HPLC

READY TO USE DIAGNOSTIC KIT FOR HPLC

Presentation 2023

Ermes | Castiglioni | ERRECI

ERRECI LIFE SCIENCE
CHEMICAL CLINICAL AREA

- WE ARE MANUFACTURERS OF DIAGNOSTIC READY TO USE HPLC KIT
- ERRECI works in scientific instrumentation market from 1985, concerning chemical clinical area we are historical partner of BIOCHROM Ltd (part of Harvard Bioscience) with particular reference of AAA (automatic amino acids analyzer) involved in newborns screening for metabolic diseases;
- The panel kit cover determination in several area that include occupational medicine, metabolic disease, drugs monitoring, oxidative stress, vitamins profile, osteoporosis, diabetes, biogenic amines, etc. It's include technical and applicative support; Our kits are compatible with all principal brand of HPLC producer
- ERRECI can supply also OEM "open and modular" HPLC systems, our laboratories use this system to develope and test our kits, anyway our HPLC system is compatible with all analytical method and other kit available on the market.
- You can obtain more details on www.erreci-tech.com

APPLICATION AREAS

- DIABETES & THALASSEMIA
- METABOLIC DISEASE
- BIOGENIC AMINES
- DRUGS MONITORING
- OSTEOPOROSIS
- BIO MONITORING
- OCCUPATIONAL MEDICINE
- VITAMIN PROFILING

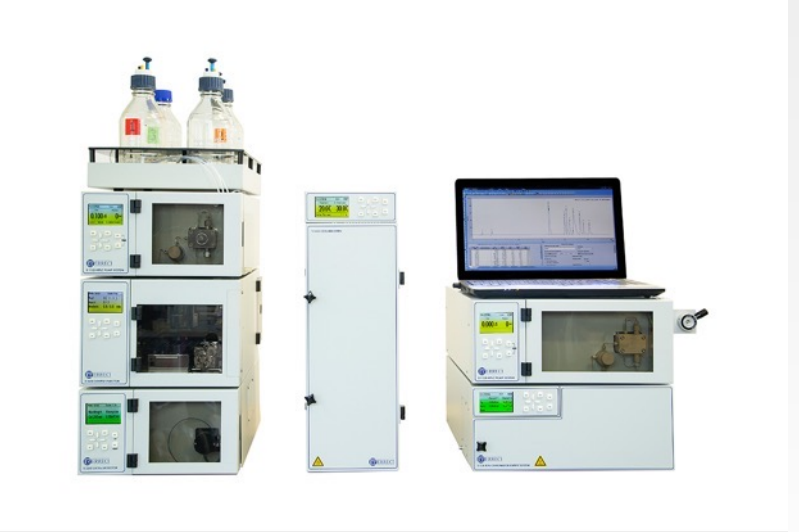
ANALITYCAL TECHNIQUES

- Liquid Chromatography(HPLC); Isocratic and Gradient (Made in Germania)
- Detector UV/VIS, DAD, Spectrofluorimetric, Amperometric, Refractive Index, Conductimeter
- Automatic sample preparation is available with specific instruments for HPLC, to allow more productivity and simplify works for users, it's more safety and reduce potential errors of manual preparation

SPECIAL FEATURES

- CE mark kits with mobile phase, internal standard, calibrator; when necessary: derivatizing, deproteinizing, wash solution, SPE and all is necessary to performs 100/200/500 Tests (depending on kit)
- Colum Oven with deviation valve to allow automatic selection of properly column to any analytical parameter
- Working flow particular low, typical from 0.6 to 0.7 l/min. Low consumption of eluents to reduce cost of analysis and disposal od solvents
- High resolution analytical column, FAST option
- Simply rapid method
- Available sample preparation instrument to optimize pre-analytical treatment
- Amperometric and electrochemical detector aren't necessary (available on request)

ONE COMPANY FOR HPLC AND DIAGNOSTIC KIT



- Isocratic or Gradient HPLC systems (LPG o HPG)
- Autosampler Option with or without thermostatation
- Automatic column oven with selection valve to choice automatically columns for every analytical parameters
- Detectors; UV/VIS, DAD, Fluorescence, Refraction Index
- Amperometric and/or Coulmeter Detector are not necessary but available on request

KIT ACTUALLY AVAILABLE

CODE	Method	DESCRIPTION	Test
RC-HPB-K00500	UV/Vis	Pathological hemoglobin variants in blood samples	500
RC-EGB-K00500	UV/Vis	Glycated Hemoglobin in blood samples	500
RC-5HU-K00100	FL	5-HIAA 5-hydroxyindoleacetic acid in urine samples	100
RC-VMU-K00100	FL	VMA (vanillylmandelic acid) in urine samples	100
RC-TRU-K00100	FL	(VMA/5-HIAA/HVA) Vanillylmandelic acid (VMA), 5-hydroxyindoleacetic acid (5-HIAA), Homovanillic acid (HVA) in urine sample	100
RC-SEU-K00100	FL	Serotonin in urine samples	100
RC-SES-K00100	FL	Serotonin in serum samples	100
RC-CAU-K00100	FL	Catecholamines in urine samples	100
RC-MNU-K00100	FL	Metanephrine in urine samples	100
RC-CSU-K00100	FL	Pyd, Dpd Crosslinks in urine samples	100
RC-ISU-K00100	FL	Hydroxyproline in urine samples	100
RC-D3P-K00100	UV/Vis	25-hydroxyvitamin D3 and vitamin D2 in plasma samples	100

KIT ACTUALLY AVAILABLE

CODE	Method	DESCRIPTION	Test
RC-AEP-K00100	UV/Vis	AED (Antiepileptic Drugs) in plasma samples or serum Lamotrigine, ethosuximide, primidone, sultiam, 10-hidrosis carbamazepine, phenobarbital, epoxide carbamazepine, oxcarbazepine, carbamazepine and diphenylhydantoin (phenytoin)	100
RC-AE2-K00100	UV/Vis	New AED (epilepsy prevention drugs) in plasma or serum samples. IS, zonisamide, lacosamide felbamate, rufinamide	100
RC-LZP-K00100	UV/Vis	LEVETIRACETAM in plasma or serum samples	100
RC-AMP-K00100	UV/Vis	Amiodarone in plasma or serum	100
RC-VPP-K00100	UV/Vis	Valproic acid in plasma samples	100
RC-OMP-0200	FL	Homocysteine in serum or plasma samples	100
RC-COU-K00100	UV/Vis	Oxalates (oxalic acid) and citrates (citric acid) in urine	100
RC-CTU-K00100	UV/Vis	Citrates (citric acid) in urine	100
RC-PTB-K00100	FL	Pterins from Blood spot and urine	100

KIT ACTUALLY AVAILABLE

CODE	Method	DESCRIPTION	Test
RC-TMU-K00100	UV/Vis	Acid T, T muconic acid in urine samples	100
RC-IPP-K00100	UV/Vis	Hippuric acid and methyl-hippuric, mandelic acid and phenyl glyoxylic acid in urine samples	100
RC-FCU-K00100	FL	Phenol, o-cresol, p-cresol in urine samples	100
RC-ICU-K00100	FL	Hydroquinone in urine samples	100
RC-FMU-K00100	FL	S-Phenylmercapturic acid in urine samples	100
RC-ACU-K00100	UV/Vis	Urinary acetone	100
RC-CDT-K00100	UV/Vis	CDT (Carbohydrate Deficient Transferrin) in serum or plasma	100
RC-EDU-K00100	UV/Vis	2,5-hexanedione in the urine	100
RC-MKU-K00100	UV/Vis	Methyl ethyl ketone in urine samples	100
RC-IDU-K00100	FL	Hydroxypyrene in urine samples	100
RC-B6P-K00100	FL	Vitamin B6 in Plasma	100
RC-B1S-K00100	FL	Vitamin B1 in whole blood	100
RC-VAS-K00100	UV/Vis	Vitamin A / E in serum samples	100
RC-VTC-K00100	UV/Vis	Vitamin C in plasma samples	100
RC-SKU-K00100	FL	Skatole in Urine Specimens (Dysbiosis)	100
RC-INU-K00100	FL	Indicano (3-indoxyl potassium sulfate) Urine samples (Dysbiosis)	100

KIT ACTUALLY AVAILABLE
LC/MS

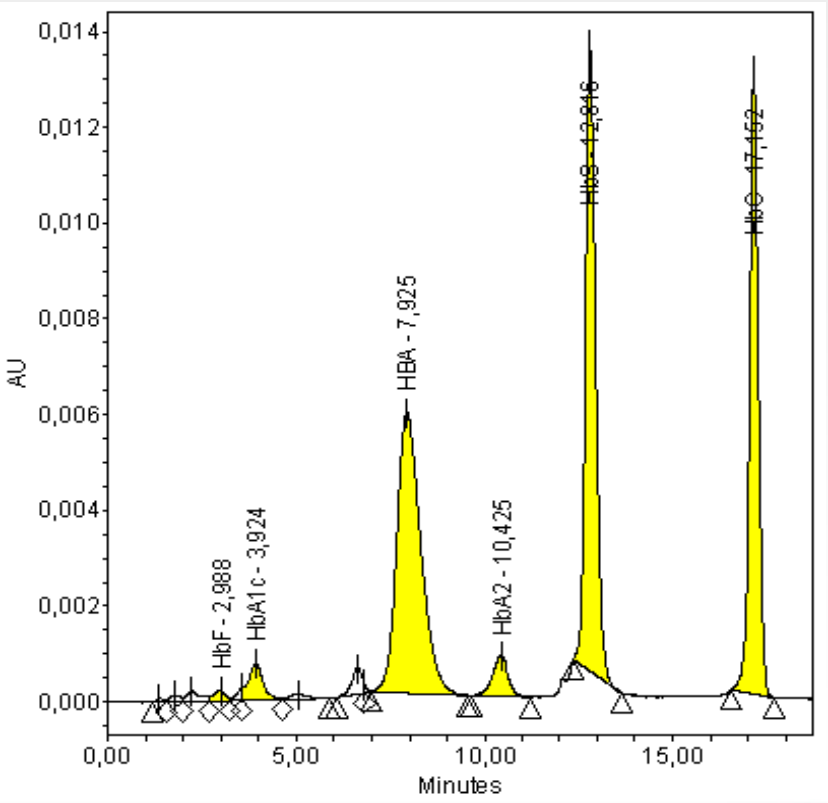
CODE	Method	DESCRIPTION	Test
RC-CGU-K00100	MS/MS	Kit pronto all'uso per LC-MS/MS relativo a Casomorfine e Gliadorfine in campioni di urine	100

CLINICAL DIAGNOSTIC

DIABETE DIAGNOSIS AND THALASSEMIA (UV/VIS)

- GLYCATED HEMOGLOBINE HbF, HbA1c
- HEMOGLOBIN VARIANTS

  HbF, HbA2, HbS, HbC,



CLINICAL DIAGNOSTIC

DIABETES AND THALASSEMIE

- GLYCATED HbA1c, HbF; Higher levels of HbA1c are found in people with persistently elevated blood sugar, as in diabetes mellitus. While diabetic patient treatment goals vary, many include a target range of HbA1c values. A diabetic person with good glucose control has an HbA1c level that is close to or within the reference range.
  The International Diabetes Federation and American College of Endocrinology recommend HbA1c values below 6.5%, while American Diabetes Association recommends that the HbA1c be below 7.0% for most patients.

- VARIANTS; Hemoglobinopathy is a kind of genetic defect that results in abnormal structure of one of the globin chains of the hemoglobin molecule. Common hemoglobinopathies include sickle-cell disease and thalassemia. Thalassemia is a quantitative problem of too few globins synthesized, whereas sickle-cell disease (a hemoglobinopathy) is a qualitative problem of synthesis of a non-functioning globin. Thalassemias usually result in under production of normal globin proteins, often through mutations in regulatory genes. Hemoglobinopathies imply structural abnormalities in the globin proteins themselves. The two conditions may overlap, however, since some conditions which cause abnormalities in globin proteins (hemoglobinopathy) also affect their production (thalassemia). Thus, some thalassemias are hemoglobinopathies, but most are not. Either or both of these conditions may cause anemia

METHABOLIC DISEASES

HOMOCYSTEINE IN PLASMA OR SERUM SAMPLES (FL)

- HIGH LEVEL OF HOMOCYSTEINE SUGGEST A POTENTIAL RISK OF CARDIOVASCULAR DISORDERS
- HIGH LEVEL OF HOMOCYSTEINE REVEAL RARE EREDITARY DISEASE WHILE HOMOCYSTINURIA
- THE LATTER IS QUITE COMMON (ABOUT 10% OF THE WORLD POPULATION) AND IT IS LINKED TO AN INCREASED INCIDENCE OF THROMBOSIS AND CARDIOVASCULAR DISEASE AND THAT OCCURS MORE OFTEN IN PEOPLE WITH ABOVE MINIMAL LEVELS OF HOMOCYSTEINE

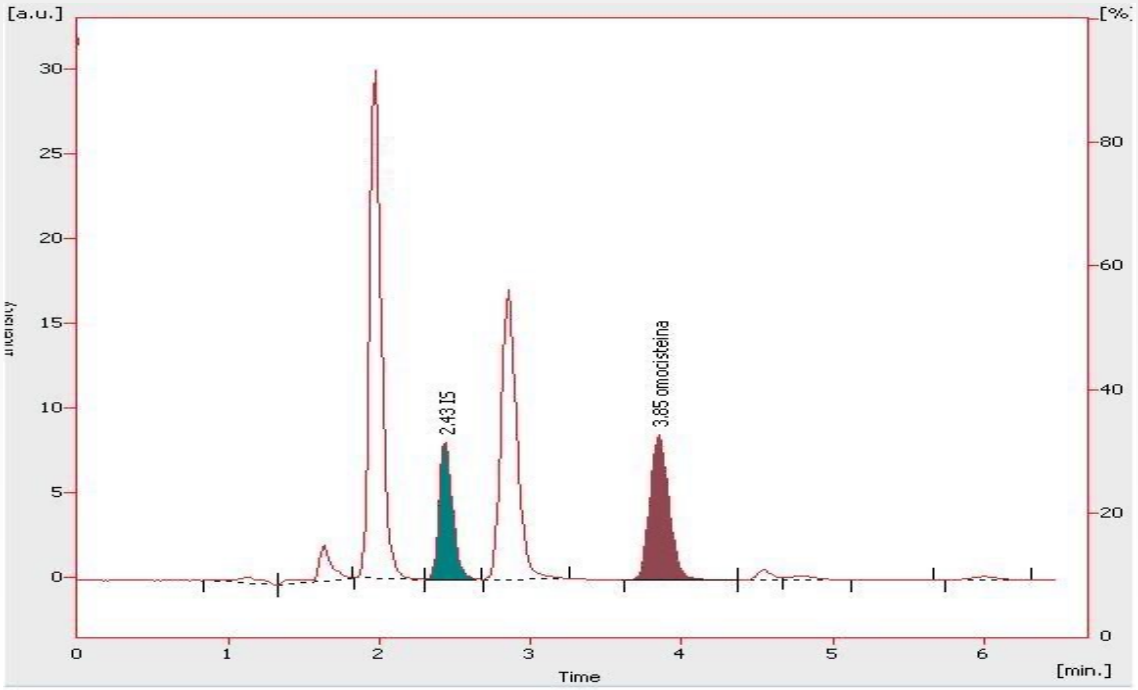
METHABOLIC DISEASES

HOMOCYSTEINE IN PLASMA OR SERUM SAMPLES (FL)

- HHcy is a sensitive marker of related vitamin deficiency (B12, B6). Furthermore, in recent years its correlation with many other physiological and pathological conditions is emerging (hypothyroidism, chronic renal failure, type 1 and 2 diabetes, neoplasms, etc.)

METHABOLIC DISEASES

HOMOCYSTEINE IN PLASMA OR SERUM SAMPLES (FL)



METHABOLIC DISEASES

CITRATE (CITRIC ACID) AND OXALATE (OXALIC ACID) IN URINE (UV/VIS)

- CITRATE: CITRATES: IT'S CONSIDERED ONE OF THE MOST INTERESTING URINARY INHIBITORS, CITRATE IS THE MAIN INHIBITOR OF FORMATION OF KIDNEY STONES. IN URINE CITRIC ACID INHIBITS THE CRYSTALLIZATION OF CALCIUM, IT DECREASES, WHEN ITS CONCENTRATION IN URINE DECREASE, COULD BE A RISK FACTOR FOR FORMATION OF KIDNEY STONES. IT'S CONSIDERED HYPOCITRATURIA, BY CONVENTION, THE URINARY EXCRETION OF CITRATE BELOW 320 MG / 24 HOURS; IT CAN BE SEPARATE OR LINKED TO OTHER METABOLIC DISEASE. THE METHOD ALLOWS TO DETERMINE THE CONCENTRATION OF CITRIC ACID (ALONG OXALIC ACID) IN URINE SAMPLES.

- A REDUCED URINARY CITRATE EXCRETION IS A RISK FACTOR FOR FORMATION OF KIDNEY STONES, IN ASSOCIATION WITH AN INCREASED OF EXCRETION OF CALCIUM, OXALATES, URATES.

