



Research

Open Access

 Nutrition Journal  
Volume 1

Viewing options:

- [Abstract](#)
- [Full text](#)
- [PDF \(290KB\)](#)

Associated material:

- [Readers' comments](#)
- [Pre-publication history](#)
- [PubMed record](#)


Related literature:

- [Articles citing this article on BioMed Central on Google Scholar on PubMed Central](#)
- [Other articles by authors](#)
  - ⊖ [on Google Scholar](#)  
Gao R  
Stone WL  
Huang T  
Papas AM  
Qui M
  - ⊖ [on PubMed](#)  
Gao R  
Stone WL  
Huang T  
Papas AM  
Qui M
- [Related articles/pages on Google on Google Scholar on PubMed](#)






Tools:

- [Download references](#)
- [Download XML](#)
- [Email to a friend](#)
- [Order reprints](#)
- [Post a comment](#)
- [Sign up for article alerts](#)

Post to:

-  [Citeulike](#)
-  [Connotea](#)
-  [Del.icio.us](#)
-  [Digg](#)
-  [Facebook](#)

# The uptake of tocopherols by RAW 264.7 macrophages

 Rong Gao<sup>1</sup> , William L Stone<sup>2</sup> , Thomas Huang<sup>1</sup> , Andreas M Papas<sup>3</sup>  and Min Qui<sup>2</sup> 

<sup>1</sup> Department of Chemistry, East Tennessee State University, Johnson City, Tennessee, 37614-0695, USA

<sup>2</sup> Department of Pediatrics, East Tennessee State University, Johnson City, Tennessee, 37614-0578, USA

<sup>3</sup> Health and Nutrition, Eastman Chemical Company, Kingsport, TN 37662, USA

 author email     corresponding author email

*Nutrition Journal* 2002, 1:2    doi:10.1186/1475-2891-1-2

Published: 15 October 2002

## Abstract

### Background

Alpha-Tocopherol and gamma-tocopherol are the two major forms of vitamin E in human plasma and the primary lipid soluble antioxidants. The dietary intake of gamma-tocopherol is generally higher than that of alpha-tocopherol. However, alpha-tocopherol plasma levels are about four fold higher than those of gamma-tocopherol. Among other factors, a preferential cellular uptake of gamma-tocopherol over alpha-tocopherol could contribute to the observed higher plasma alpha-tocopherol levels. In this investigation, we studied the uptake and depletion of both alpha-tocopherol and gamma-tocopherol (separately and together) in cultured RAW 264.7 macrophages. Similar studies were performed with alpha-tocopheryl quinone and gamma-tocopheryl quinone, which are oxidation products of tocopherols.

### Results

RAW 264.7 macrophages showed a greater uptake of gamma-tocopherol compared to alpha-tocopherol (with uptake being defined as the net difference between tocopherol transported into the cells and loss due to catabolism and/or *in vitro* oxidation).

Surprisingly, we also found that the presence of gamma-tocopherol promoted the cellular uptake of alpha-tocopherol. Mass balance considerations suggest that products other than quinone were formed during the incubation of tocopherols with macrophages.

### Conclusion

Our data suggests that gamma-tocopherol could play a significant role in modulating intracellular antioxidant defence mechanisms. Moreover, we found the presence of gamma-tocopherol dramatically influenced the cellular accumulation of alpha-tocopherol, i.e., gamma-tocopherol promoted the accumulation of alpha-tocopherol. If these results could be extrapolated to *in vivo* conditions they suggest that gamma-tocopherol is selectively taken up by cells and removed from plasma more rapidly than alpha-tocopherol. This could, in part, contribute to the selective maintenance of alpha-



maximize the visibility  
of your research

Submit your paper now - [Click here!](#)



Published by

The Open Access Publisher