LABORATORY GUIDE

January 2018

‘Celebrating Service to Practitioners and Patients for 33 Years’

• The Stone House • 9 Weymouth Street • London • W1W 6DB England •
  • Tel: (+44) 020 7636 5959/5905 • Fax: (+44) 020 7580 3910 •
  • Email: info@biolab.co.uk •

BIOLAB Ltd Registered in England No. 3222680.
This is an abbreviated copy of our Laboratory Guide for the Biolab web site. The complete document is available for doctors and practitioners on request. Our web site remains the primary source of information on Biolab tests.

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What is Nutritional and Environmental Medicine?

The clinical and biochemical laboratory services available at Biolab are based on the simple understanding that if the body does not have the appropriate amounts of the basic building blocks (vitamins, minerals, amino acids, fatty acids etc.) necessary for optimum function, that body will not be as healthy as it could be.

If one considers that the genes of *Homo sapiens* evolved over millions of years in environments very different from those we encounter in present day industrialised society, looking at those areas of today’s environment that differ from what we know of pre-industrial, pre-agricultural environments leads to immense diagnostic and therapeutic potential.

A helpful way of approaching the diagnosis and management of clinical problems is to consider any symptom or clinical sign as a manifestation of the individual’s failure to adapt adequately to the sum total of their environmental challenges. An important fundamental aspect of this approach is an awareness of the importance of the protective effects of nutrients against toxic substances, and that adequacy of nutrients is *absolutely vital* for accurate gene expression.

**Nutrient deficiencies and toxic load**

It has been clearly demonstrated over many years that individuals can be deficient in one or more micronutrients despite having what most would consider an adequate diet. Illness, lifestyle factors such as alcohol intake, ingestion of medical and illegal drugs etc., can affect nutrient status with a

As medical students doctors receive some training regarding deficiencies of such nutrients as iron, Vitamin B₁₂, folic acid, calcium and potassium, but we learnt little or nothing about deficiencies of essential minerals such as magnesium, zinc, manganese, cobalt, chromium or selenium; or vitamins such as nicotinic acid (niacin, Vitamin B₃), pyridoxine (B₆), or biotin, or of essential fatty acids such as linoleic or alpha linolenic acid, or of specific amino acids. Deficiencies of any of these and many others can result in profound impairment of function of the cardiovascular system, brain or immune system etc., or one’s susceptibility to various cancers, or the ability to recover from illness or surgery, or to protect oneself against the many man-made toxic substances in our food, water and air that can cause ill-health.

Biolab provides a wide range of tests that enable the practitioner to obtain a picture of patients’ nutritional, toxic and functional status, thereby providing the necessary information to help patients to overcome conditions which have not previously yielded to pharmaceutically oriented interventions.

‘Orthodox’ medicine

Nutritional and environmental medicine is *not* ‘alternative’ or ‘unorthodox’. It embraces all ‘orthodox’ medicine and places it in the context of the ‘nutrition-gene-environment’ triad, and refines it with the clear aim of improving quality of patient care, and reduce the dependency of prescribing pharmaceutical drugs. It is a very exciting approach, because it gives rise to therapeutic interventions that cause many clinical conditions to improve or resolve that had hitherto been resistant.

**Dr Stephen Davies**

(Medical Director, Biolab)
**Introduction to Biolab**

Biolab Medical Unit, established by Dr Stephen Davies in 1984, is a medical referral laboratory that specialises in nutritional & environmental medicine and is located in the heart of the West End of London.

The laboratory is staffed by a highly qualified & experienced team, led by Laboratory Director Dr Nicholas Miller PhD FRCPath, and is equipped to carry out a wide range of tests to assess the nutritional status of patients. Tests include assessment of vitamin, mineral, essential fatty acid and amino acid status, and a wide range of other functional metabolic tests. Many of our tests require expensive high-tech instrumentation and these tests are not routinely available at other pathology laboratories.