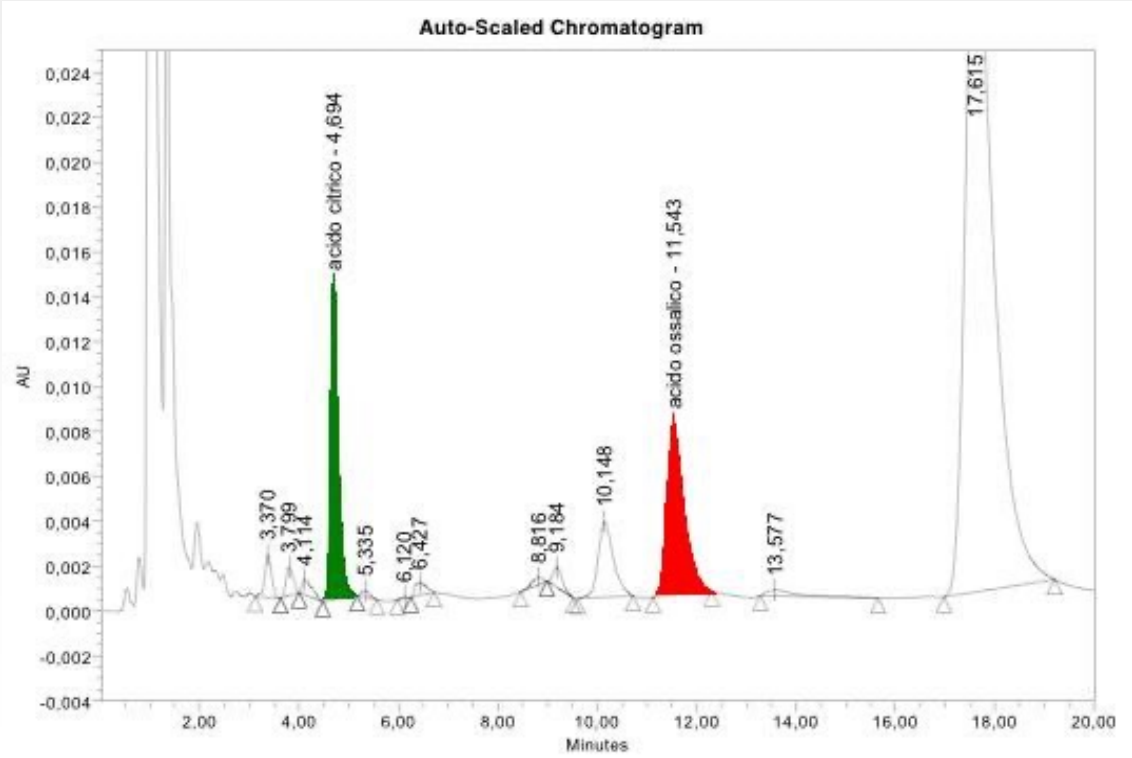
METHABOLIC DISEASES

CITRATE (CITRIC ACID) AND OXALATE (OXALIC ACID) IN URINE (UV/VIS)

- URINARY OXALATE
- SUM OF ABSORBED OXALATE + ENDOGENOUS OXALATE

- OXALATE ABSORBED
- DIET CONTENT
- DIVALENT CATIONS PRESENT IN THE INTESTINAL LUMEN
- MYCOORGANISMS
- CARRYING CAPACITY
- PATHOLOGIES (SECONDARY HYPEROXALURIA, ENTERIC)
- ASCORBIC ACID (PEOPLES AT RISK)

METHABOLIC DISEASES



BIOGENIC AMINES

- Catecholamines in urine samples
- Catecholamines in urine samples, fast method
- Catecholamines in plasma samples
- (VMA / 5-HIAA / HVA) Vanillylmandelic acid (VMA) 5-Hydroxyindoleacetic acid (5-HIAA), Homovanillic acid (HVA) in urine sample
- Vanillylmandelic acid in urine samples
- 5-Hydroxyindoleacetic acid in urine samples
- Metanephrines in urine samples
- Serotonin in urine samples
- Serotonin in serum samples

BIOGENIC AMINES
CATECHOLAMINES

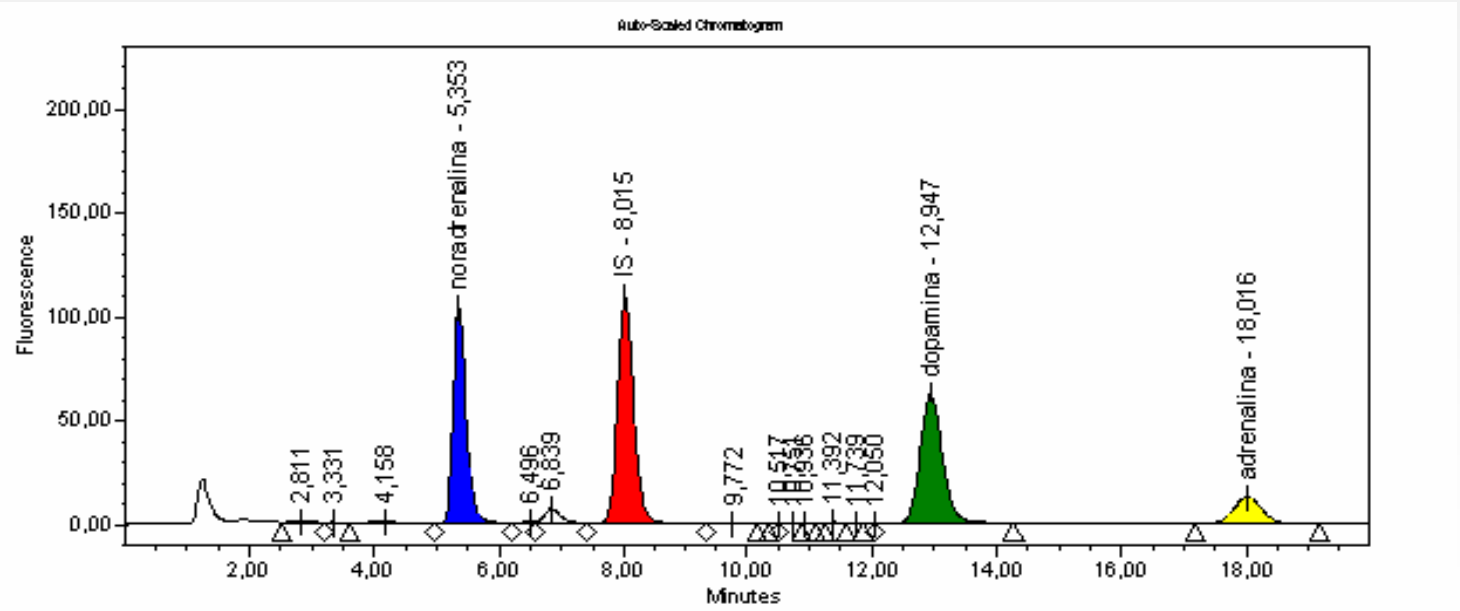
CATECHOLAMINES IN URINE SAMPLE

- Catecholamines are chemical compounds derived from the amino acid tyrosine containing catechol and amine groups. Some of them are biogenic amines. Catecholamines are water-soluble and are 50% bound to plasma proteins, so they circulate in the bloodstream. The most abundant catecholamines are epinephrine (adrenaline), norepinephrine (noradrenaline) and dopamine.

- Catecholamines (norepinephrine, epinephrine and dopamine) are important marker for the diagnosis and management of tumor diseases of the sympathoadrenal system. With the present complete kit the determination of the catecholamines is performed from urine. The Kit is characterized by an easy sample preparation with solid phase extraction. The proved kit components ensure a reliable and trouble-free analytics.

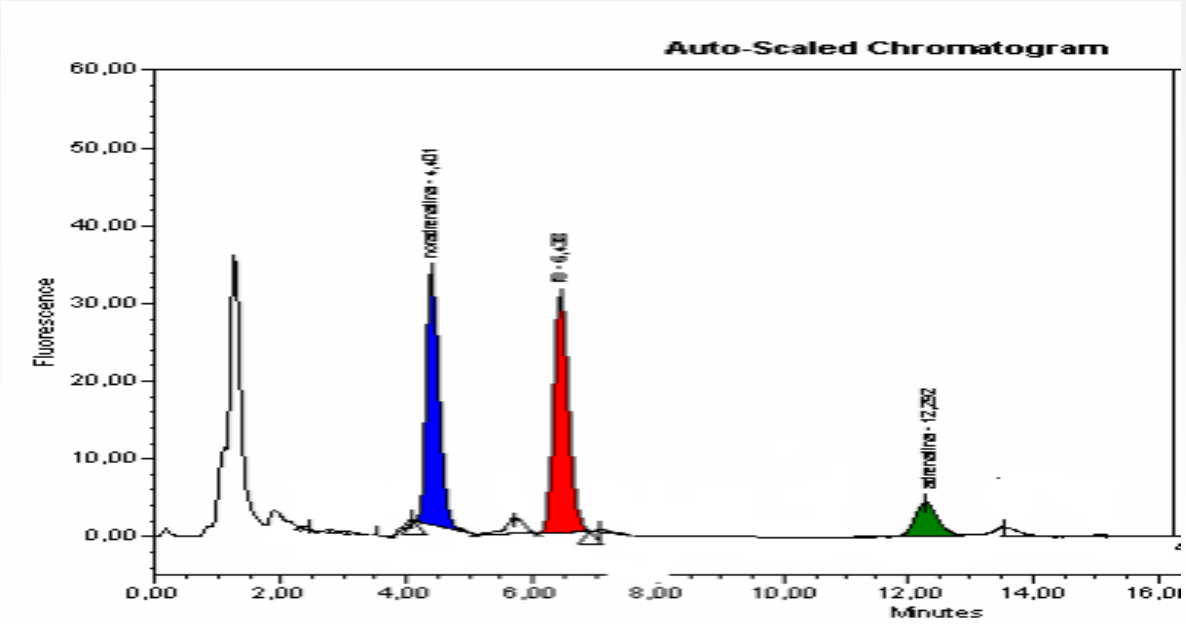
BIOGENIC AMINES
CATECHOLAMINES

CATECHOLAMINES (URINE, FL)



BIOGENIC AMINES
CATECHOLAMINES

CATECHOLAMINES (PLASMA, FL)



BIOGENIC AMINES
VMA/5-HIAA/HVA

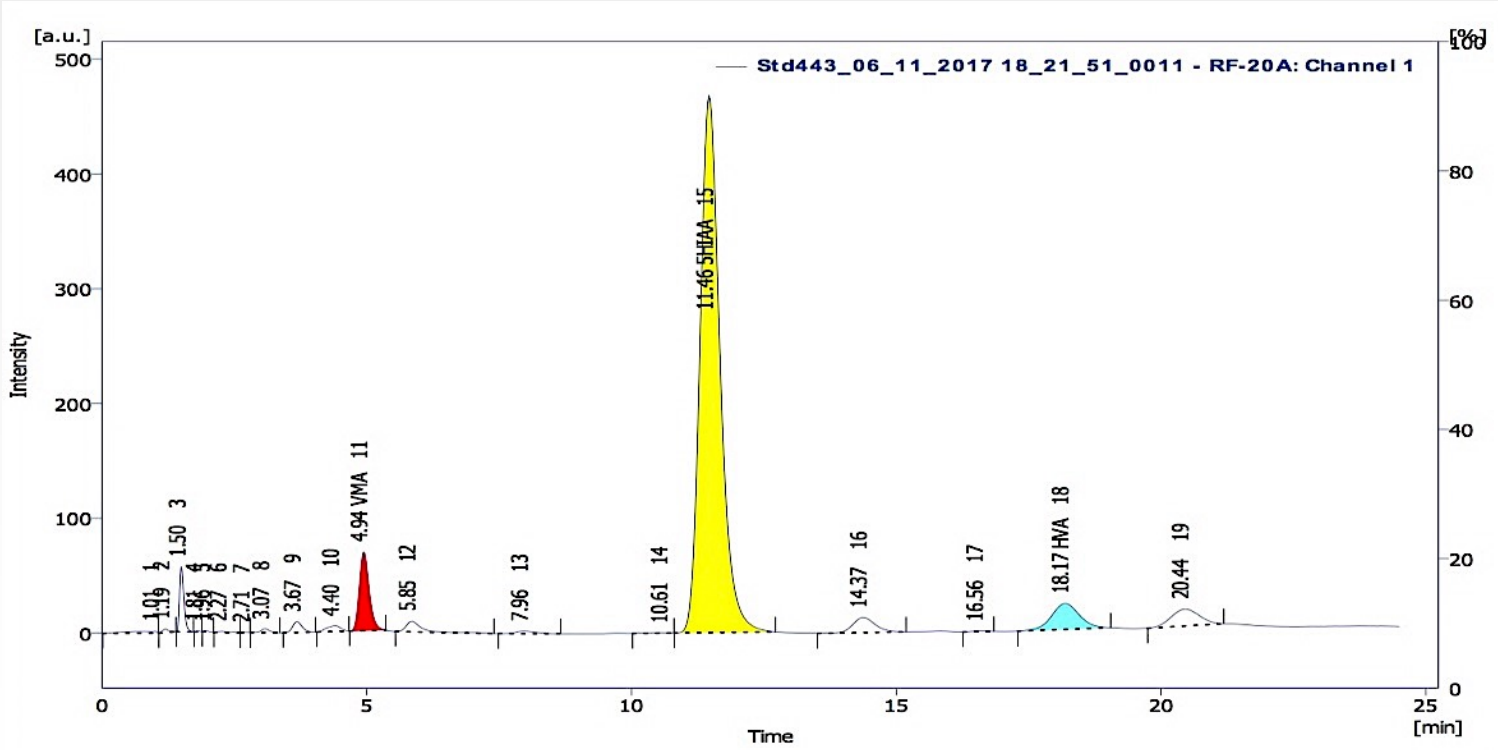
(VMA / 5-HIAA / HVA) VANILLYLMANDELIC ACID (VMA) 5-HYDROXYINDOLEACETIC ACID (5-HIAA), HOMOVANILLIC ACID (HVA) IN URINE SAMPLE (FLUORESCENCE)

VMA VANILLYLMANDELIC ACID (URINE, FL); VANILLYLMANDELIC ACID IS A FINAL METABOLITE OF NOREPINEPHRINE AND EPINEPHRINE.

5-HIIA (FL); QUANTIFICATION OF SEROTONIN (URINE) AND ITS PRINCIPAL METABOLITE, 5-HYDROXYINDOLEACETIC ACID ARE USED IN DIAGNOSIS OF CARCINOID TUMOR DISEASES

HVA HOMOVANILLIC ACID; THE MEASUREMENT OF HVA SERVES AS A SCREENING TEST FOR NEUROBLASTOMA ONE OF THE MOST COMMON SOLID TUMORS OF EARLY CHILDHOOD.

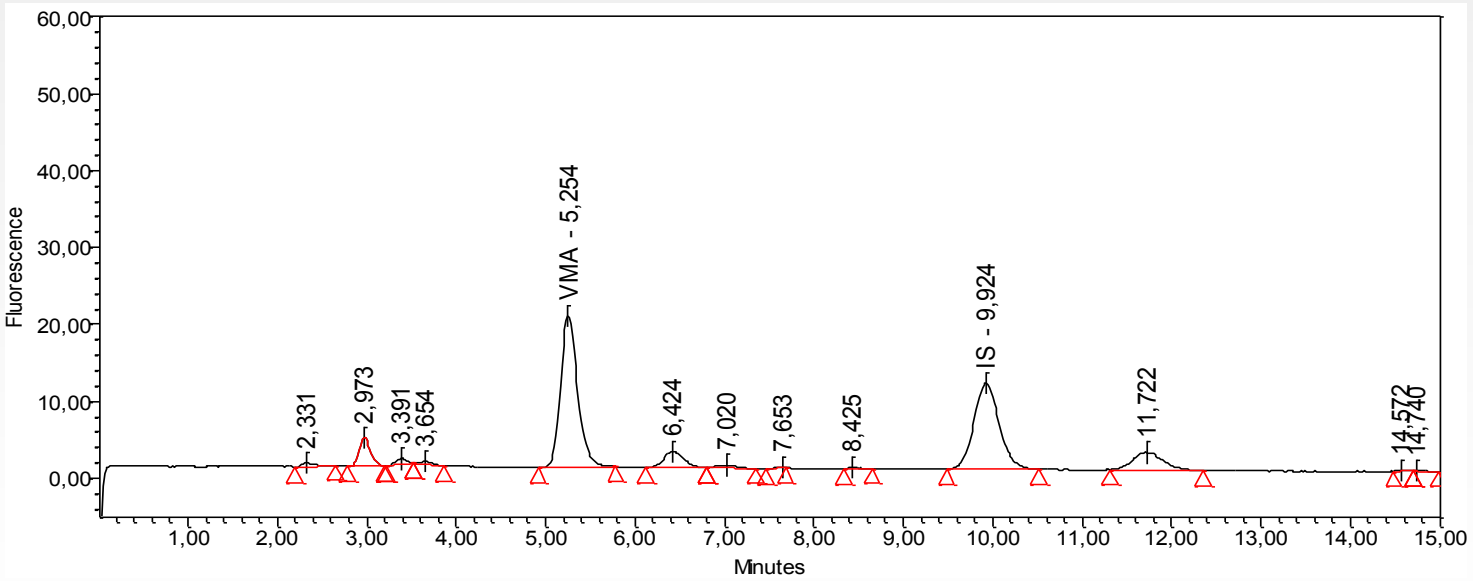
BIOGENIC AMINES
VMA/5-HIAA/HVA



BIOGENIC AMINES
VANILLYLMANDELIC ACID VMA

- **VANILLYLMANDELIC ACID VMA** (URINE, FL); is a metabolite of the catecholamine: norepinephrine. VMA is found in the urine, along with other catecholamine metabolites, including homovanillic acid (HVA). In timed urine tests the quantity (concentration µg /24 h) is assessed, along with creatinine clearance, and the concentration of cortisols, catecholamines, and metanephrines. These urinalysis tests are used to diagnose an adrenal gland tumor called pheochromocytoma, a tumor of catecholamine-secreting chromaffin cells. Norepinephrine breaks down into normetanephrine and VMA.

