinois University, DeKalb, IL.

The October CE test covers only the material in the article "Hepcidin: The link to understanding iron regulation."

### CE QUESTIONS

- Which of the following statement(s) about hepcidin is/are correct?**
  - Hepcidin production has been shown to be unregulated with increased serum iron.
  - By acting on ferroportin, hepcidin decreases the amount of iron release into the blood.
  - Both a and b.
  - Neither a nor b.
- Which of the following conditions lead to change in hepcidin production?**
  - malignancies
  - infections
  - rheumatologic autoimmune diseases
  - All of the above.
- Which of the following statement(s) about iron metabolism is/are true?**
  - Iron found from plant sources must first be oxidized prior to absorption.
  - Iron is bound by the transferrin.
  - Generally iron is not sufficiently recycled in the body.
  - All of the above.
- Hepcidin lowers serum iron concentration by promoting intestinal iron absorption.**
  - TRUE
  - FALSE
- Anemia of inflammation is broadly characterized by \_\_\_\_.**
  - increased serum iron
  - increased transferrin
  - high ferritin
  - All of the above.
- Production of which of the following cytokines is seen in malignancies and infections that lead to a chronic inflammatory state:**
  - tumor necrosis factor-alpha
  - interleukin-6
  - Both a and b.
  - Neither a nor b.
- It has been demonstrated that mice with anemia of inflammation treated with anti-hepcidin antibodies showed improvement of anemia.**
  - TRUE
  - FALSE
- Hepcidin is a \_\_\_\_ that is produced by the liver and encoded by the \_\_\_\_ gene.**
  - peptide, HAMP
  - protein, HMG
  - amino acid, CMT1
  - fat, BMP
- Mutations that disrupt hepcidin production have been shown to cause hereditary hemochromatosis.**
  - TRUE
  - FALSE
- It has been shown that \_\_\_\_ levels of hepcidin have antimicrobial activity.**
  - high
  - low
  - very low
  - Both a and c.
- Complications of hemochromatosis include \_\_\_\_.**
  - constrictive cardiomyopathy
  - liver failure with cirrhosis
  - gray discoloration of the skin
  - All of the above.
- Chronic inflammatory states can lead to anemia of inflammation through decreased hepcidin.**
  - TRUE
  - FALSE
- Gene mutations in the HFE, hemojuvelin, or \_\_\_\_ result in reduction in hepcidin production.**
  - CAD
  - hepcidin
  - IL-10
  - Both a and b

14. Patients with renal transplants have \_\_\_\_\_ levels of hepcidin patients with CAD than those without CAD.
- lower
  - higher
  - Both a and b.
  - Neither a nor b.
15. Hepcidin levels are currently measured in the laboratories by \_\_\_\_\_.
- immunochemical methods
  - weak cation exchange chromatography
  - time of flight mass spectrometry (TOFMS)
  - All of the above.
16. Comparing hepcidin levels from different laboratories needs to currently be analyzed within the context of the laboratories' reference ranges.
- TRUE
  - FALSE
17. Which of the following is an indication that hepcidin may serve as an inflammatory marker?
- elevated hepcidin level correlated with elevated C-reactive protein.
  - elevated hepcidin levels correlated with elevated levels of IL-6.
  - elevated hepcidin levels correlated with elevated levels of fibrinogen.
  - All of the above.
18. Iron transporter ferroportin is present in \_\_\_\_\_.
- enterocytes
  - macrophages
  - hepatocytes
  - All of the above.
19. Immunoassays have shown some difficulty in anti-hepcidin reagents because the hepcidin molecule is a rather \_\_\_\_\_.
- large polypeptide
  - small peptide
  - very large fat molecule
  - small fat molecule
20. Hepcidin measurements have not been standardized due to number of causes such as \_\_\_\_\_.
- assay differences
  - different calibration solutions
  - Both a and b.
  - Neither a nor b.

## TEST ANSWER FORM

### CE Test on HEPCIDIN: THE LINK TO UNDERSTANDING IRON REGULATION

October 2010

(This form may be photocopied; it is no longer valid for CEUs after April 30, 2012.)

Circles must be filled in, or test will not be graded.

Shade circles like this:  Not like this:

P=Poor; E=Excellent

1. To what extent did the article focus on or clarify the objectives?

P ① ② ③ ④ ⑤ E

2. To what extent was the article well-organized and readable?

P ① ② ③ ④ ⑤ E

3. How will you use the CE units?

- state license  
 recertification  
 employment  
 other

A B C D

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

In order to receive CE licensure credits for Florida, your license number is required. Please provide your Florida license number in the space below:

FL Lic. No. \_\_\_\_\_

**FEE FOR THIS CE TEST IS \$20.**

Make check payable to:  
**Northern Illinois University**  
Fee not refundable or transferable.

Send your check with this form to:  
University Outreach Services  
Northern Illinois University  
DeKalb, IL 60115-2860  
Telephone: 815-753-0031

**PRINT CLEARLY**

NAME \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

HOME  WORK

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

INSTITUTION/FACILITY \_\_\_\_\_

WORK PHONE \_\_\_\_\_

E-MAIL ADDRESS \_\_\_\_\_

MLO's Continuing Education Test is online also.

Both the CE test and a convenient payment feature are available through the auspices of Northern Illinois University.

Go to [www.mlo-online.com/CE.aspx](http://www.mlo-online.com/CE.aspx) to print or to send electronically with payment.