



## β-CAROTENE / LYCOPENE

### DETERMINATION OF β-CAROTENE AND LYCOPENE BY HPLC-UV IN SERUM OR PLASMA

- HPLC UV-Method
- Determination of β-Carotene and Lycopene in one run
- Use Serum or Plasma
- Runtime 6 minutes
- Wavelength 450 nm UV (lamp D2)



Products	Product no.	Quantity
<b>Complete Set</b> (contains according to product insert): <b>β-Carotene / Lycopene Reagent Set</b>	2916	50 - 70 Determinations
<b>Components:</b>		
β-Carotene / Lycopene Deproteinization Reagent	2916	1 x 20 ml
β-Carotene / Lycopene Extraction Reagent	2917	1 x 100 ml
β-Carotene / Lycopene Solvent Reagent	2918	1 x 20 ml
β-Carotene Calibration Standard	2919	1 x 2 ml
β-Carotene / Lycopene Mobile Phase Reagent	2920	1 x 500 ml
Lycopene Calibration Standard	2922	1 x 2 ml
<b>Additional:</b>		
β-Carotene / Lycopene Control Low Level	2923	1 x 1 ml
β-Carotene / Lycopene Control Normal Level	2924	1 x 1 ml
β-Carotene / Lycopene Control High Level	2925	1 x 1 ml

## SUMMARY

### CLINICAL BACKGROUND

β-Carotene is the primary precursor of Vitamin A. The principal carotenoids found in human plasma or serum are β-carotene, α-carotene and lycopene. The interest in analysis of β-carotene and lycopene grows, given that these compounds appear to possess anti-mutagenic and anti-carcinogenic properties. Tomatoes, in which the carotene is primarily lycopene, are recently associated with a protective action against cancer. Dietary intake has an inverse relationship with the development of several diseases e.g. cancer, cardiovascular disease and cataracts. High β-carotene concentrations > 1.0 μmol/l in combination with low Vitamin A concentrations < 0.4 μmol/l can be the cause of a Vitamin A deficiency.

### ASSAY PRINCIPLE

After deproteinization the sample is extracted in an organic layer which is evaporated with N<sub>2</sub> (nitrogen gas) and the residue is dissolved in a solvent reagent.

β-carotene and lycopene are determined with an isocratic HPLC system using an C-18 Chromspher Column and an UV/VIS detector measuring at 450 nm.

### SAMPLE MATERIAL

Serum or plasma can be used but should be protected from light. When not directly analyzed store at - 20 °C. Stable for at least 6 months.

### ANALYTICAL CONDITIONS

Analytical Column : C18, 100 x 3 mm (5 μm packing)  
Guard Column : R2; 10 x 2 mm  
Flow Rate : 1.3 ml/min. (approx. 50 kg/cm<sup>2</sup>)  
Detection : UV; 450 nm (lamp D2)  
Injection Volume : 20 μl  
Auto-sampler: : Use Mobile Phase Reagent (2921) for purge  
Peaks : Lycopene approx. 3.0 min  
: β-Carotene approx. 4.6 min.

It is possible to deliver a ready for use prepared column for the determination of β-Carotene & Lycopene.



## EXPECTED VALUES

$\beta$ -Carotene: 0.2 - 0.8  $\mu\text{mol/l}$   
Lycopene: 0.2 - 2.5  $\mu\text{mol/l}$

## PERFORMANCE

Linearity:  
 $\beta$ -Carotene: up to 6  $\mu\text{mol/l}$   
Lycopene: up to 5.5  $\mu\text{mol/l}$   
Within run precision:

Test	n	Mean ( $\mu\text{mol/l}$ )	S.D.	VC (%)
$\beta$ -Carotene	12	0.32	0.03	10.33
Lycopene	12	0.54	0.05	9.92

### Recovery:

$\beta$ -Carotene: added 0.3  $\mu\text{mol/l}$  91.9%  
added 0.6  $\mu\text{mol/l}$  92.0%  
added 1.2  $\mu\text{mol/l}$  106.9%  
Lycopene: added 0.275  $\mu\text{mol/l}$  86.8%  
added 0.55  $\mu\text{mol/l}$  83.0%  
added 1.10  $\mu\text{mol/l}$  70.3%

### Test recovery's in patient samples:

$\beta$ -Carotene: average 89.1%  
width 83.9 - 99.1%  
Lycopene: average 98.8%  
width 93.9 - 110.8%

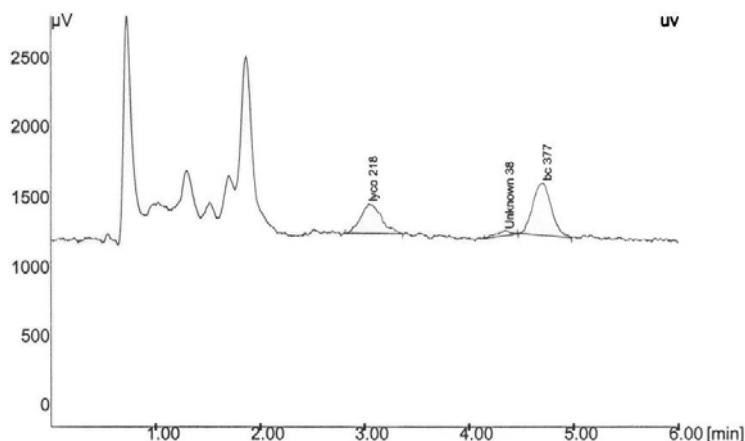
### Detection limit:

$\beta$ -Carotene: 0.04  $\mu\text{mol/l}$   
Lycopene: 0.11  $\mu\text{mol/l}$   
File name : SE01\_502.CH3

Name:	Rt	Height
Lycopene	3.04	218
B-Carotene	4.71	377

Arbitrary Patient

Injection Volume = 20  $\mu\text{l}$



## QUALITY CONTROL

Lyophilised human serum preparations with analytical results for  $\beta$ -Carotene and Lycopene by HPLC.

$\beta$ -Carotene / Lycopene Control, Low Level (human)	2923	1 x 1 ml	assayed
$\beta$ -Carotene / Lycopene Control, Normal Level (human)	2924	1 x 1 ml	assayed
$\beta$ -Carotene / Lycopene Control, High Level (human)	2925	1 x 1 ml	assayed

## NOTES

- For in vitro diagnostic use only.
- For professional use only.
- Always contact INstru<sup>®</sup>chemie for the complete product insert and latest edition.
- Printed in the Netherlands,  $\beta$ -Carotene / Lycopene-summary-280725-1.FEN