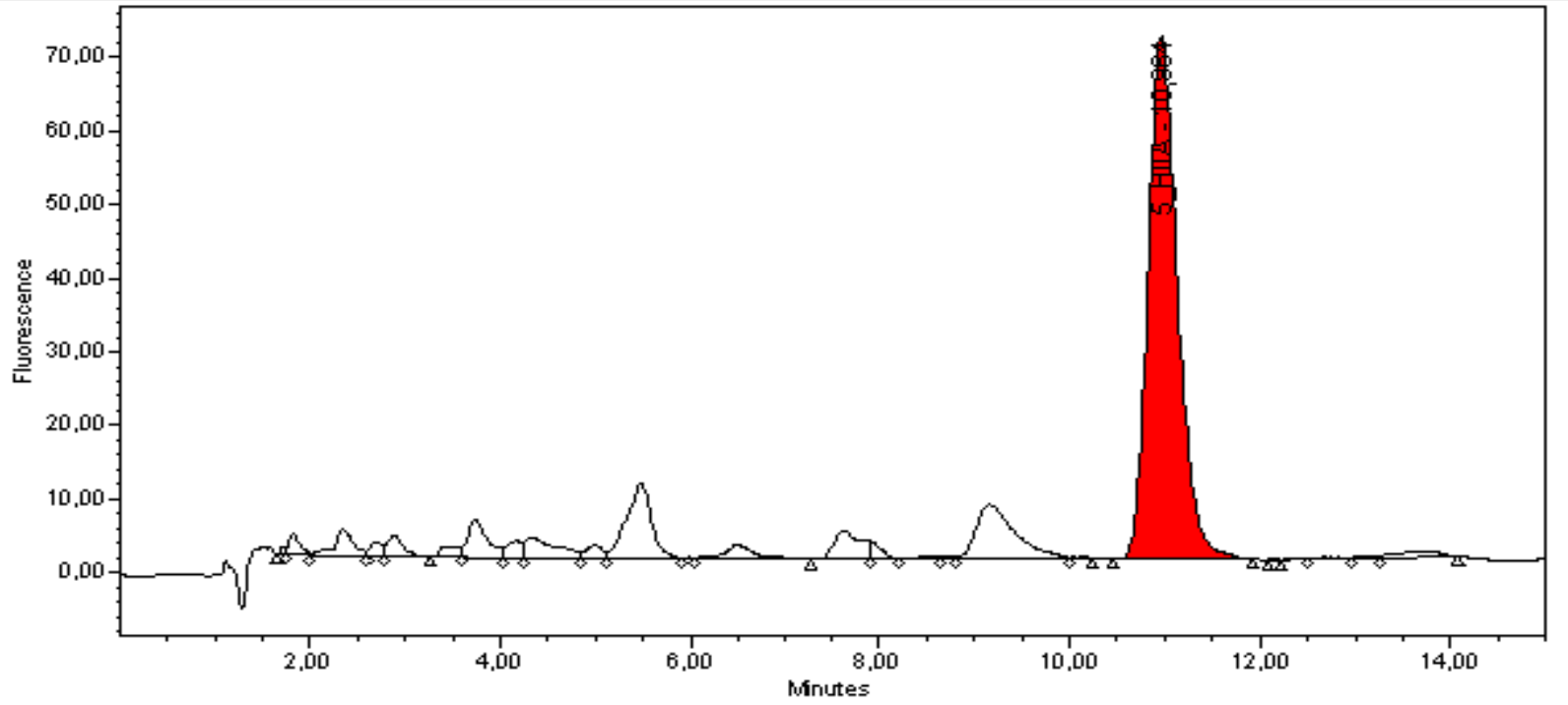
BIOGENIC AMINES
VANILLYLMANDELIC ACID VMA



BIOGENIC AMINES
5-HYDROXYINDOLEACETIC ACID 5-HIAA

- **5-HIIA (FL); Quantization of urinary 5-HIAA is the best test for carcinoid, but scrupulous care must be taken that specimen collection and patient preparation have been correct. Carcinoid tumors may cause increased excretion of tryptophan, 5-hydroxytryptophan and histamine as well as serotonin. Serum serotonin assay may detect some carcinoids missed by 5-HIAA assay. The production and metabolism of serotonin is dependent upon the tissue of origin of the tumor. Tumors from midgut cells, such as ileal carcinoid usually contain and release large quantities of serotonin. These amounts may not be fully reflected in the amount of the metabolite (5-HIAA) in urine, because little is metabolized. Tumors derived from foregut cells (bronchial, pancreatic, duodenal, or biliary carcinoid) produce large amounts of serotonin, which is oxidized within the tumor to 5-HIAA. With these tumors, urinary excretion of 5-HIAA is often much higher than would be expected from clinical presentation. Tumors derived from hindgut cells (rectal carcinoid) rarely produce excess serotonin or 5-HIAA.**

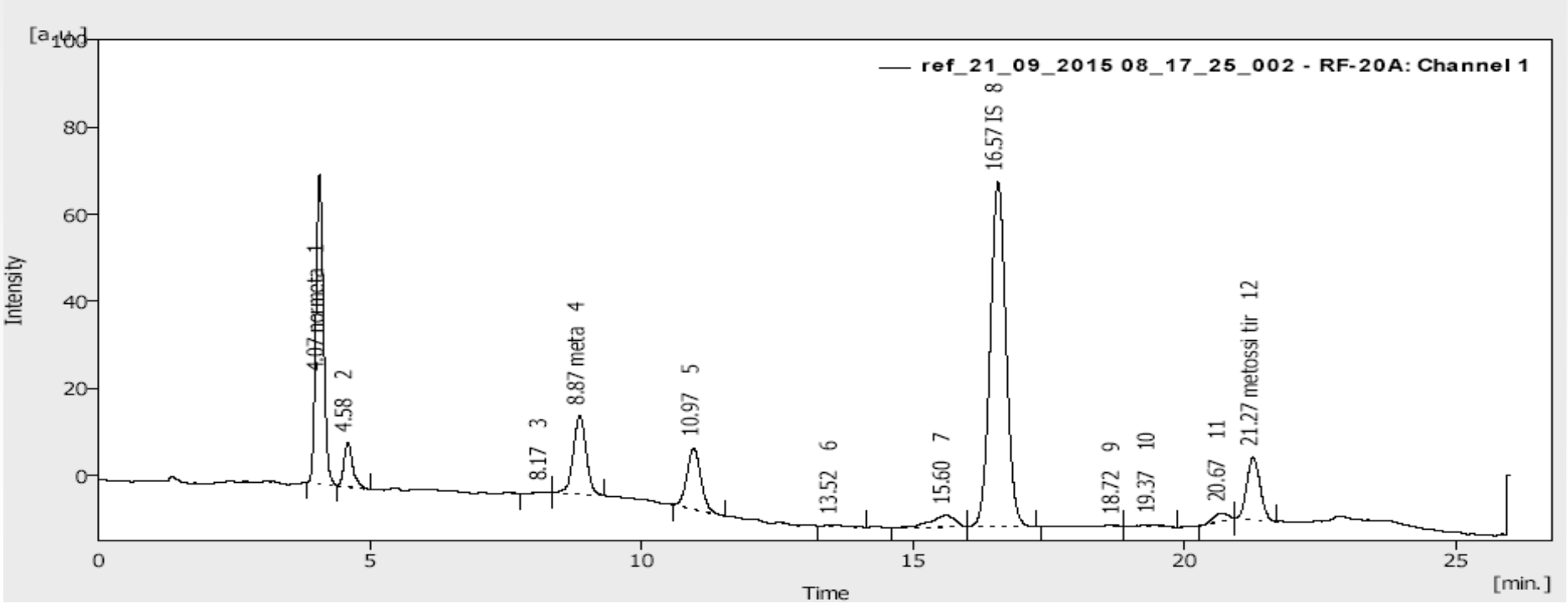
BIOGENIC AMINES
5-HYDROXYINDOLEACETIC ACID 5-HIAA



BIOGENIC AMINES
METANEPHRINES, URINE

- Metanephrine is a metabolite of epinephrine created by action of catechol-Omethyl transferase on pinephrine. With this method the fluorescence detection of the metanephrines normetanephrine, metanephrine and 3-methoxytyramine is free of interferences from tyramine, synephrine and octopamine. After incubation, the sample preparation simply requires a single sample preparation column for splitting off the conjugate.

BIOGENIC AMINES
METANEPHRINES, URINE

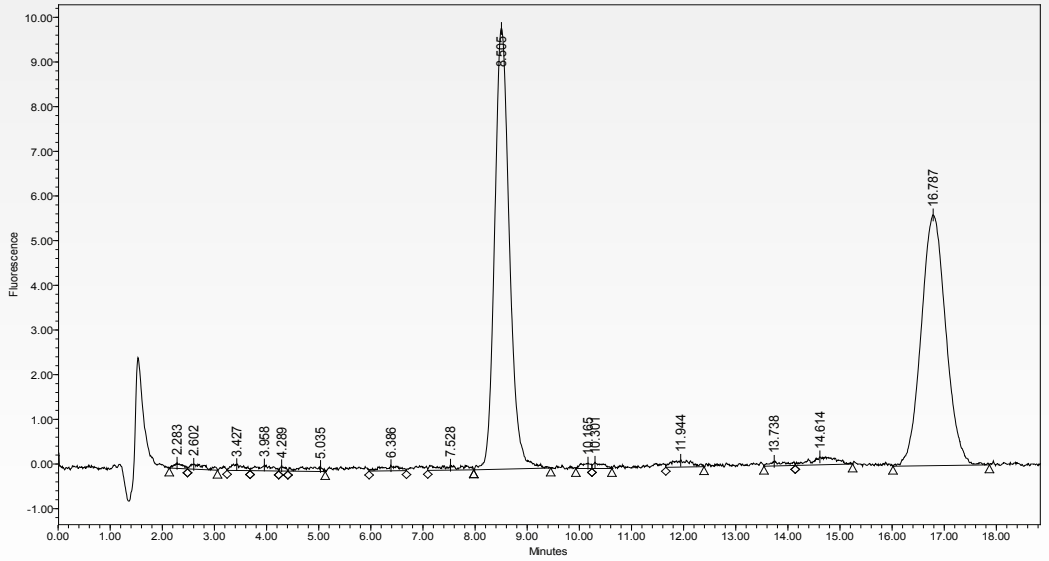


BIOGENIC AMINES
SEROTONIN, SERUM

- **SEROTONIN** (FL) is a neurotransmitter in the central nervous system. Serotonin deficiencies are connected with disorders such as depression, schizophrenia, and Parkinsons's disease. Moreover, serotonin is produced in excess by carcinoid tumors The present complete kit allows the reliable routine HPLC analysis of serotonin in serum . This kit can assist in the confirmation of, e.g., depression, schizophrenia, and carcinoid syndrome.

BIOGENIC AMINES
SEROTONIN

TRACCIATO CROMATOGRAFICO DELLO STANDARD DI TARATURA



SEROTONINA

THERAPEUTIC DRUG MONITORING

- AED (UV/VIS) Antiepileptic drugs in plasma or serum samples (8/10 Antiepileptic drugs including Lamotrigine). LAMOTRIGINE (UV/VIS) has been successfull in controlling rapid cycling and mixed bipolar states in people who have not received adequate relief from lithium, carbamazepine and/or valproate, possibly having significantly more Anti- depressant potency than either carbamazepine or valproate.

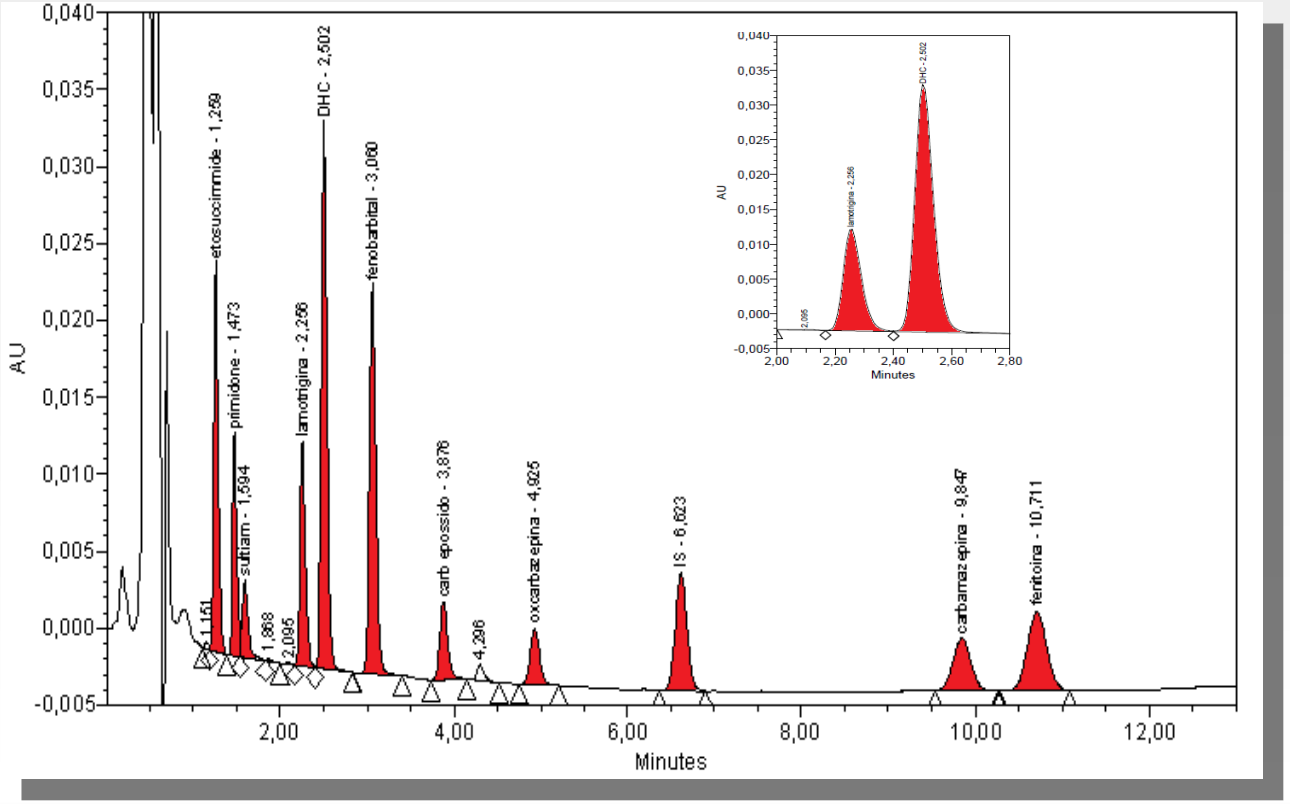
- New AED (UV/VIS) / New Antiepileptic drugs in plasma or serum samples IS, ZONISAMIDE, LACOSAMIDE FELBAMATO, RUFINAMIDE

THERAPEUTIC DRUG MONITORING

- VALPROIC ACID in plasma samples (UV/VIS)
- LEVETIRACETAM (UV/VIS) (new Antiepileptic drugs)
- AMIODARONE (UV/VIS) Amiodarone is a member of a new class of antiarrhythmic drugs with predominantly Class III (Vaughan Williams' classification) effects in plasma or serum

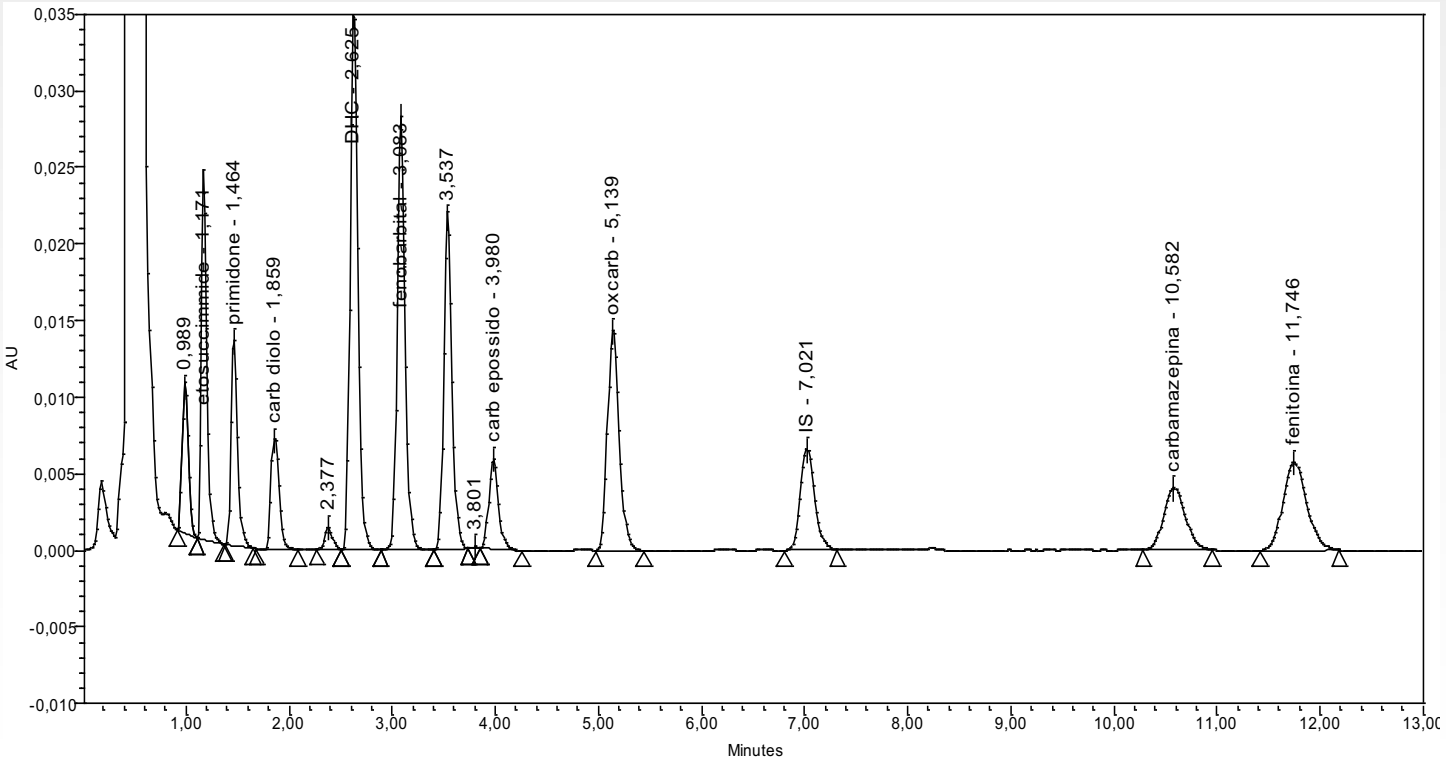
THERAPEUTIC DRUG MONITORING

AED Antiepileptic drugs (UV/VIS)



THERAPEUTIC DRUG MONITORING

AED Antiepileptic drugs (UV/VIS)



THERAPEUTIC DRUG MONITORING
AED Antiepileptic drugs (UV/VIS)

A – Profile of antiepiletic drugs with standard “ClinCal serum AED2” to dose: etosuccimmide, primidone, 10-idrossicarbamazepina, fenobarbital, oxcarazepina, carbamazepina e difenilidantoina (fenitoina).

B - Profile of antiepiletic drugs with standard “ClinCal serum AED3” AED3 to dose lamotrigine and etosuccimmide, primidone, sultiam, 10-idrossicarbamazepina, fenobarbital, carbamazepina epossido, oxcarbazepina, carbamazepina e difenilidantoina (fenitoina).