**Who can refer patients for tests?**

We are a practitioner referral unit and perform tests requested by medically qualified practitioners, dental surgeons, nutritional therapists, osteopaths and chiropractors, and some other registered complementary practitioners (please enquire for further details). For non-medical referrals we can send a duplicate copy of reports to the patient’s General Practitioner (at the patient’s discretion).

**Consultations**

There are a number of doctors holding clinics at Biolab who are available for appointments. Please contact them on the numbers below for details of fees and appointments availability:

- Dr Charles Forsyth - 01737 226338
- Dr Jenny Goodman - 020 8216 3751
- Dr Dee Marshall - 07738 009978 / 07958 163013
- Dr Franziska Meuschel - 07946 55206
- Dr Alan Stewart - 01273 487003

There are also a number of nutritional therapists who consult from Biolab and are available for consultations (please enquire for further details).

**Research**

Biolab is actively involved in researching the effects of nutrition on disease and health and we have published many papers based on our findings - please see our web site for further details (copies of papers available on request).

**Test protocols**

For tests that can be performed with standard pathology laboratory equipment we are able to provide test protocols. For further details contact a member of our laboratory staff.

**Quality control**

Biolab assists doctors with the detection of nutritional imbalances in their patients by the use of the latest validated scientific methodologies and reporting systems to ensure optimal care.

Quality assurance is essential in clinical laboratories for the provision of precise and accurate analytical results. This encompasses a range of measures to ensure the reliability of investigations, including test selection, obtaining a satisfactory sample, analyzing it correctly and recording the result promptly, as well as the appropriate interpretation of the results. Biolab procedures are well documented and the results are carefully recorded so that they can be referred to for many years in the future.

Biolab laboratory tests are internally quality controlled to keep a check on day-to-day analytical variations. Biolab also participates in a range of CPA (UK)-accredited quality assurance schemes for trace elements, vitamins, enzymes and antioxidants operating under the UK NEQAS code of practice. We also participate in a number of highly respected international quality assurance schemes.

Biolab laboratory staff regularly attend a range of continuing professional development seminars to ensure satisfactory knowledge and competence of all analytical procedures.

**Further information**

Our web site (www.biolab.co.uk) contains up to date details on all our tests & news of latest developments including new tests, Biolab workshops & conferences, publications etc. A complimentary CD-ROM including all Biolab documentation and publications is available on request.
General information

The Stone House, 9 Weymouth Street,
London W1W 6DB
(corner of Weymouth St & Hallam St, nearly opposite Star Bucks)

Nearest tubes: Regents Park & Great Portland Street 5 minutes, Oxford Circus 10 minutes.

Biolab is within the London Congestion Charge zone (£11.50 per day which must be paid on the day)

Opening hours

Biolab reception is open from 9.00am to 5.30pm daily, Monday to Friday.

A wheelchair ramp is available when required.

Phlebotomy services

Patients can be seen for tests between 9.30am and 5:00pm Monday to Thursday and 9:30am to 2:00pm on Fridays by our highly experienced nursing & phlebotomy staff who have received extensive training in sample collection techniques for our tests. To avoid delays it is helpful if appointments are made beforehand. Please ensure that patients are aware of any special preparations prior to their tests, e.g. fasting requirements, supplement avoidance etc and the need to stay at Biolab for the duration of some of the tests (explained to patients when they book their own appointments).

Appointments are normally available within a few days for most tests.

Payment of Fees

In order to reduce administrative overheads and to keep our prices to a minimum, we ask that patients settle their account at the time of their appointment. Payment in sterling can be made by cash, cheque, bankers’ draft or debit/credit card. Accounts may be sent to the referring practitioner by prior arrangement.

For practitioners who regularly refer patients to Biolab we are able to offer monthly account facilities (subject to status). Please contact our accounts department for further details.

Postal samples

Please note that it is important, particularly with trace element analysis, that the correct sample tubes are used and that the samples are separated. We can only guarantee the validity of the results if the correct sampling procedures have been adhered to.

We recommend Royal Mail Special Delivery (pre 1pm) for delivery of specimens, guaranteeing next day delivery, (please note the laboratory is closed on Saturdays).