THERAPEUTIC DRUG MONITORING

AED Antiepileptic drugs (UV/VIS)

ELUITION

calibratore AED3:

Etosuccimmide

Primidone

Sultiam

Lamotrigina

10-OH carbazepina / DHC

Fenobarbital

Carbamazepina epossido

OxaCarbazepina

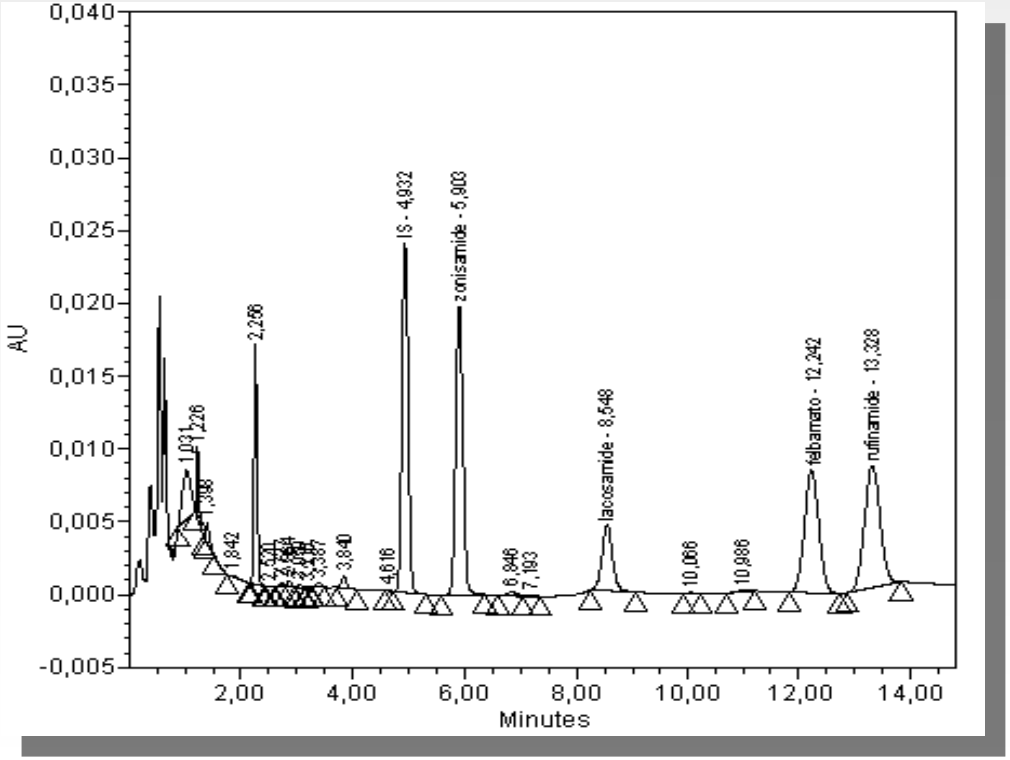
Standard Interno

Carbamazepina

Fenitoina

THERAPEUTIC DRUG MONITORING

NEW AED Antiepileptic drugs (UV/VIS)



THERAPEUTIC DRUG MONITORING

NEW AED Antiepileptic drugs (UV/VIS)

ELUITION ORDER

IS

Zonisamide

lacosamide felbamato

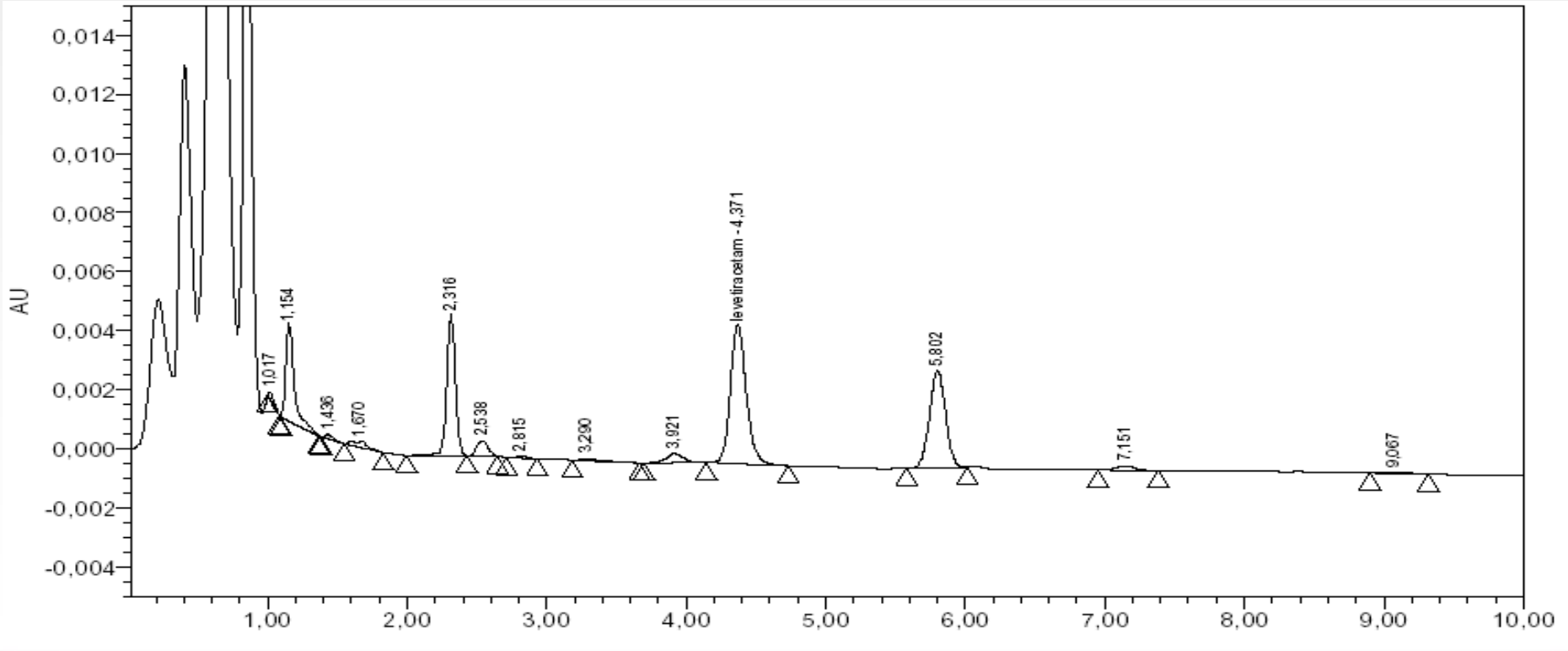
rufinamide

THERAPEUTIC DRUG MONITORING
LEVETIRACETAM (UV/VIS)

- Quickly and safety determination of Levetiracetam in serum / plasma.

- Levetiracetam is a promising new antiepileptic drug. Chemically it is unrelated to the existing antiepileptic drugs. Since there is inter-individual drug concentration variability in patients, the determination of serum levels (therapeutic drug monitoring) can be useful in patients depending on the clinical setting.

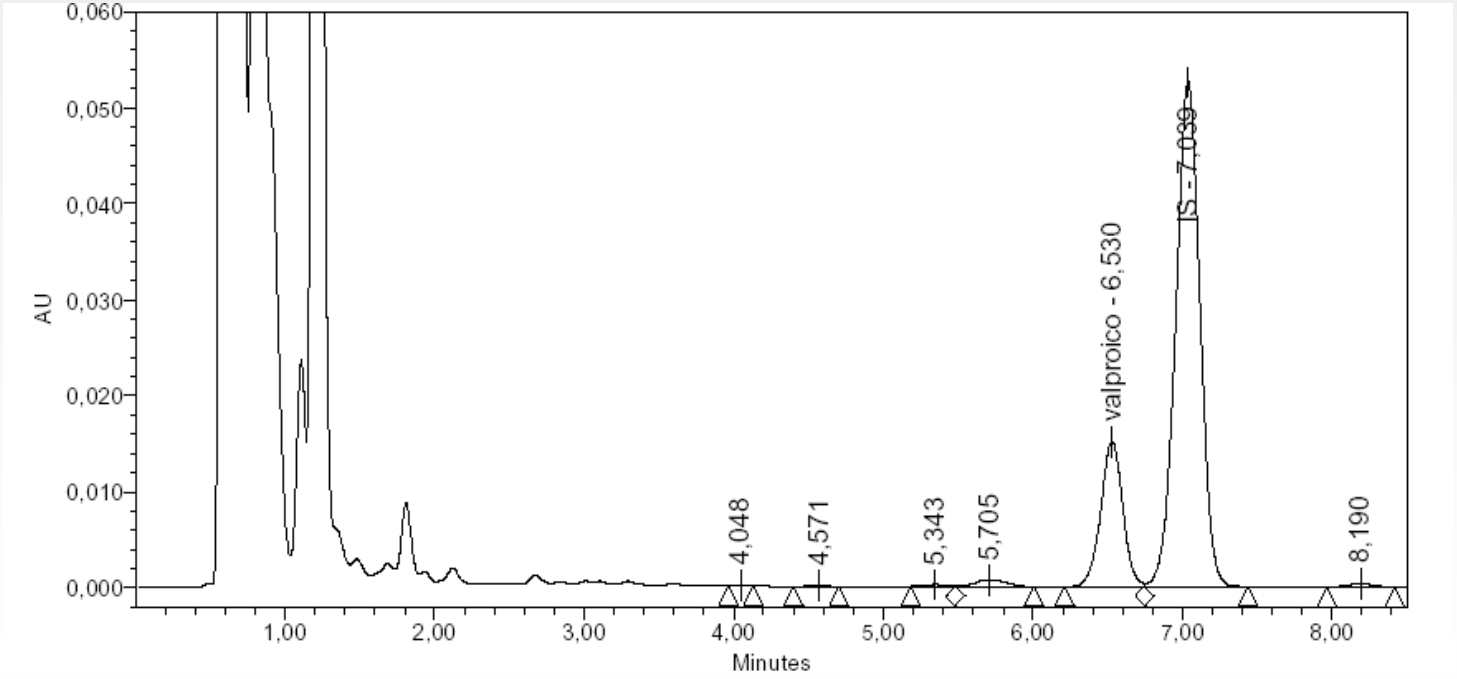
THERAPEUTIC DRUG MONITORING
LEVETIRACETAM (UV/VIS)



THERAPEUTIC DRUG MONITORING
VALPROIC ACID (UV/VIS)

- For determination of Valproic acid in plasma or serum by HPLC separation.
- Valproic acid is a carboxilic acid often used as anticonvulsant. It has a chain of 8 carbon atoms.
- Valproic acid is very effective in the treatment of epilepsy, other uses include the prophylaxis and treatment of bipolar disorders. The kit allows the determination of valproic acid in plasma or serum.

THERAPEUTIC DRUG MONITORING
VALPROIC ACID (UV/VIS)



OSTEOPOROSIS

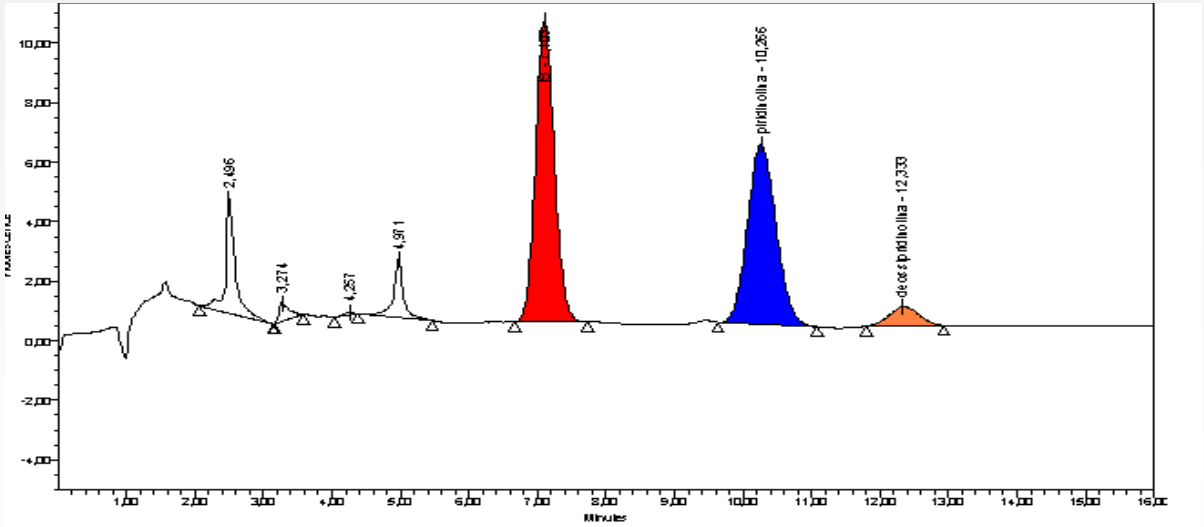
- CROSSLINKS PYD, DPD (FL) IN URINE SAMPLES, MARKER TO DIAGNOSIS OF OSTEOPOROSIS AND RHEUMATOID ARTHRITIS

- 25-HYDROXYVITAMIN D3 / D2 IN PLASMA SAMPLES (FL), Vitamin D insufficiency therefore is associated with many chronic conditions and latency diseases, a severe deficiency leads to rickets in children and osteomalacia in adults. This reagent kit allows the safe chromatographic determination of 25-OH-Vitamin D3 on a simple isocratic HPLC system with UV detection.

- HYDROXYPROLINE is an amino acid, which is an important marker in the diagnostics of osteoporosis. Proline hydroxylation requires ascorbic acid. The most obvious, first effects (gum and hair problems) of absence of ascorbic acid in humans come from the resulting defect in hydroxylation of proline residues of collagen, with reduced stability of the collagen molecule causing scurvy. After a special sample preparation, hydroxyproline can be quantified without interferences as a derivative.

OSTEOPOROSIS
CROSSLINKS PYD, DPD (FL)

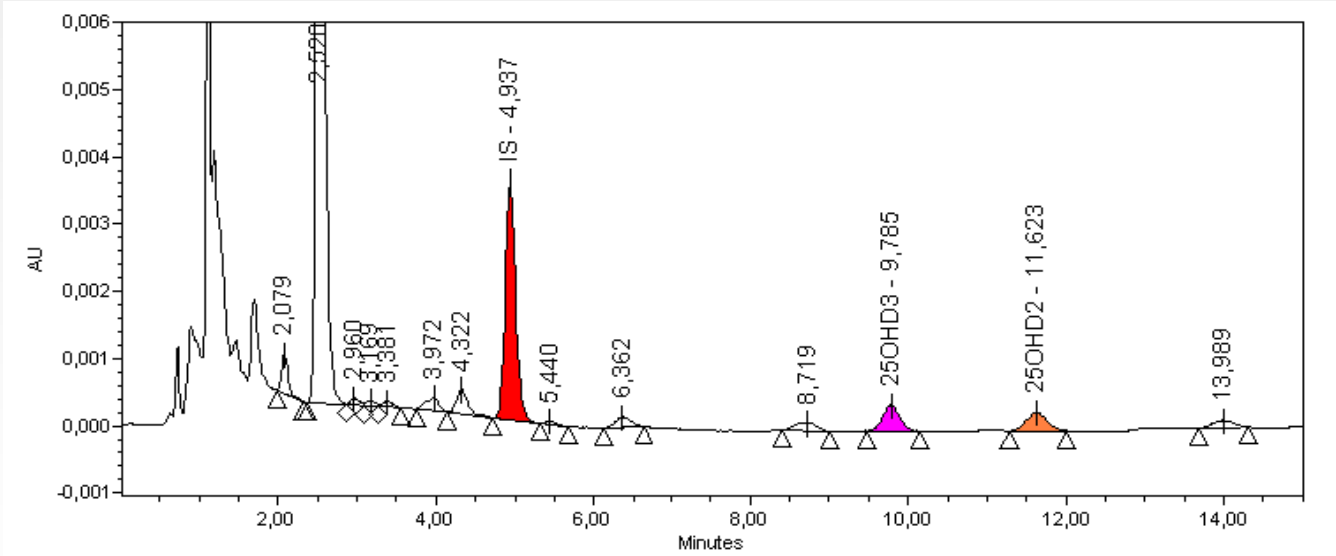
CROSSLINKS PYD, DPD (FL) IN URINE SAMPLES, MARKER TO DIAGNOSIS OF OSTEOPOROSIS AND RHEUMATOID ARTHRITIS



standard interno
piridinolina
deossipiridinolina

OSTEOPOROSIS
25-HYDROXYVITAMIN D3 / D2 IN PLASMA

standard di taratura



standard interno
25-idrossivitamina D3
25-idrossivitamina D2

OSTEOPOROSIS
25-HYDROXYVITAMIN D3 / D2 IN PLASMA

The vitamin D exists in two different forms

- **Vitamin D2** (ergocalciferol) is formed by the influence of sun - rays on its provitamin shape of herbal (ergosterol) origin
- **Vitamin D3** (colecalciferol) is formed in the skin by 7dehydrocholesterol with sun-rays

OSTEOPOROSIS
25-HYDROXYVITAMIN D3 / D2 IN PLASMA

THE CONCENTRATIONS OF 25-HYDROXYVITAMIN D3 IN PLASMA CAN BE CORRELATED AT:

- BONE PATHOLOGIES
- CARDIOVASCULAR PATHOLOGIES
- ACUTE AND CHRONIC PNEUMOPATHIES
- COGNITIVE DEFICIT
- NEOPLASIAS (CANCER)
- AUTOIMMUNE DESEASES
- PULMONARY TUBERCULOSIS

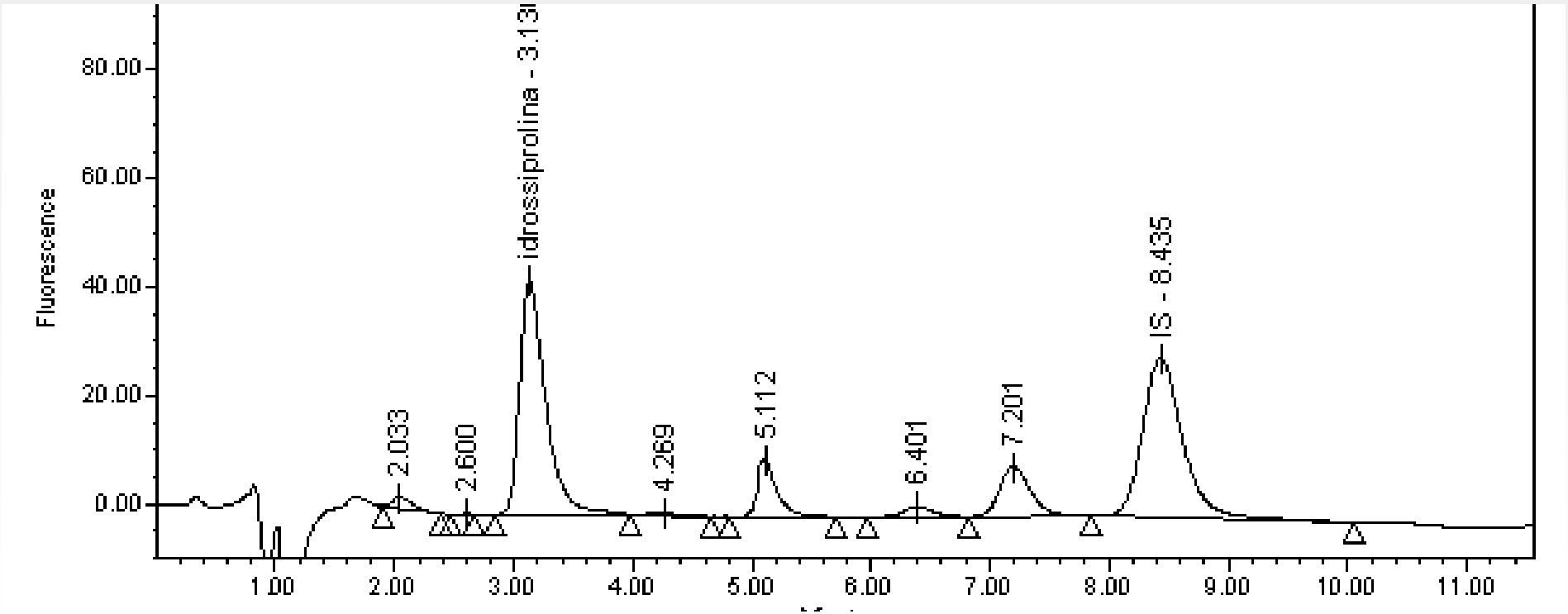
OSTEOPOROSIS
HYDROXIPROLINE (FL)

- Hydroxyproline is an amino acid content almost exclusively in collagen that is the main constituent of bone and derma. Hydroxyproline is a result of hydroxylation of proline residues, and once liberated from bone remodeling metabolic processes, it's not more reused for further biosynthetic processes.

- For this reason the dosage of expelled in the urine is considered a sensitive measure of the metabolism of collagen. In urine hydroxyproline is present for the most part as a dipeptide, tripeptide, and only in a small amount (about 3%) in the free form .

- During adolescent age, due to intense growth of bone tissue, the elimination of hydroxyproline is much higher than in adults.

OSTEOPOROSIS
HYDROXIPROLINE (FL)



BIOMONITORING
ESPOSITION
OCCUPATIONAL MEDICINE

- **T,T-MUCONIC ACID (UV/VIS)** IN URINE SAMPLES, METABOLITES FROM THE EXPOSURE TO BENZENE AND DERIVATIVES
- **HIPPURIC ACID, METHYL-HIPPURIC MANDELIC ACID AND PHENYL GLYOXYLIC ACID (UV/VIS) IN URINE SAMPLES**
- **CDT CARBOHYDRATE-DEFICIENT TRANSFERRIN (SERUM) (UV/VIS)**
- **2,5-HEXANEDIONE (UV/VIS) IN URINE**

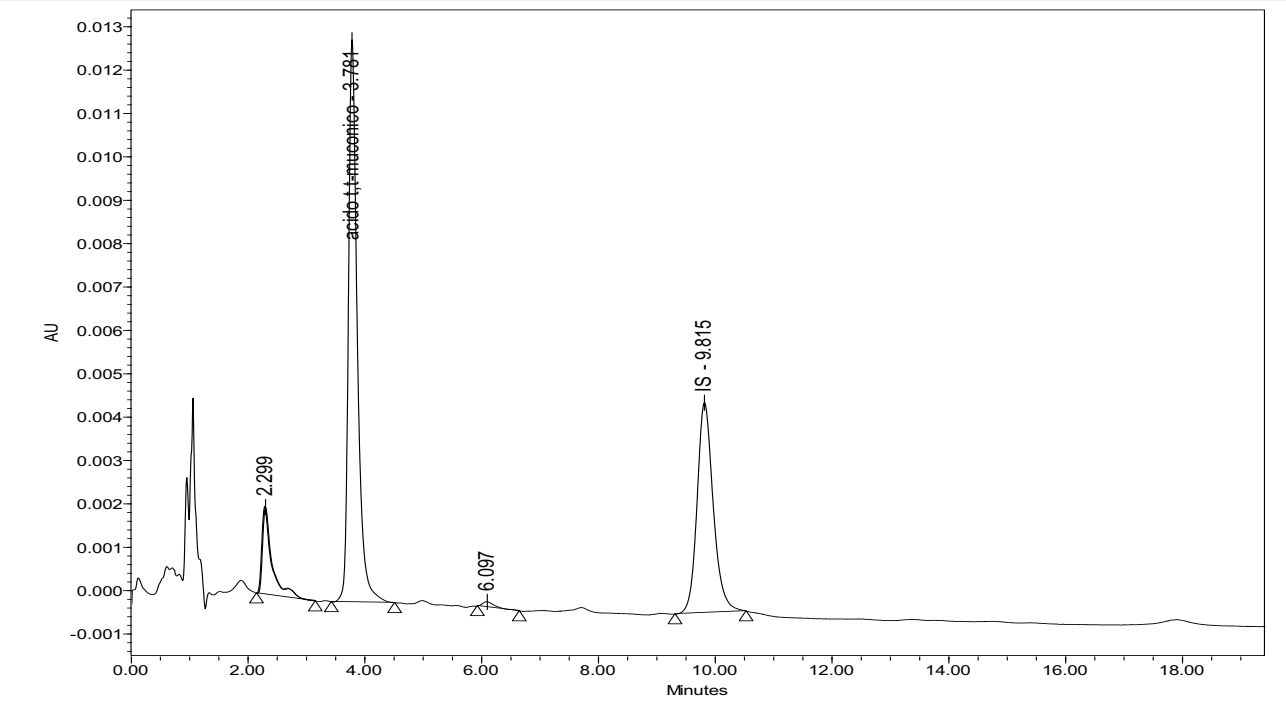
BIOMONITORING
ESPOSITION
OCCUPATIONAL MEDICINE

- **Phenols and cresols in urine (FL)**
- **Urine hydroquinone (FL)**
- **S-Phenylmercapturic acid in urine (FL)**
- **URINARY ACETONE (UV/VIS)**
- **Urine Methyl Ethyl Ketone (UV)**
- **Urine hydroxypyrene (FL)**

BIOMONITORING
T,T-MUCONIC ACID (UV)

- **T,T-Muconic acid is a minor metabolite of benzene and, in combination with phenol, is used for the assessment of an occupational benzene exposure.**
- **The Biological Exposure Index (BEI) has been set as the upper limit for concentrations of toxic substances and their metabolites in urine defining the maximum concentrations that do not normally compromise a person's health**

BIOMONITORING
T,T-MUCONIC ACID (UV)



BIOMONITORING

HIPPURIC ACID, METHYL-HIPPURIC MANDELIC ACID AND PHENYL GLYOXYLIC ACID (UV/VIS)

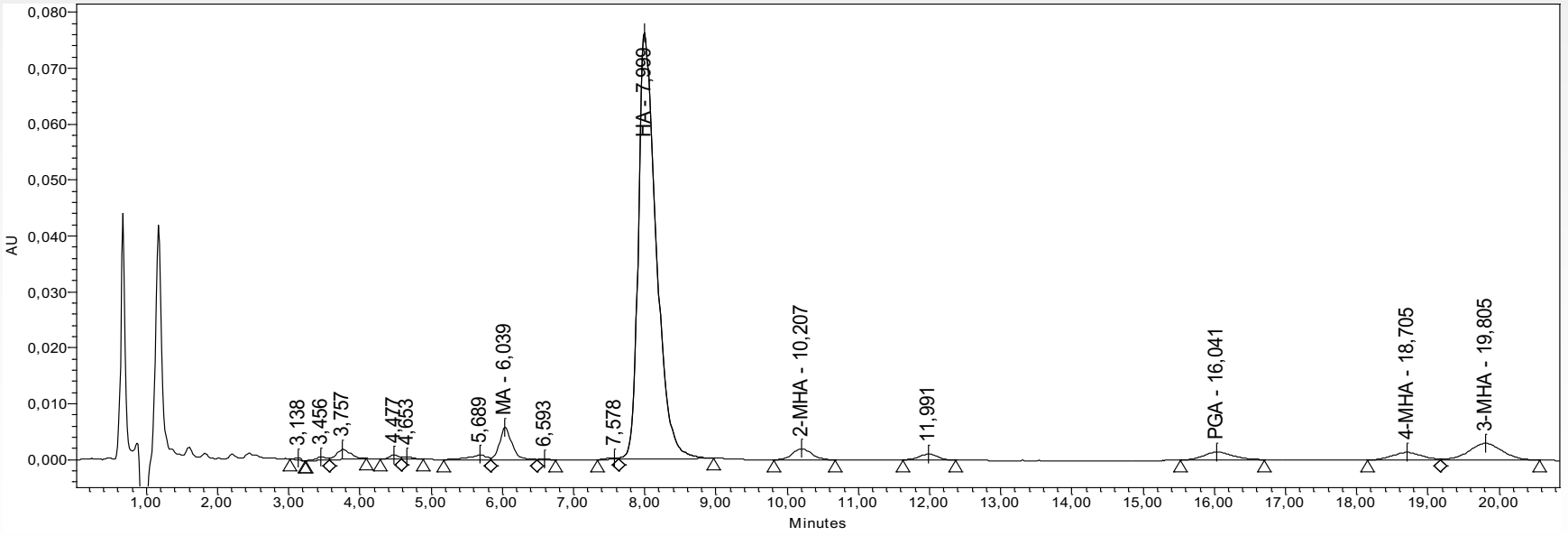
- **HIPPURIC ACID, METHYL-HIPPURIC MANDELIC ACID AND PHENYL GLYOXYLIC ACID (UV/VIS) IN URINE SAMPLES; Hippuric acid, methylhippuric acid, are the main metabolites of toluene and mixture of o-m-p,Xylene**

- **MANDELIC ACID and PHENYLGLYOXYLIC ACID are the main metabolites of styrene, MANDELIC ACID is this even as a metabolite of ethylbenzene.**

- **The Biological Exposure Index (BEI) has been set as the upper limit for concentrations of toxic substances and their metabolites in urine defining the maximum concentrations that do not normally compromise a person's health**

BIOMONITORING

HIPPURIC ACID, METHYL-HIPPURIC MANDELIC ACID AND PHENYL GLYOXYLIC ACID (UV/VIS)



BIOMONITORING

o-Cresol, p-Cresol and Phenol in urine samples

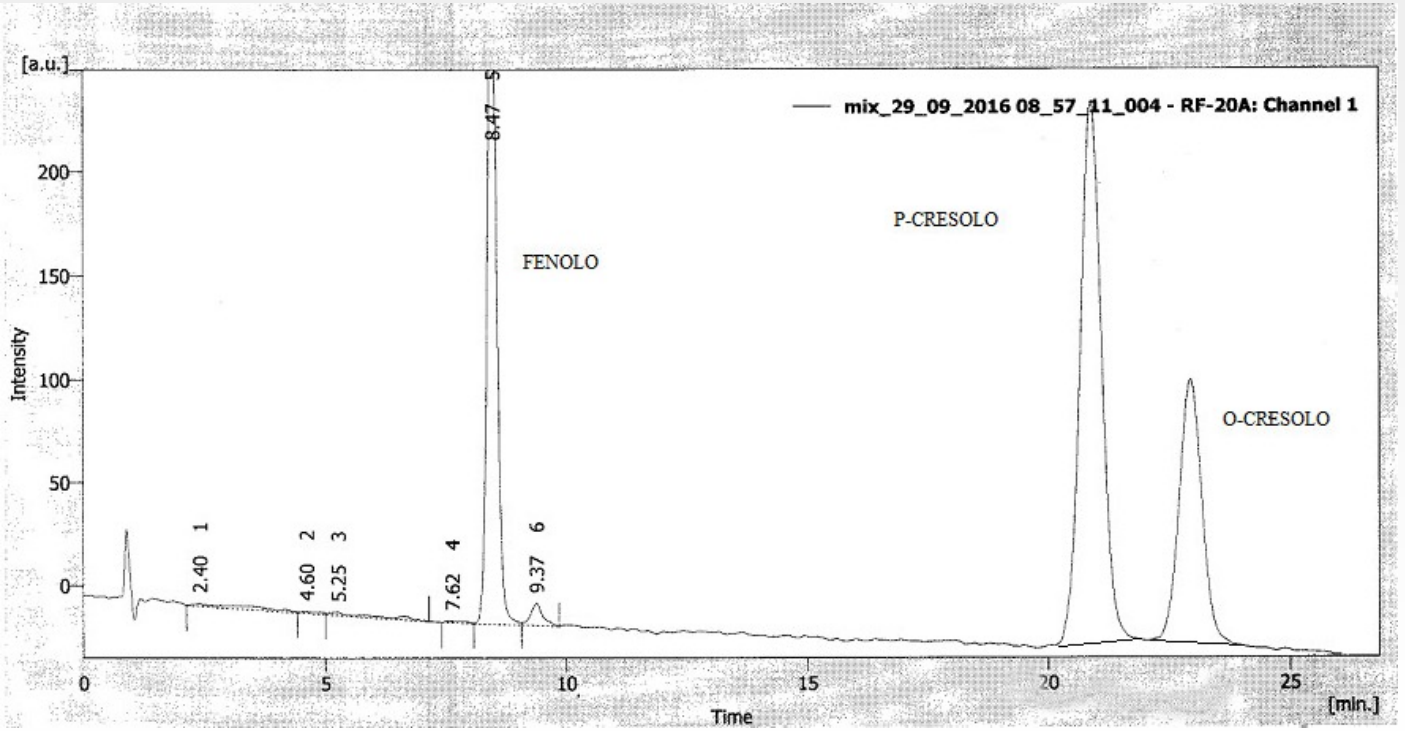
Fluorescence Method

- O-Cresol is a minor metabolite of toluene and is used to evaluate the exposure to toluene caused by glues, paints and thinners. Unlike hippuric acid, which is the major metabolite of toluene, o-cresol is not a physiological constituent of urine and therefore reflects internal exposure to the pollutant.
- Phenol is the major metabolite of benzene and is used for the evaluation of benzene and phenol itself.
- Dosage of p-cresol both in the evaluation of intestinal dysbiosis, as a marker of clostridium difficile, and in the metabolic study of the spectrum of autistic disorders

BIOMONITORING

o-Cresol, p-Cresol and Phenol in urine samples

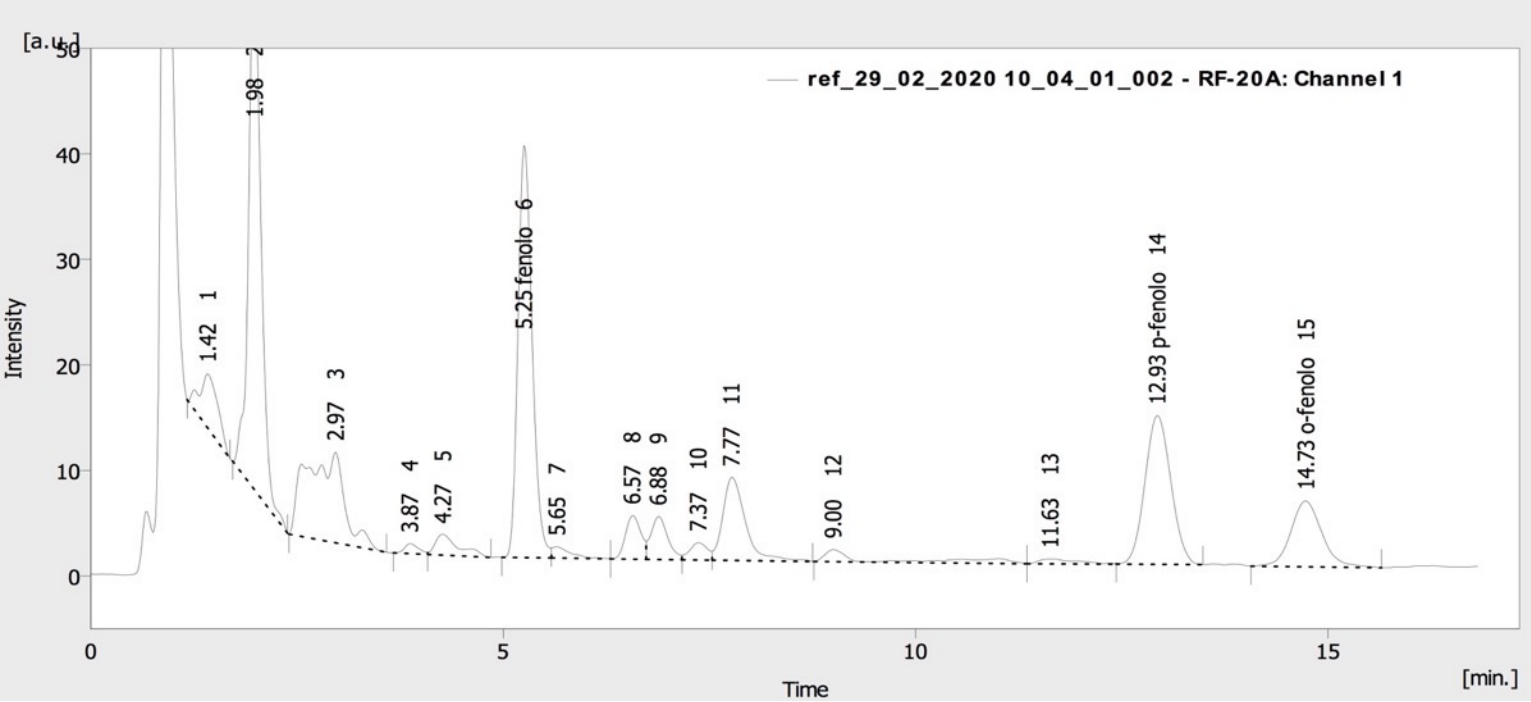
Fluorescence Method



BIOMONITORING

o-Cresol, p-Cresol and Phenol in urine samples

Fluorescence Method



BIOMONITORING

Hydroquinone in urine samples

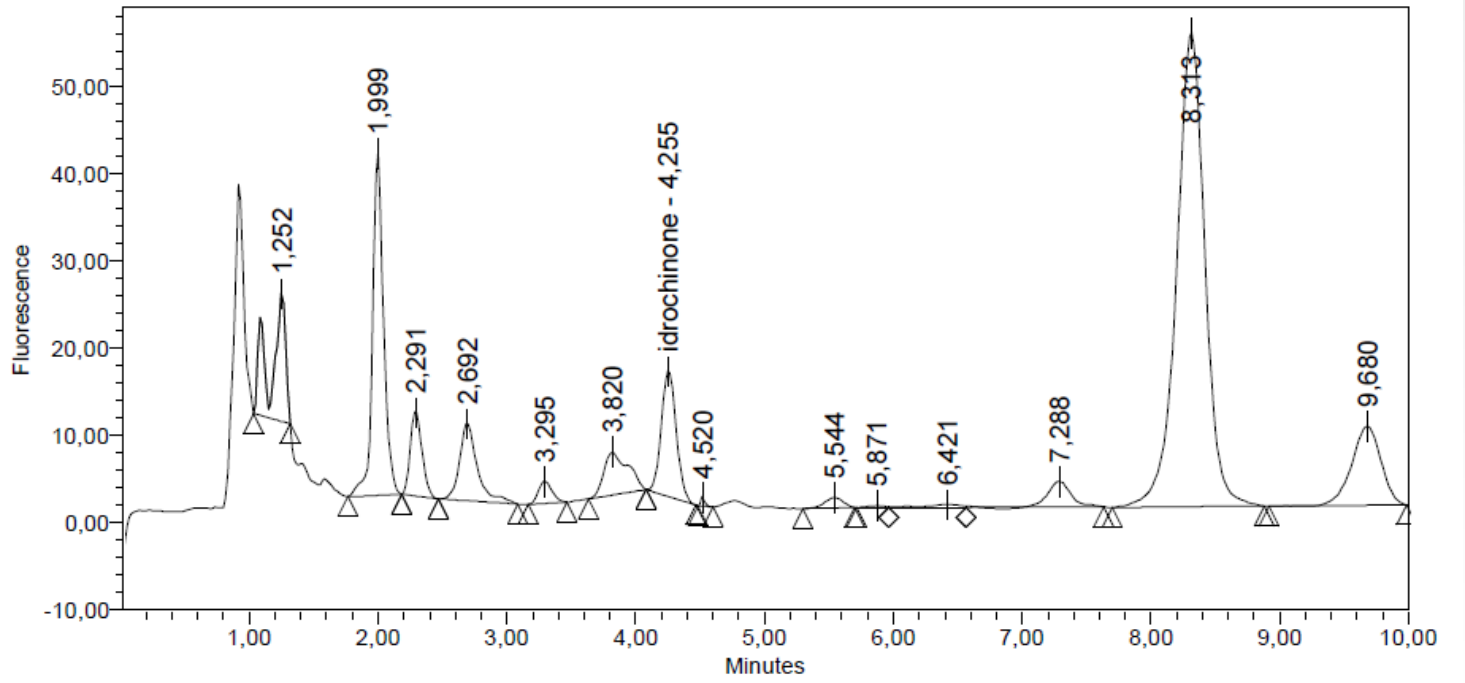
Fluorescence Method

Hydroquinone is a phenolic metabolite of benzene, a known human carcinogen. Hydroquinone is widely used in industry. Aberrations in chromosome 5 and chromosome 7 are reported and it is a potential cause of haematolymphatic tumors, the role of hydroquinone as a genotoxic and leukemogenic agent is discussed.