Test kits & request forms

We are able to supply some of the specialist tubes required for our tests, along with a limited number of postal carriers. Please contact Biolab if you require these or pathology request forms (see samples on pages 23-25).

Results

Many of our test reports are dispatched by First Class post within three or four working days of receipt of the sample. Other test reports normally follow within 10 working days. Our senior laboratory staff comment on all reports containing abnormal or unusual results. Two copies of all reports are provided.

Reports can also be E-mailed or faxed by prior arrangement.
Guidance on submitting samples for analysis

**Important Note:** If you have access to a centrifuge, serum samples should be separated before posting. Every attempt should be made to ensure that all unseparated blood samples reach the laboratory within 24 hours. Because the laboratory is closed at the weekends blood samples should not be posted on a Friday except by prior arrangement. Please be sure to use trace element free tubes for samples for trace element analysis (available on request).

Routine pathology tests are referred to external CPA accredited laboratories:

In addition to the specialised tests offered at Biolab, we can also accept requests for conventional haematology and biochemistry tests which we send out to a small number of highly select and reliable clinical laboratories that provide a very high standard of service (all CPA accredited).

These prices are for samples taken simultaneously with Biolab nutritional tests.

Tests referred to external laboratories are highlighted with *(Ext)* alongside the test description in the following pages.

Turnaround times:

An estimated turnaround time is provided alongside each test listed in this guide representing the average turnaround time from receipt of sample to the issuing of our report. We always endeavour to provide the fastest possible turnaround time for results, but the specialist nature of many of our tests means that some turnaround times are longer than are typically required for conventional pathology investigations.

Wherever possible, and in most cases, we will meet the indicated turnaround times, but unforeseen circumstances such as instrument failures and reagent supply delays may occasionally mean that turnaround times are extended. In these cases we will make every effort to complete tests at the earliest possible opportunity.

Test fees

Please note that these prices are subject to change without notice (correct as of 1st January 2015). Please confirm the price of tests at the time of request. Unless it is account to practitioner we kindly ask that patients settle their Biolab account at the time of testing.

Further assistance & information

The Biolab web site (www.biolab.co.uk) includes considerably more information about our work than we can include in the laboratory, including sample reports, test datasheets and detailed information about many of our tests.

The aim of this guide is to provide you with details about Biolab and the tests we offer. We have made every effort to include answers to the questions we are regularly asked, but there are some questions and queries that can only be answered by contacting a member of the Biolab staff.

Please note: Although we attempt to answer all telephone enquiries immediately, the nature of the work at Biolab means that some members of the Biolab staff are not always available to talk on the telephone and you may be asked to call back at a later time. We aim to respond to E-mail enquiries within 24-36 hours.

Key contacts:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Director</td>
<td>Dr Stephen Davies MA BM BCh FACN</td>
<td>(e-mail <a href="mailto:drstephen@biolab.co.uk">drstephen@biolab.co.uk</a>)</td>
</tr>
<tr>
<td>Laboratory Director</td>
<td>Dr Nicholas Miller PhD FRCPath</td>
<td>(<a href="mailto:n.j.miller@biolab.co.uk">n.j.miller@biolab.co.uk</a>)</td>
</tr>
<tr>
<td>Manager</td>
<td>Mark Howard</td>
<td>(<a href="mailto:mark@biolab.co.uk">mark@biolab.co.uk</a>)</td>
</tr>
<tr>
<td>Head of nursing</td>
<td>Melita Dean SRN</td>
<td></td>
</tr>
<tr>
<td>Accounts &amp; Practice Manager</td>
<td>Helen Hayes BA</td>
<td>(<a href="mailto:Helen@biolab.co.uk">Helen@biolab.co.uk</a>)</td>
</tr>
</tbody>
</table>
Trace & Toxic Elements

The following table indicates the most suitable sample to use for individual trace and toxic element levels.

Navy blue top trace element tubes
Please note that we use navy blue top EDTA (plasma) tubes for plasma minerals and blood toxic elements. [B] therefore refers to tube Beckton Dickinson Vacutainer code 368381 - available on request.

<table>
<thead>
<tr>
<th>Preferred samples by element:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
</tr>
<tr>
<td>Zinc</td>
</tr>
<tr>
<td>Copper</td>
</tr>
<tr>
<td>Iron</td>
</tr>
<tr>
<td>Chromium</td>
</tr>
<tr>
<td>Cobalt</td>
</tr>
<tr>
<td>Manganese</td>
</tr>
<tr>
<td>Molybdenum</td>
</tr>
<tr>
<td>Selenium</td>
</tr>
<tr>
<td>Iodine</td>
</tr>
<tr>
<td>Lead, cadmium</td>
</tr>
<tr>
<td>Aluminium, mercury</td>
</tr>
<tr>
<td>Arsenic</td>
</tr>
</tbody>
</table>

Minerals

Minerals obtained from the diet, often at extremely low levels, are essential components of many biological functions. Twenty-First Century Western diets frequently do not contain sufficient levels of these minerals, and with environmental challenges further increasing requirements, deficiencies can develop over a period of time leading to sub-clinical deficiencies and eventually disease. The National Diet and Nutrition Surveys provide statistics on the prevalence of mineral (and vitamin) deficiencies in the “healthy” UK population (further details on request). Correlations with disease are well established in the medical literature.

Mineral Profile(plasma) with red cell magnesium
Ca,Cr, Cu, Fe, Mg, Mn, Se, Zn, RBC Mg
[B,Y,Gn,NS, TAT 3]

Above without red cell magnesium
[B,Y,NS, TAT 3]

Osteoporosis Urine Elements Profile
Measurements on early morning, second void urine samples assess excretion rates of calcium, phosphorus, magnesium and zinc with the result normalised as the molar ratio to creatinine.
[EMU 2nd void, NS, TAT 5-7]

Individual minerals in plasma, red cells, whole blood or urine may also be requested (please ask for further details):
Iodine - urine [MSU, TAT 5]
Iodine/creatinine ratio - urine [MSU, TAT 5]
Iron - plasma [Y, TAT 3]
Total iron binding capacity - serum [Y, TAT 3]
Iron & Total Iron Binding Capacity [Y, TAT 3]
(ferritin also available - see later)
Magnesium - red blood cell [Y,GN, NS, TAT 3]
Molybdenum - plasma [B, TAT 3]
Phosphate - serum [Y, TAT 3]
Selenium - red cell [2 x B, TAT 3]

Hair Element Analysis

A range of 18 minerals and toxic elements. About 0.5g of hair cut close to the scalp from the back of the head, or nape of the neck is required (about 1 heaped tablespoon full), use request form from our web site.

NOTE: This is a screening test only. Abnormalities should be confirmed with appropriate blood or urine tests.
[TAT 7-10, see request form for full instructions]
Toxic Elements

Toxic elements are primarily released into the environment by industrial activity, although ground source levels can also be significant in some areas. Their use is widespread leading to many possible sources of exposure along with contamination in the food chain (i.e., fish and rice in particular). Toxic elements serve no biochemical purpose, and human biochemistry is adversely affected by exposure (which can impair biochemical pathways and result in accumulation with time). Exposure to, and in some cases accumulation of, toxic elements has been associated with many of the health problems commonly seen in Western populations.

Toxic Metals Screens (urine or blood)
A screen of the 18 toxic metals most frequently encountered in the environment (16 in blood). Measured using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Elements include: aluminium, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper (urine only), lead, manganese, mercury, molybdenum, nickel, selenium, thallium, tin and zinc (urine only).

[6HrU/EMU or B, avoid fish and shellfish for 5-7 days prior to providing sample, TAT 5]

Fluoride with above urine screen

Fluoride
Measured in urine or drinking water sample.

[MSU, TAT 10]

Industrial Screen (toxic elements) - Blood
Lead, cadmium and manganese

[B, TAT 5]

MELISA Metal Sensitivity Tests
See page 14 for further details.

Mercury
Inorganic mercury is mainly excreted in the urine while organic (methylated) mercury proceeds via the bile into the gut. Measurements of urine or blood mercury are useful when the exposure is well above ‘average’ background levels.