BIOMONITORING

Hydroquinone in urine samples

Fluorescence Method



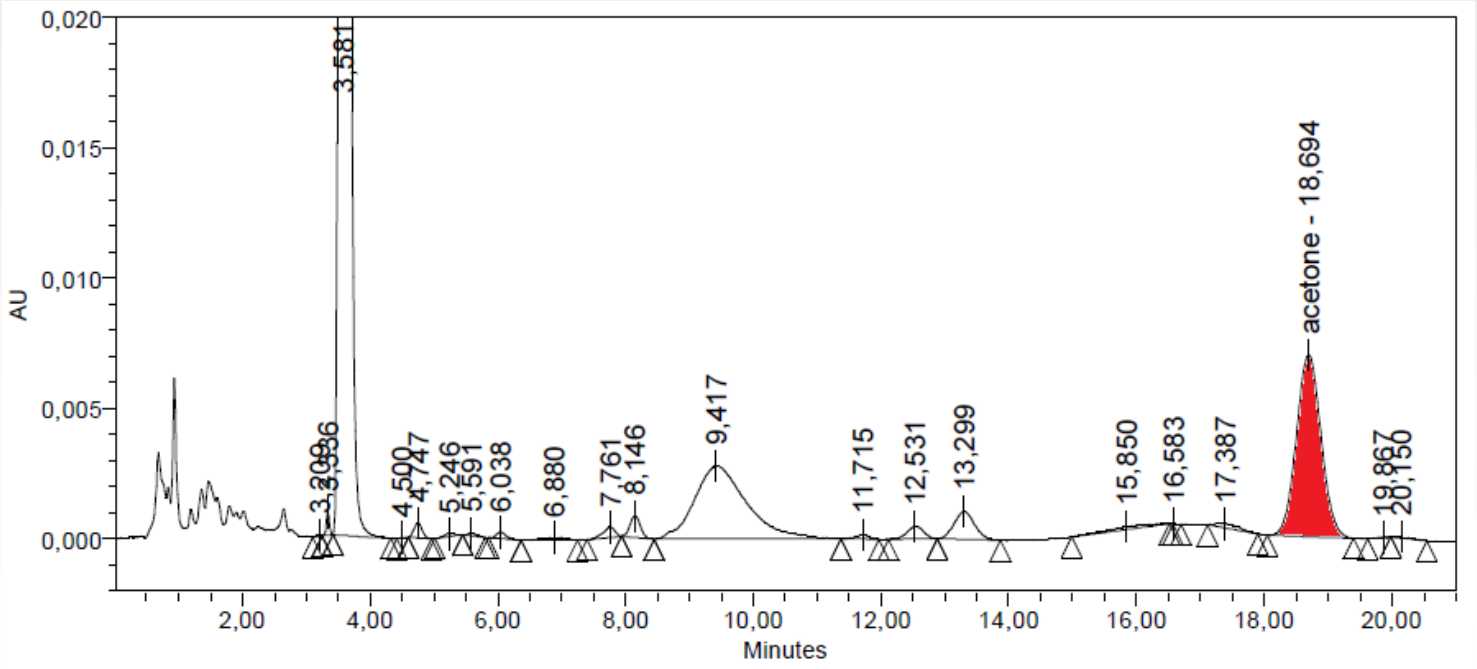
BIOMONITORING
URINARY ACETONE (UV)

- Acetone is a molecule normally present in our body in small quantities. An excess of acetone occurs in severe sugar deficiency, when the body is forced to use almost exclusively fat to satisfy the metabolism. It'is a volatile substance that is also eliminated through breathing, giving the expired air a characteristic smell of ripe fruit.

- An excess of acetone (ketoacidosis) from glucose deficiency can also be found in the decompensated diabetes (where insulin deficiency causes glucose to fail to enter sufficient quantities in the cells) and protracted fasting (especially if carbohydrate).

- Acetone is also used as a solvent, in industrial processing, in high doses, it can cause headache, dizziness, drowsiness, epigastralgia, vomiting, rhinopharyngitis and conjunctivitis. In case of isopropanol intoxication, acetone increases.

BIOMONITORING
URINARY ACETONE (UV)



BIOMONITORING
2,5-HEXANEDIONE IN URINE (UV)

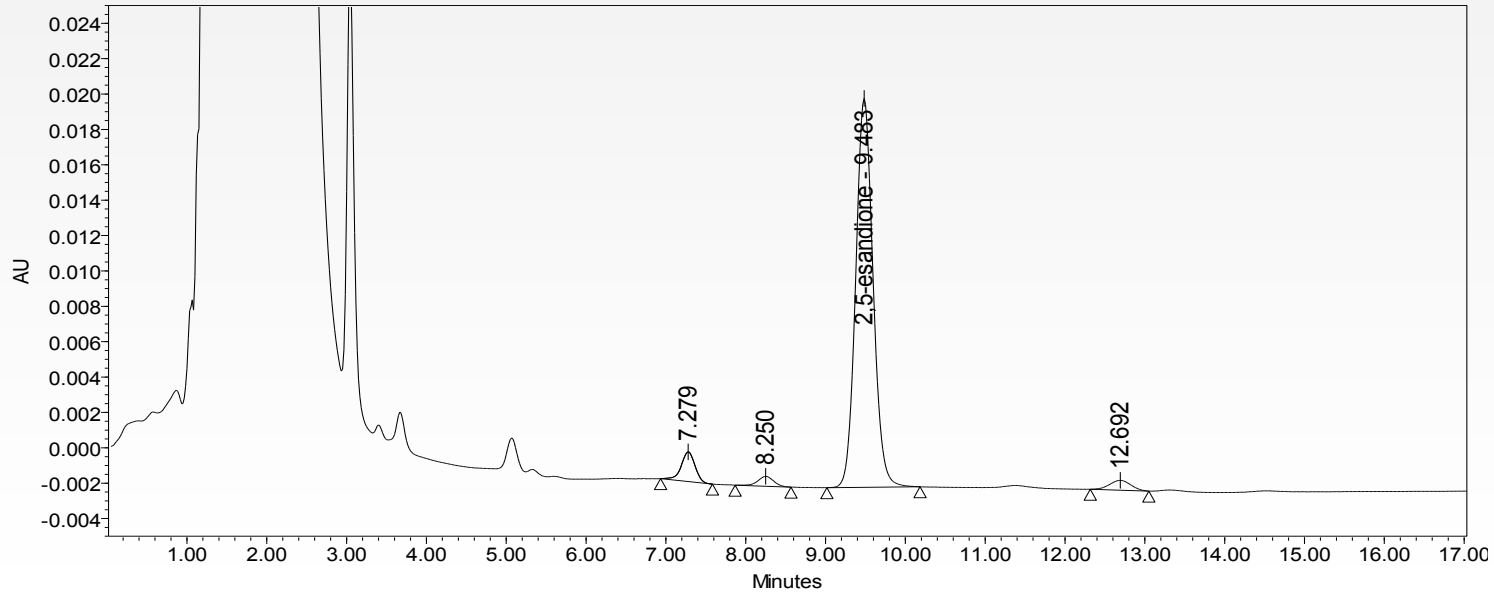
- **2,5-HEXANEDIONE IN URINE (UV);** N-HEXANE IS AN ALIPHATIC HYDROCARBON THAT IS WIDELY USED AS A CONSTITUENT OF INDUSTRIAL SOLVENTS, GLUES, PAINTS, INKS ECC. IT IS BIOTRANSFORMATED BY OXIDASE IN LIVER AND IN SMALLER SIZE IN OTHER TISSUE, THE MAIN METABOLITES EXCRECTED IN URINE ARE 2-HEXANOL, IL 2,5-HEXANEDIONE, IL 2-HEXANONE ETC.

- PROLONGED EXPOSITION LEADS PROGRESSIVE DAMAGE TO SNP, DETERMINING A MOTOR SENSITIVE NEUROPATHY. 2,5-HEXANEDIONE IS THE MAIN TOXIC METABOLITE OF N-HEXANE RESPONSIBLE OF THESE INJURIES.

- DETERMINATION OF 2,5-HEXANEDIONE IN URINE IS USED IN BIOLOGICAL MONITORING EXPOSURE TO N-HEXANE IN PROFESSIONAL PEOPLE EXPOSED.

BIOMONITORING
2,5-HEXANEDIONE IN URINE (UV)

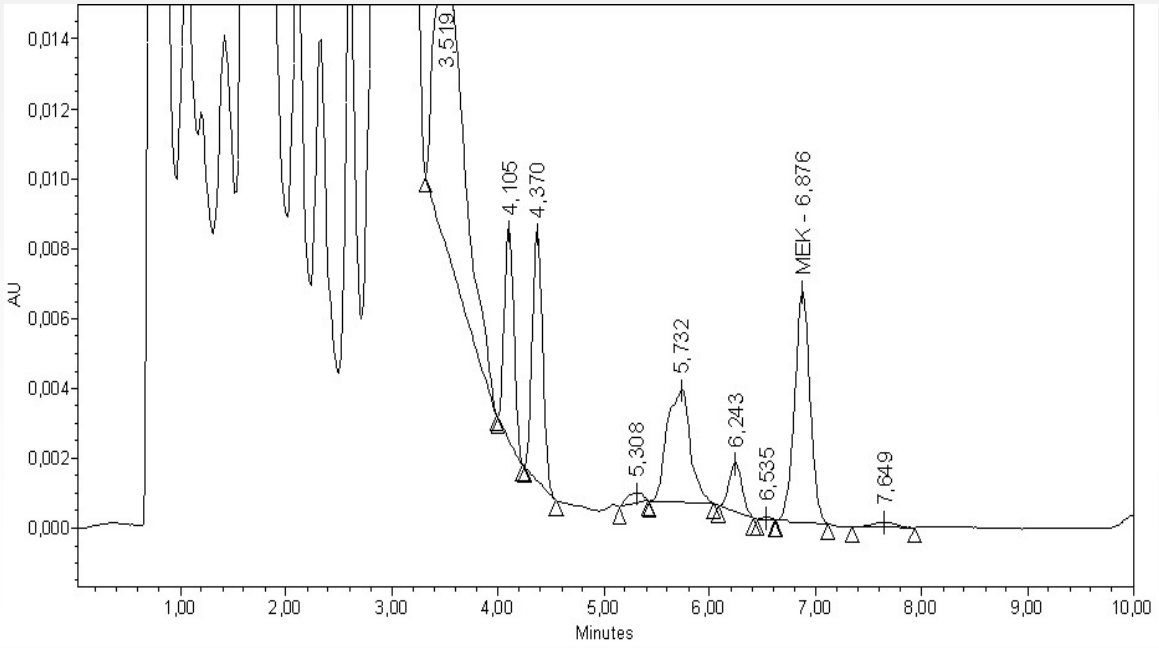
CONCENTRATION LOWER THAN 1 mg/l OF **2,5-ESANDIONE** ARE DETECTED ALSO IN NON-EXPOSED PEOPLES



BIOMONITORING
METHYL ETHYL KETONE IN URINE (UV)

- Methyl ethyl ketone is a solvent and diluent for dyes and paints, it is used in various industrial processes, in the pharmaceutical industry in the formulation of adhesives.
- Exposed workers enter in contact by inhalation and skin contact. Thanks to the rapid metabolism, it is possible to evaluate the presence of metabolites or an unchanged amount of the original molecule in biological fluids (blood and urine) and use them as markers for biological monitoring of occupational exposure.
- It can cause irritation of the skin and the upper airways.

BIOMONITORING
METHYL ETHYL KETONE IN URINE (UV)



BIOMONITORING
CDT (UV)

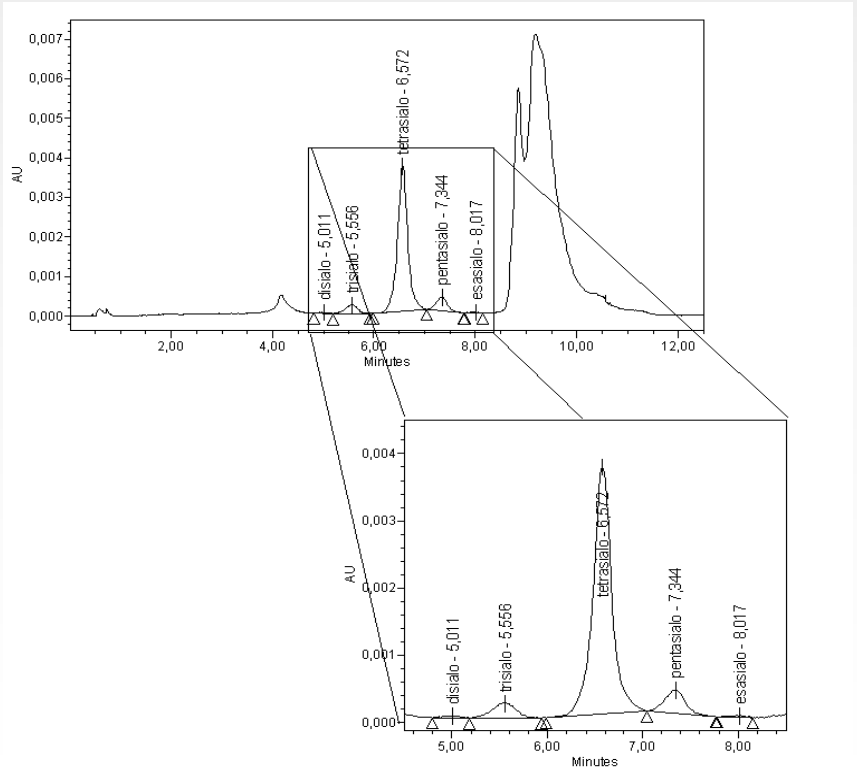
- **CDT CARBOHYDRATE-DEFICIENT TRANSFERRIN (SERUM) (UV/VIS)**, CDT DETERMINATION REPRESENTS THE MARKER OF ALCOHOL ABUSE FOR EXCELLENCE, BOTH IN TERMS OF SENSITIVITY THAT IN TERMS OF SPECIFIC.

- ABUSE OF ALCOHOLIC DRINKS MUST BE REGARDED AS A PRIORITY ISSUE OF PUBLIC HEALTH, IT REPRESENT A RISK FACTOR FOR THE INDIVIDUAL AND SOCIETY, WITH HEAVY IMPACT ON THE HEALTH AND SAFETY OF WORKERS.

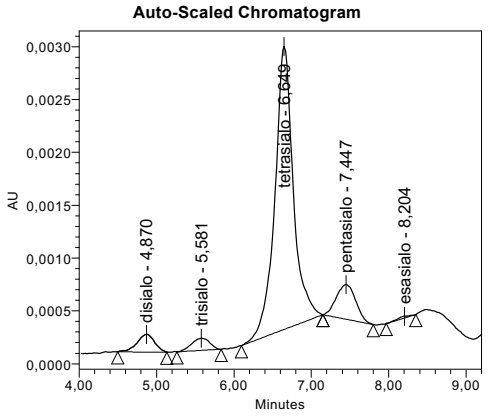
BIOMONITORING
CDT (UV)

- **CDT (UV/VIS);** Compared to traditional markers of chronic alcohol abuse (GGT, MCV, ALT and AST), the CDT has a higher specificity (around 95%) and, not insignificant factor, is not subject to variations caused by other disorders as drugs, diabetes, obesity, liver disease, and hematological disorders.

BIOMONITORING
CDT (UV)



BIOMONITORING
CDT (UV)



Processed Channel:

	Peak Name	Retention Time (min)	% Area
1	disialo	4,870	4,79
2	trisialo	5,581	3,38
3	tetrasialo	6,649	80,99
4	pentasialo	7,447	10,49
5	esasialo	8,204	0,34

VITAMINS PROFILE

- **B6 VITAMIN (FL)** IN SERUM SAMPLES, Vitamin B6 consists of three vitamers: pyridoxine, pyridoxal and pyridoxamine. The metabolically active coenzyme form of vitamin B6 is pyridoxal-5'-phosphate (PLP). Deficiency of vitamin B6 mainly express in alterations of the skin, neurological disorders and anemias. This kit allows the analysis of Vitamin B6 in serum samples.

- **VITAMIN A/E (UV/VIS)** IN SERUM SAMPLES, **Vitamin A** (retinol) is essential for the formation of rhodopsin, for bone metabolism, and for the sythesis of steroid hormones. Deficiency of vitamin A leads to night blindness, dry skin, and loss of hair.
  Vitamin E (α-Tocopherol), as a potent antioxidant, protects LDL cholesterol and cellular membranes from lipid peroxidation, which mainly occurs as a result of increased. This Kit allows the simultaneous analysis of vitamin A and E.

- VITAMIN C (Plasma) (UV/VIS); DEFICIENCY IN POPULATION LEADS INJURY OF A PARTICULAR PATHOLOGICAL CONDITION, THE SCURVY. IT DETERMINES ALSO ASTENIA, ANEMIA, BONES ALTERATIONS (OSTEOPOROSIS), DEPRESSION, ANEMY AND DIFFERENT RESISTANCE TO INFECTIONS.