DMSA Provocation test for Mercury
A challenge test for mercury (and other toxic metals) using 2,3-dimercaptosuccinic acid (DMSA). A baseline urine mercury measurement is made followed by a further urine mercury level 2.5 hours after oral ingestion of 15mg/Kg bodyweight of DMSA capsules. All mercury levels are corrected for creatinine. Results can be useful in assessing an individual’s overall body load of mercury and for monitoring toxic metal chelation therapy. The test is also suitable for assessing body loads of some other toxic metals.

[K - patient weight required, TAT 5]

Additional elements post DMSA
As add-ons to the above mercury provocation test.

Urine Toxic Elements Screen post DMSA
Doctor required to provide protocol. Elements measured as in Toxic Metals Screen opposite. The price includes the supply of DMSA @ 15mg/Kg bodyweight.

[K, 6HrU, TAT 5]

Post Arthroplasty Blood Toxic Metal Screen
Whole blood chromium, cobalt, manganese and molybdenum. [B, TAT 5]

Toxic Organic Chemicals Exposure Profile
See page 18.

Water - Metals Screen
A screen of 13 metals in water including: aluminium, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, lithium, manganese, mercury, nickel, selenium and uranium.

[Early morning tap water sample, TAT 7]
## Vitamins

Biolab offers a wide range of vitamin tests which are offered either as individual measurements or as broader profiles. Levels of fat soluble vitamins and ascorbic acid (C) are measured directly in blood serum. Vitamin D levels can also be measured using a finger-prick, blood-spot, sample.

Thiamine (B₁), riboflavin (B₂), niacin (B₃), pyridoxine (B₆) & Biotin (B₇) are assessed by functional methods achieved by measuring the activation of a red cell enzyme that is dependent upon an adequate concentration of a particular vitamin for full activity. There is a different enzyme for each of the B₁, B₂, B₃, B₆, & B₇ vitamins. The assays rely on normal metabolism of the vitamin to its native form and the presence of other non-vitamin cofactors.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Test Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Retinol)</td>
<td>[Y, D, NS, TAT 7]</td>
</tr>
<tr>
<td>B₁ (ETK Activation)</td>
<td>[Gn, 24, TAT 3]</td>
</tr>
<tr>
<td>B₂ (EGR Activation)</td>
<td>[Gn, 24, TAT 3]</td>
</tr>
<tr>
<td>B₆ (EGOT Activation)</td>
<td>[Gn, 24, TAT 3]</td>
</tr>
<tr>
<td>B₃ (Niacin status - NAD/NADP ratio)</td>
<td>[Gn, 24, TAT 4]</td>
</tr>
<tr>
<td>B₁₂ (“Active” holotranscobalamin)</td>
<td>[Y, Ext, TAT 4]</td>
</tr>
<tr>
<td>“Active” B₁₂ &amp; Methylmalonic Acid</td>
<td>[Y, NS, 24, Ext, TAT 15]</td>
</tr>
<tr>
<td>Beta-cryptoxanthin</td>
<td>[Y, D, NS, TAT 7]</td>
</tr>
<tr>
<td>Biotin B₇ (pyruvate carboxylase activation)</td>
<td>[Gn, TAT 4]</td>
</tr>
<tr>
<td>C (ascorbic acid)</td>
<td>[Y, NS, TAT 7]</td>
</tr>
<tr>
<td>Carotenes (alpha and beta)</td>
<td>[Y, NS, TAT 7]</td>
</tr>
<tr>
<td>D Profile (25-hydroxy D₃ &amp; D₂)</td>
<td>[Y, NS, 24, TAT 7]</td>
</tr>
<tr>
<td>Vitamin E (tocopherols) Profile</td>
<td>Alpha, gamma and delta-tocopherols. [Y, D, NS, TAT 7]</td>
</tr>
<tr>
<td>Vitamin E in Erythrocytes (red cells)</td>
<td>Alpha &amp; Gamma tocopherols reported in serum and erythrocytes [D, Y, NS, TAT 7]</td>
</tr>
<tr>
<td>Folate (red cell)</td>
<td>[P, Ext, TAT 4]</td>
</tr>
<tr>
<td>Vitamin K &amp; PIVKA</td>
<td>[Y, NS, 24, Ext, TAT 15]</td>
</tr>
<tr>
<td>Vitamin E (alpha &amp; gamma tocopherol)</td>
<td>See also Vitamin E Profile (above) [D, Y, NS, TAT 7]</td>
</tr>
<tr>
<td>Lutein</td>
<td>[D, Y, NS, TAT 7]</td>
</tr>
<tr>
<td>Lycopene</td>
<td>[D, Y, NS, TAT 7]</td>
</tr>
<tr>
<td>Methylmalonic Acid (serum)</td>
<td>[Y, Ext, TAT 15]</td>
</tr>
<tr>
<td>Methylmalonic Acid (24hr urine)</td>
<td>[24HrU, Ext, TAT 15]</td>
</tr>
<tr>
<td>Vitamin Profile</td>
<td>Retinol (A), alpha &amp; beta-carotenes, ascorbic acid (C), alpha and gamma-tocopherol (E) and functional thiamine (B₁), riboflavin (B₂) and pyridoxine (B₆) - see Functional B Vitamin profile for further details. [D, Y, Gn, 24, NS, TAT 7]</td>
</tr>
<tr>
<td>Vitamin Profile - Comprehensive</td>
<td>As above plus vitamin D, B₁₂ and RBC folate [D, Y, Gn, P, 24, NS, TAT 7]</td>
</tr>
<tr>
<td>Fat-Soluble Vitamin Profile</td>
<td>Vitamins A, E &amp; alpha &amp; beta-carotenes in serum. [Y, D, NS, TAT 7]</td>
</tr>
</tbody>
</table>

Functional B Vitamin Profile
Thiamine (B₁) - Erythrocyte transketolase activation (EGR), Riboflavin (B₂) - Erythrocyte glutathione reductase activation (EGR) and Pyridoxine (B₆) - Erythrocyte glutamic-oxaloacetic transaminase activation (EGOT).

Vitamin B12 & Folate Profile
serum B12 & folate, plus RBC folate)  

Other Tests and Profiles
Adrenal Stress Profile (saliva)
DHEAS plus morning, noon, evening and night cortisol levels  
See also Hormones - 24 hour urine adrenal profile.  

Adrenal Stress & Sex Hormones (dried urine)
DHEA-S, morning, noon, evening and night cortisol levels plus Estradiol (E2), Progesterone (Pg), Testosterone  
See also Hormones - 24 hour urine profiles.  
Price on application  

Albumin – serum  

Alkaline Phosphatase Bone - serum  

Allergy Screens (IgE)
The following IgE allergy panels are available. Full details available on our web site, or please contact us directly  

Food Panel (20 foods)  
Inhalant Panel (30 foods)  
Above two panels  
Total IgE (if required, Ext)  

Antioxidant Profile
Serum Cu, caeruloplasmin, vitamin E, RBC GSH-Px, serum β-carotene and superoxide dismutase.  

Antioxidant Activity - Total
An assessment of the combined activity of all the circulating antioxidants, reported as total and nutritional antioxidant activity.  

Antistreptolysis (‘Strep’) Antibodies
See also Streptococcus Antibody Profile  

Auto Antibody Screen  

Bile acids - total (serum)  

Biochemistry Profile
If submitted by post disregard potassium result. See also Haematology and Biochemistry Screen.  

Borrelia Antibodies for Lyme Disease
IgG & IgM  

Breath Hydrogen & Methane in the Assessment of Small Intestinal Bacterial Overgrowth (SIBO)
Hydrogen, and sometimes methane, are generated by bacterial action in the gut. The normal fasting level is low but increases are seen after the ingestion of fermentable carbohydrate. If bacterial action occurs in the stomach the hydrogen increase is detected in a matter of minutes.  
The normal rise after a test dose of a fermentable but non-absorbed sugar occurs two to three hours later when the carbohydrate reaches the colon. Lactulose is used as it is not absorbed but it is fermentable.  
An additional use of the test is in the investigation of lactose intolerance. Lactose is usually broken down and absorbed so that little or no increase in breath hydrogen
occurs after ingestion, but when it’s not absorbed an increase in breath hydrogen is observed.