VITAMIN PROFILE
VITAMIN A / E (UV/VIS)

VITAMIN A / E (UV/VIS) IN SERUM SAMPLES, VITAMIN A AND 'ESSENTIAL TO FORM RHODOPSIN, HIS LACK LEADS TO BLINDNESS' NIGHT, DRY SKIN AND HAIR LOSS.

VITAMIN PROFILE
VITAMIN A / E (UV/VIS)

VITAMIN A (retinol)
ANTIOXIDANT EFFECT
MECHANISM OF VISION
SYNTHESIS OF GLYCOPROTEINS, GLYCOPEPTIDES AND PROTEOGLYCANS
SYNTHESIS OF BONE TISSUE
CELL DIFFERENTIATION AND PROLIFERATION

VITAMIN PROFILE
VITAMIN A / E (UV/VIS)

HYPERVITAMINOSIS – VITAMIN A

NAUSEA

VOMIT

MIGRAINE

LOSS OF APPETENCE

TIREDNESS

GROWTH DISORDERS

BONE FRACTURES

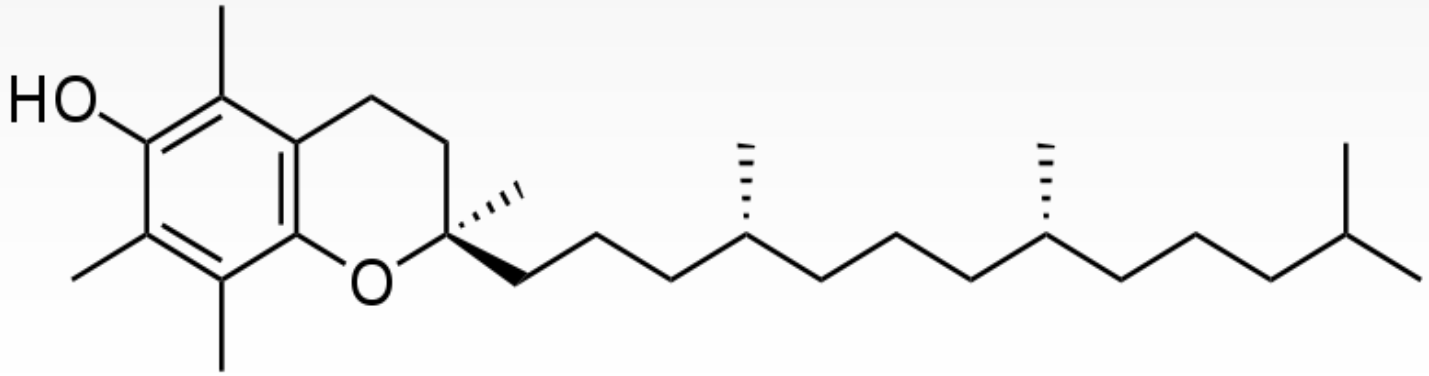
FETAL MALFORMATIONS

VITAMIN PROFILE
VITAMIN A / E (UV/VIS)

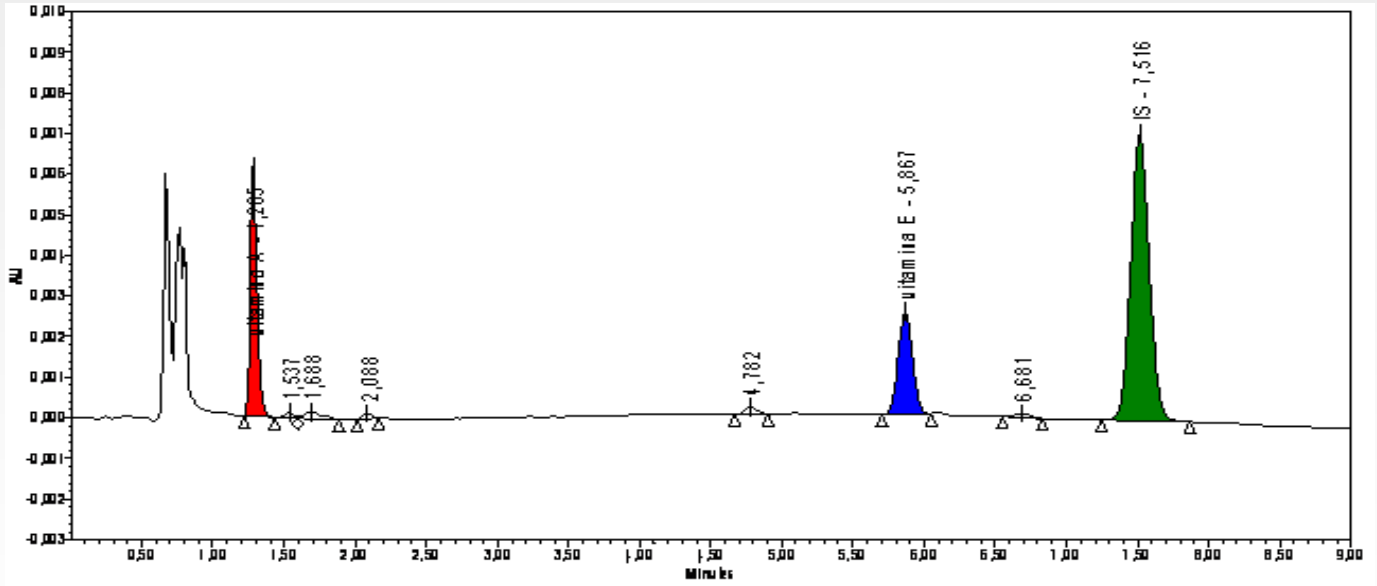
VITAMIN E

(α-TOCOPHEROL)

ANTIOXIDANT EFFECT



VITAMIN PROFILE
VITAMIN A / E (UV/VIS)



vitamina A

vitamina E

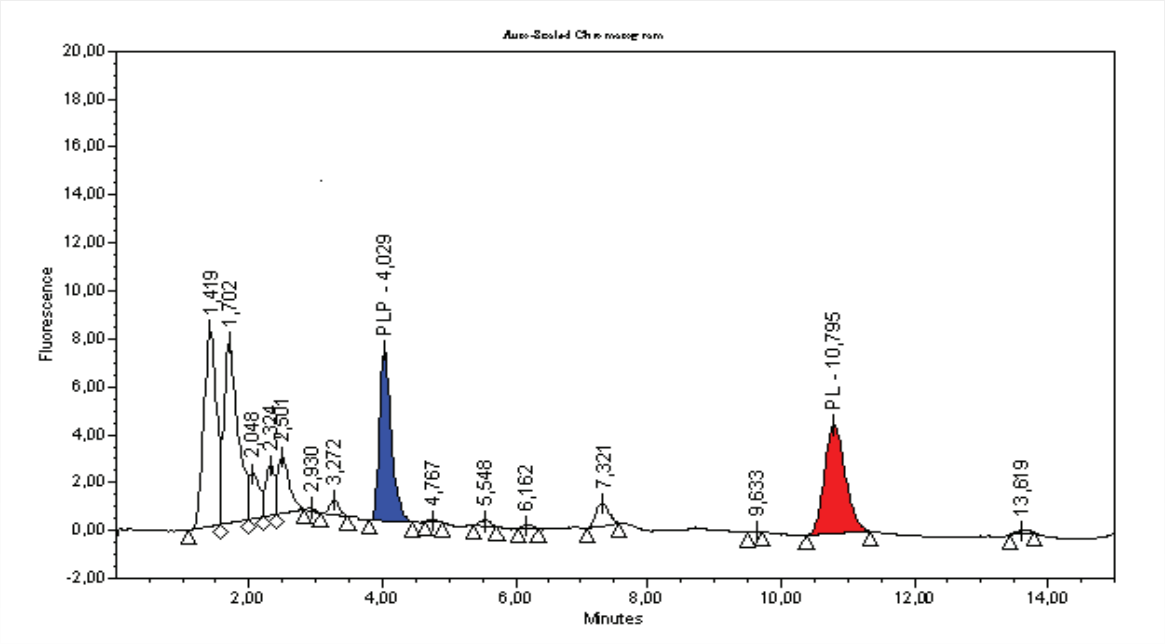
standard interno

VITAMIN PROFILE
VITAMIN B6 (FL)

VITAMIN B6 (FL) IN SERUM SAMPLES, DEFICIENCY OF VITAMIN B6 GIVES DERMAL ALTERATIONS, NEUROLOGICAL DISORDERS AND ANEMIA

Vitamin B1, thiamine, thiamine pyrophosphate (TPP) is essential for the normal functioning of the body, it is a coenzyme of carbohydrate metabolism and is essential for the normal function of the body. The deficiency is a symptom of malnutrition, alcoholism, it can also occur in particular clinical situations (e.g. haemodialysis). The "BeriBeri" syndrome occurs in cases of severe deficiency.

VITAMIN PROFILE
VITAMIN B6 (FL)



PLP = PIRIDOXALFOSFATO CP:09-0001-VITAMINA B6)

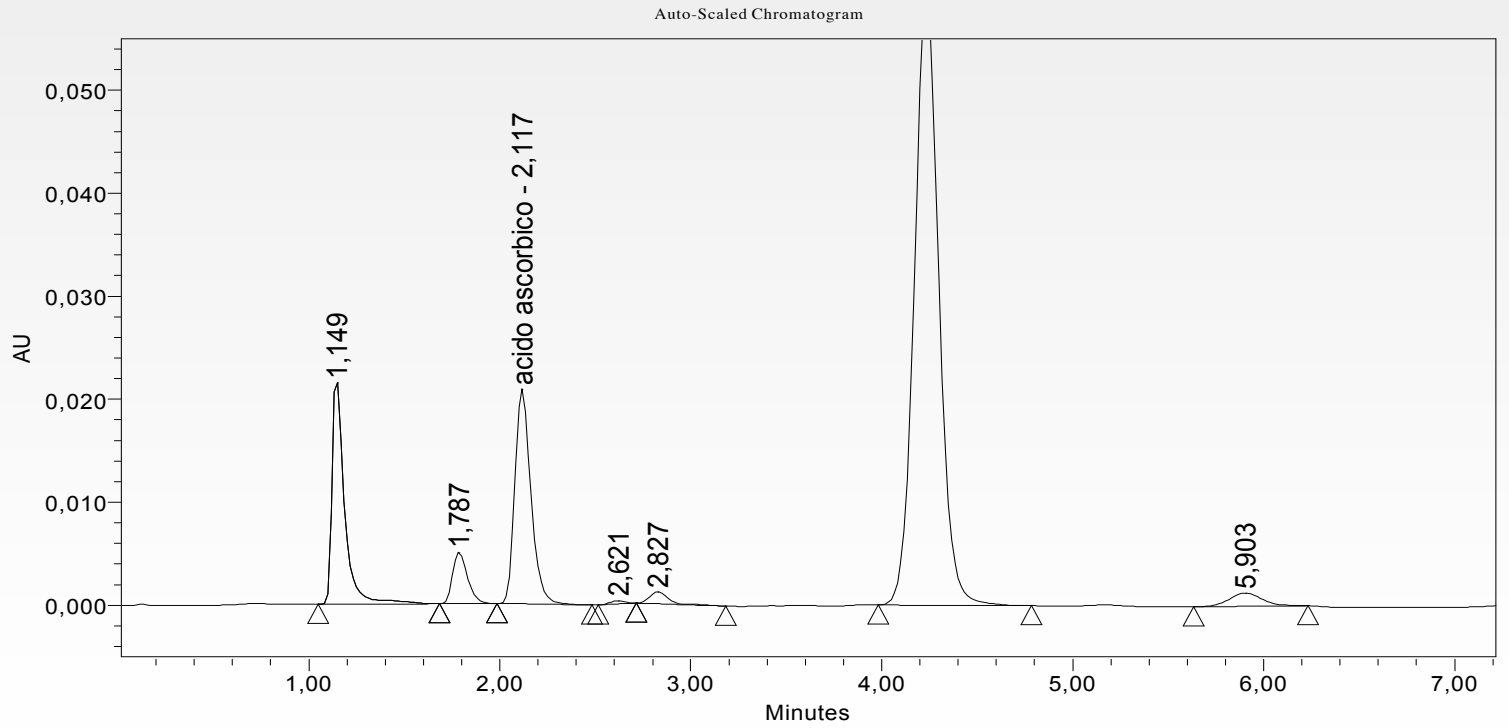
PL = PIRIDOXALE

VITAMINS PROFILE
VITAMIN C (UV) PLASMA

Ascorbic Acid is a highly water-soluble natural vitamin. It's is a powerful reducing agent that plays a key role in many biological processes; It has antioxidant activity since it can be reversibly oxidized to Deidroascorbate. Man needs it in his diet, the daily requirement is estimated at about 50 to 100 mg / day.

Deficience in Vitamin C lead in man particular disease, the scurvy. It leads also to asthenia, anorexia, bone disorders (osteoporosis), depression, anemia and decreased resistance to infections.

VITAMINS PROFILE
VITAMIN C (UV) PLASMA



NEW DEVELOPED KITS

DYSBIOSIS DIAGNOSIS

- Skatole in urine samples (Dysbiosis)
- INDICANO in urine samples (Dysbiosis)
- INDOLE in urine samples (Dysbiosis)

INTESTINAL PERMEABILITY

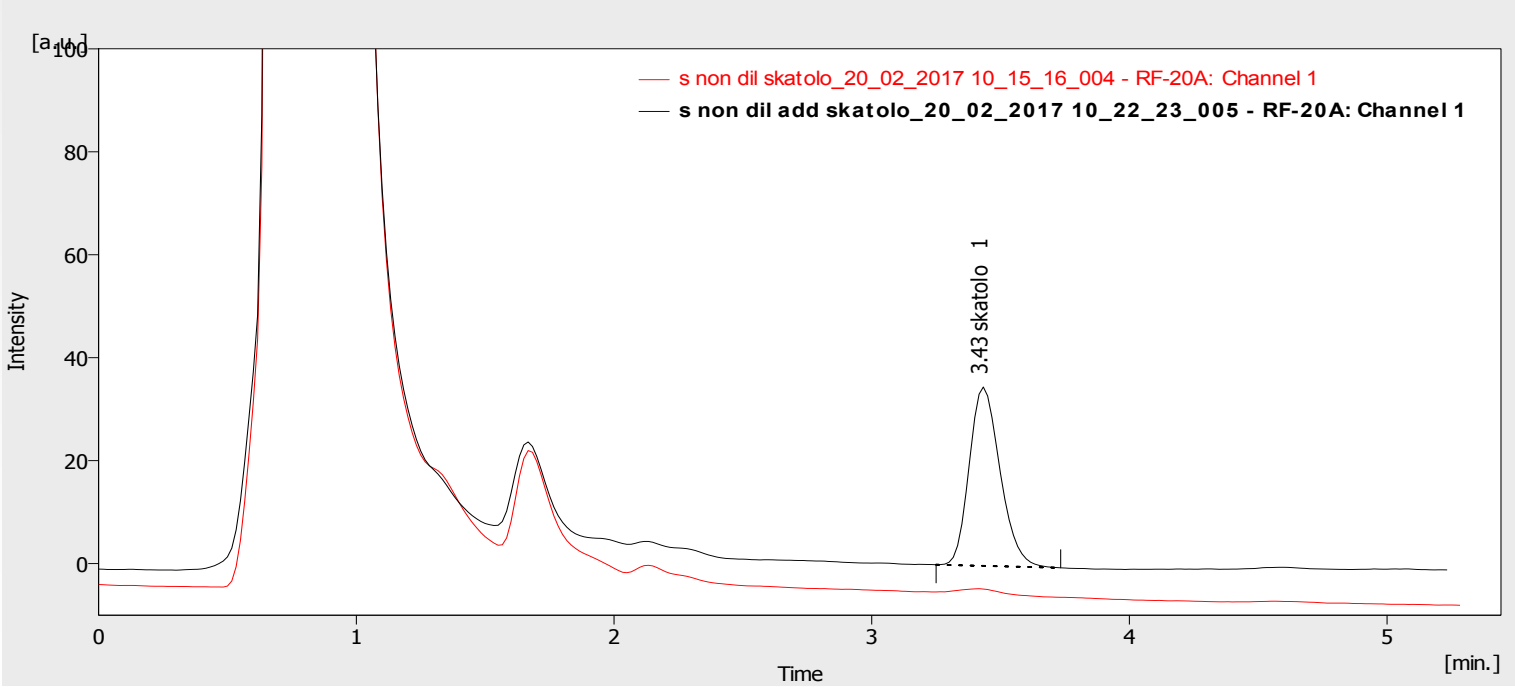
- MANNITOL in urine samples
- LACTULOSE in urine samples

DYSBIOSIS TEST
SKATOLE in Urine Samples

Disbiosis consists of an alteration of enzymes and bacterial flora that live within intestine, called intestinal microbiosis

If the Skatole exceeds physiologically levels, could lead to problem in large intestine, especially the colon.

DYSBIOSIS TEST
SKATOLE in Urine Samples

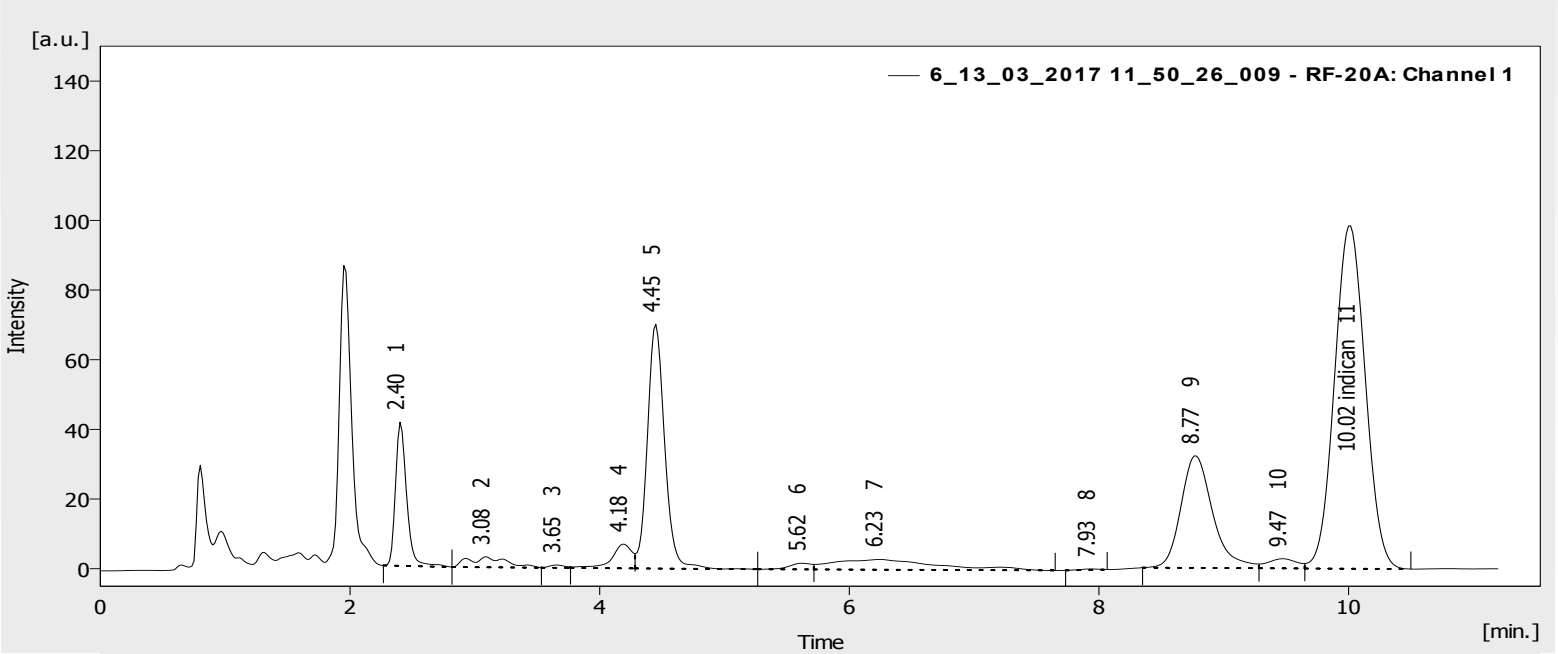


DYSBIOSIS TEST
INDICANO in Urine Samples

Disbiosis consists of an alteration of enzymes and bacterial flora that live within intestine, called intestinal microbiosis.