Low doses of the test substances are used in order to avoid clinical symptoms as a result of the ingestion of a fermentable sugar.

**General method using lactulose for SIBO**
- The patient fasts for 14 hours prior to the test.
- Fasting breath hydrogen (and methane) are measured.
- 10gm of lactulose are taken in 200ml of water.
- Further breath samples are collected at 20 minutes intervals for 3 hours.

**Using lactulose for SIBO**  [K, TAT 3]

**Test for lactose intolerance**  [K, TAT 3]

**Test for fructose intolerance**  [K, TAT 3]

[C- Reactive protein]  [Y, 24, TAT 5]

[Copper Response Test]
Fasting serum is collected and a further sample is taken 1 hour after an oral loading dose of 220mg of zinc sulphate. An increase in copper is usually found. A reduction in copper response to zinc is seen in copper deficiency and some patients with chronic fatigue syndrome.

[Cortisol (serum - early morning recommended)]  [Y, ext, TAT 3]

[Creatinine (urine)]  [24HrU, Tat 3]

[D-Lactate (blood plasma)]  [Gy,Pa, TAT 5]

[D-Xylose Absorption Test]
[K, NF from 10pm the previous evening, TAT 5]

[DHEA sulphate]  [Y, Ext, TAT 7]

[Diamine oxidase (histamine intolerance)]  [Y, 24, Ext, TAT 5]

[DNA Oxidative Damage]
Measurement of 8-hydroxy-2'- Deoxyguanosine (8-OHdG) in urine providing a quantitative assessment of ongoing oxidative damage or stress in the body

[DNase B Antibodies (see also Streptococcus Antibody Profile)]  [Y, Ext, TAT 4]

Glutathione Peroxidase Profile
Glutathione peroxidase is an important antioxidant and an indicator of tissue selenium levels. Current concerns about low levels of selenium in the soil in the UK, together with concerns about modern agricultural methods, mean that application of this enzyme measurement may be appropriate in a wide variety of subjects. The profile includes red cell GSH-Px 1 & plasma GSH-Px 3

Female Hormone Profile (serum)
Includes the following hormones (measured in blood serum): LH, FSH, Prolactin, & oestradiol (17-Beta)
Please include day of menstrual cycle where applicable.

Gut Permeability Profile
Patients are given 3 grammes of polyethylene glycol (PEG), a harmless substance that is not metabolised, but which contains varying sized molecules. The PEG excreted in urine over the following 6 hours is measured over a range of molecular weights and a graphical absorption profile is reported highlighting any increased intestinal permeability, (or malabsorption), over a range of molecular weights.

Gut Permeability Profile Tests

Endomyseal antibodies (IgA)  [Y, Ext, TAT 5]

Fatty Acids Profile (erythrocytes)
A comprehensive screen of 32 erythrocyte fatty acids including omega-6, 3, 5, 7 and 9 fatty acids, saturated fats and trans fats, with key ratios also reported.

Female Hormone Profile (serum)

Food Sensitivity Profiles - IgG (93 foods)
Individuals with neurological, gastrointestinal, and movement disorders often suffer from IgG food allergies. These patients may continue to eat offending foods unaware of their potential effects. IgG antibodies provide long term resistance to infections and have a much longer half life than the traditional IgE allergy. Symptoms may occur hours or days after the offending food has been eaten. The 93 foods tested in the IgG Food Allergy Test plus Candida can identify problem food so it can be eliminated from the patient’s diet.

Samples are referred to Great Plains Laboratory for analysis.

[ Finger-prick kits available on request or Y, Ext, TAT 12-15 ]

Fructose Intolerance - see Breath Hydrogen & Methane tests.