If Indicano exceeds physiologically levels, could lead to problem in small intestine.

DYSBIOSIS TEST
INDICANO in Urine Samples

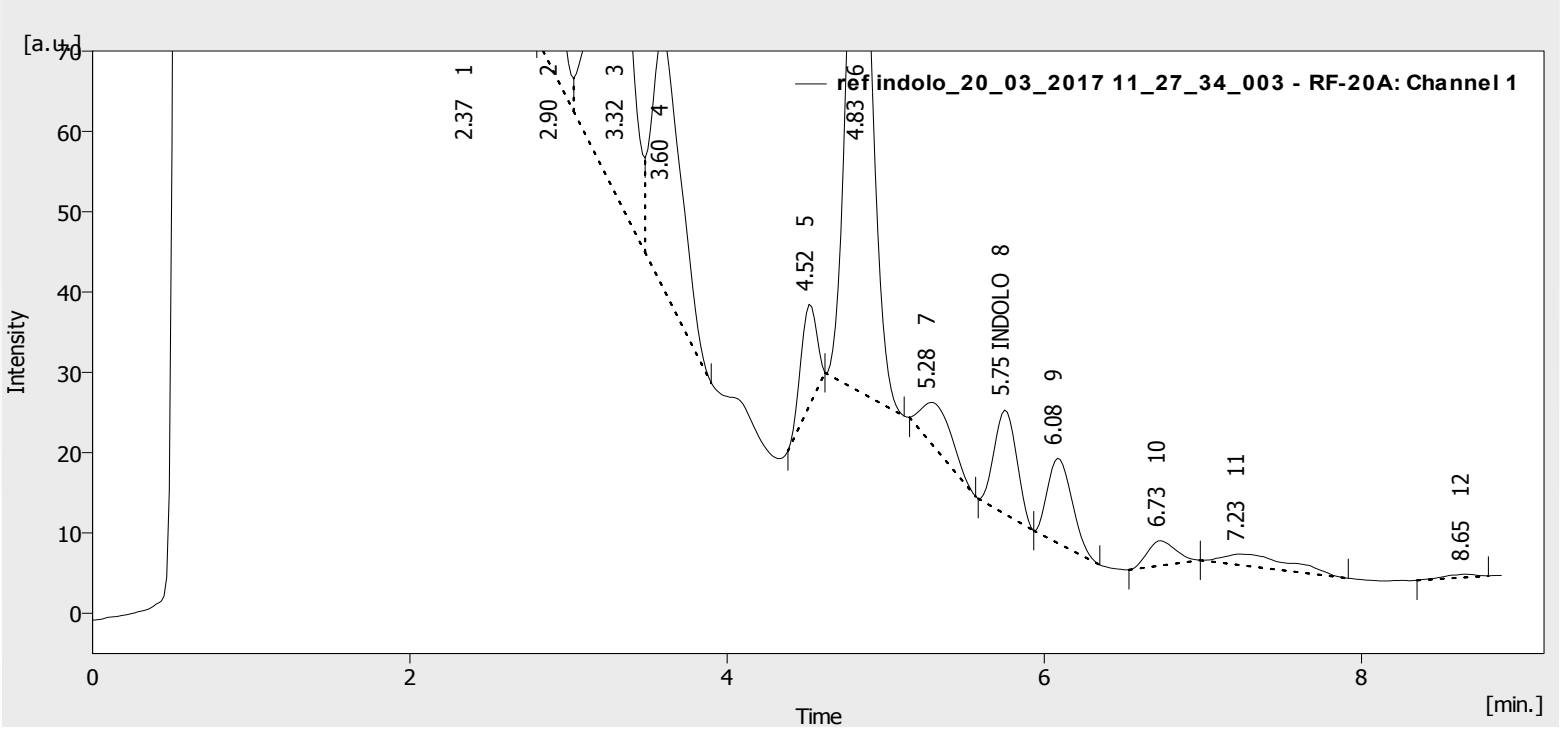


DYSBIOSIS TEST
INDOLE in Urine Samples

Disbiosis consists of an alteration of enzymes and bacterial flora that live within intestine, called intestinal microbiosis.

If Indole exceeds physiologically levels, could lead to problem in intestine.

DYSBIOSIS TEST
INDOLE in Urine Samples



LC-MS/MS

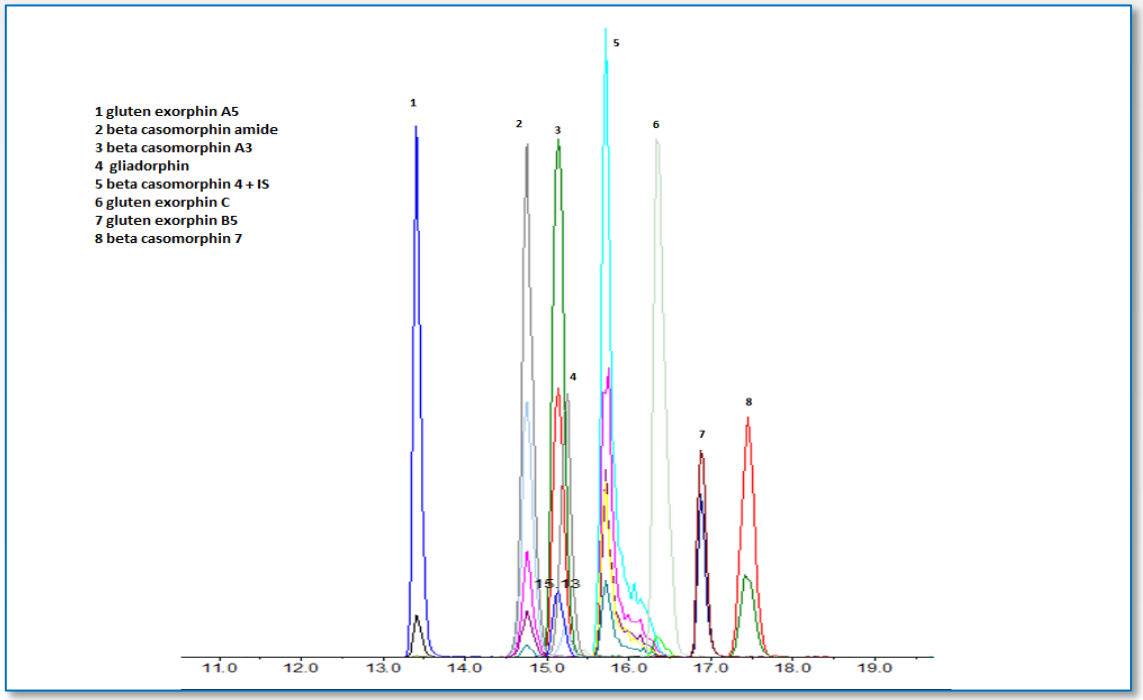
Determination of Casomorphine and Gliadorphine in urine

- DETERMINATION OF CASOMORPHIN AND GLIADORFIN PEPTIDES IN URINE BY HPLC CHROMATOGRAPHY AND MS/MS DETECTOR.
- EXORPHINS ARE BIOACTIVE PEPTIDES THAT CAN REACT WITH OPIOID RECEPTORS. THEY DERIVE FROM THE INCOMPLETE HYDROLYSIS OF CASEIN (MAIN MILK PROTEIN) GLUTEN (PROTEIN COMPLEX TYPICAL OF SOME CEREALS)

LC-MS/MS

Determination of Casomorphine and Gliadorphine in urine

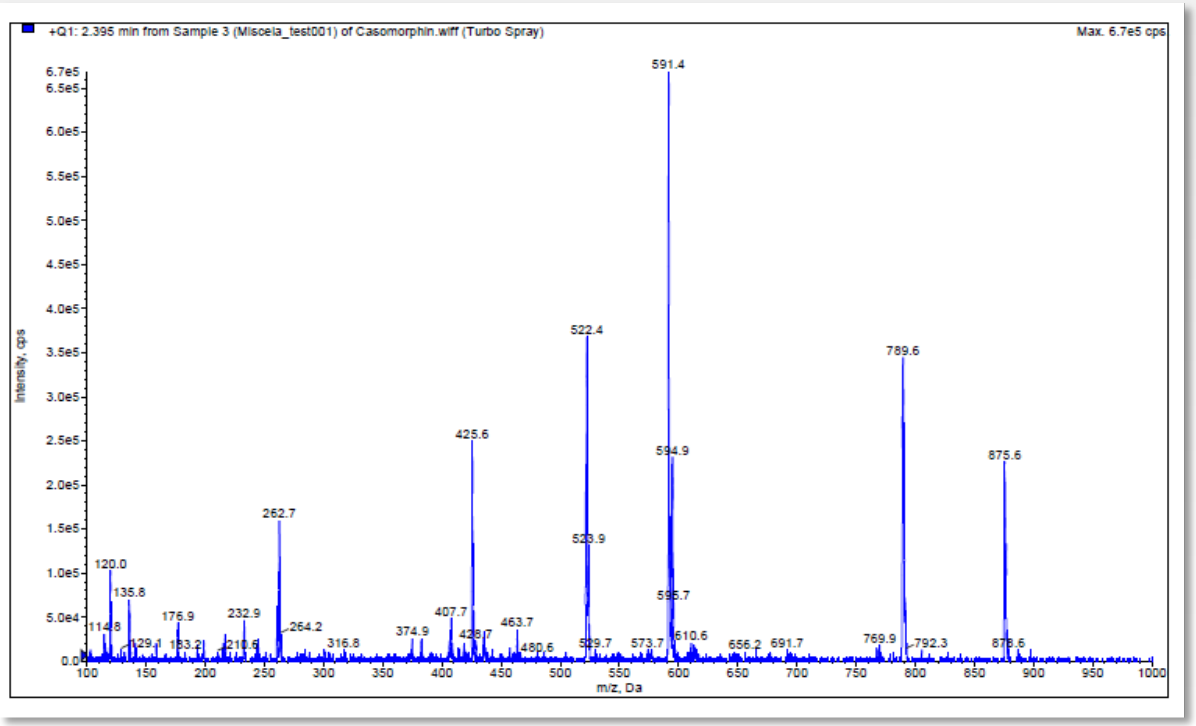
CALIBRATION STANDARD



LC-MS/MS

Determination of Casomorphine and Gliadorphine in urine

FRAGMENTATIONS

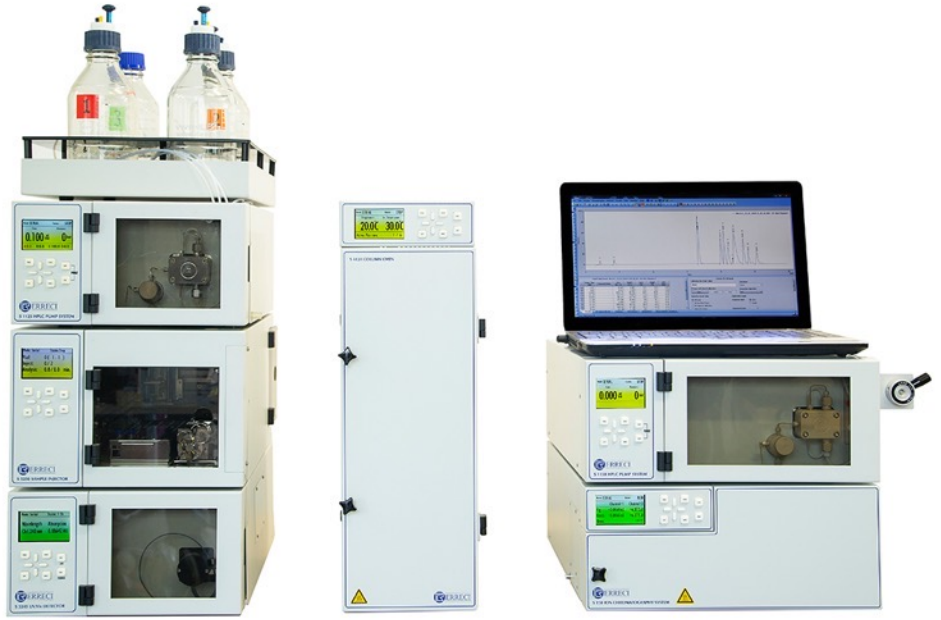


MODULAR HPLC SYSTEM

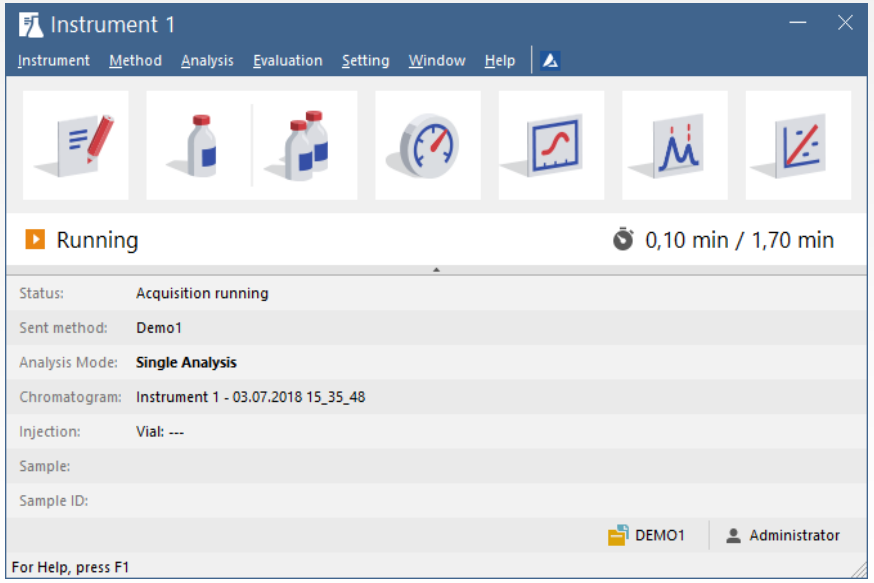
MODULE OF SYSTEM:

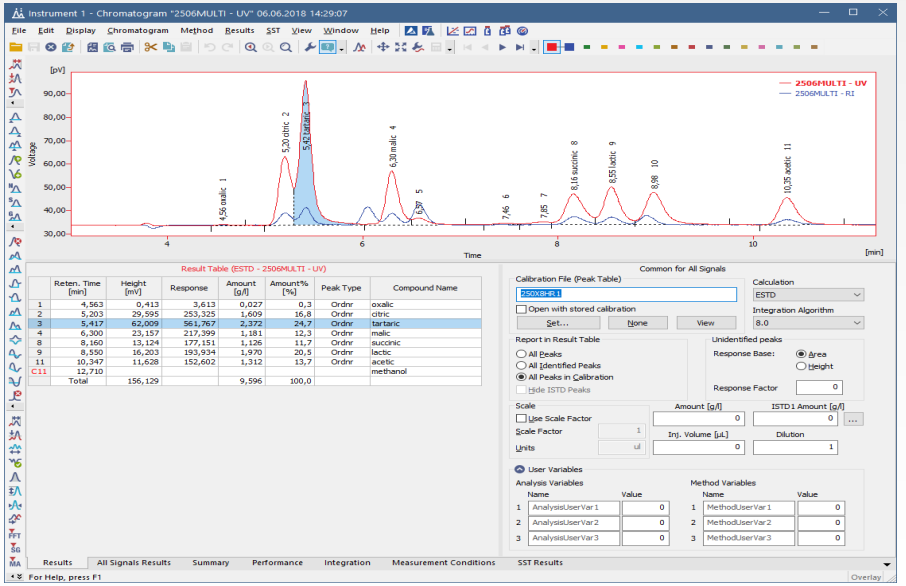
- **HPLC PUMP ISOCRATIC OR GRADIENT (UP TO QUATERNARY)**
- **UV/VIS DETECTOR (Variable wavelength) (OPION DOUBLE WAVELEBGTH OR DAD)**
- **FLUORIMETRIC DETECTOR (OTHER DETECTOR AVAILABLE)**
- **COLUMN OVEN (UP TO 6 COLUMNS) WITH SELECTION VALVE**
- **4 CHANNELS ON-LINE DEGASER**
- **AUTOSAMPLER (OPTION THERMOSTATION AND/OR DERIVATIZZATION)**
- **COMPLETE SOFTWARE**
- **DATASTATION**
- **REMOTE TECHNICAL ASSISTANCE AND APPLICATIVE SUPPORT**
- **ERRECI AS UNIQUE PARTNER (HPLC AND KIT)**
- **SEVERAL PURCHASE FORMULA**

MODULAR HPLC SYSTEM



MODULAR HPLC SYSTEM





MOREOVER

- **DEVELOPMENT OF CUSTOM METHOD**
- **TECHNICAL SERVICE AND APPLICATION SUPPORT TO ADD NEW PARAMETERS**
- **TECHNICAL SERVICE**
- **WORKSHOP**

ERRECI

STRUMENTAZIONE SCIENTIFICA E ANALITICA

VENDITA E ASSISTENZA TECNICA

www.erreci-tech.com

ERRECI S.r.l.

Via delle Robinie, 21

20090 – OPERA (MI)

T. +39/02/57600456

Fax +39/02/57600082

e-mail: info@erreci-tech.it

web: www.erreci-tech.com