Gamma-Glutamyl Transferase (GGT)

Gliadin antibodies (IgA + IgG) [Y, Ext, TAT 5]

Glucose Challenge/Tolerance Tests
2.5 hour (6 samples)
5 hours (9 samples)
Note: Should be started before 10:30am

Glutathione RBC [Gn, 24, TAT 4]
[B,Y,Gn,2xP, NS, NF 4 hours, TAT 7-10]

Health Risk profile - Extended
As above but also including vitamin D, vitamins B1, B2, B6 and B3, biotin and homocysteine.

[Additional sample requirements:  Gn, Y, kit required for homocysteine, TAT 7-10]

Helicobacter Pylori Breath test  [K. Ext, TAT 5]

Helicobacter Pylori Antibodies  [Y, Ext, TAT 5]

Helicobacter Pylori Antigen  [random stool, Ext, TAT 5]

Histamine (plasma or urine)  [P / MSU, TAT 5]

See also Diamine Oxidase for histamine intolerance.

Hepatic Detoxification Profile
The body continually attempts to eliminate chemical toxins through enzymatic processes in the liver, this profile includes urinary D-glucaric acid, a by product of Phase I detoxification which can indicate chemical exposure to over 200 chemicals, and mercapturic acids which are end products of Phase II detoxification.

[EMU, Ext, TAT up to 15]

Homocysteine - plasma
Biolab provides a test kit which includes an enzyme inhibitor that immediately stabilises the homocysteine level avoiding the need for centrifuging and freezing of the plasma

[K - patient should ideally consume a protein containing meal 3-4 hours prior to the sample collection, TAT 7]

HORMONE Profiles:
We offer a range of hormone testing options in addition to serum levels, and the method chosen depends mainly on patient/practitioner preference (all methods are analytically equally reliable and are provided by Biolab to enhance choice for patient convenience). We refer blood spot & saliva samples to ZRT Laboratories, dried urine samples to Precision Analytical and 24 hour urine samples to Meridian Valley Clinical Laboratories (all in the USA). Further details of test availability is listed below and samples reports can be viewed on the Biolab web site:

Blood Spot and Urine Hormone Profiles
Referred to ZRT laboratories

Saliva Adrenal Profile
DHEA-S (DS), C x 4

Male Saliva Profile III
E2, Pg, T, DS & Cx4

Male Profile I (blood-spot)
E2, T, PSA, SHBG, DS, C

Male Profile II (blood-spot)
E2, T, PSA, SHBG, DS, C, TSH, fT3, fT4, TPO

Comp Male Profile I (saliva & blood-spot)
SALIVA: E2, T, DS, Cx4 BLOOD SPOT: PSA, TSH, fT3, fT4, TPO

Comp Male Profile II (saliva & blood-spot)
SALIVA: Cx4 BLOOD SPOT: E2, T, DS, SHBG, PSA, TSH, fT3, fT4, TPO

Female Saliva Profile III
E2, Pg, T, DS & Cx4

Female Profile I (blood-spot)
E2, Pg, T, SHBG, DS, C

Female Profile II (blood-spot)
E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPO

Comp Female Profile I (saliva & blood-spot)
SALIVA: E2, Pg, T, DS & Cx4 BLOOD SPOT: TSH, fT3, fT4, TPO

Comp Female Profile II (saliva & blood-spot)
SALIVA: Cx4 BLOOD SPOT: E2, Pg, T, SHBG, DS, TSH, fT3, fT4, TPO

Hormone Trio (saliva or blood-spot)
E2, Pg, T
Hormones (dried urine, “DUTCH” tests):
Urine is collected on to a series of small absorbent patches over a 24 hour period. The patches are allowed to air-dry before being returned for analysis. Samples are stable for up to 3 weeks and can also be stored frozen:

Adrenal Hormones & Metabolites Profile
Sex Hormone Profile
Comprehensive Sex and Adrenal Hormones Profile

[urine samples collected on absorbent patches, K, Ext, TAT up to 15]

24 hour Urine Hormones (referred to Meridian Valley Clinical Laboratories, USA):
Hormone levels vary throughout the day so fluctuations may be missed in serum or saliva samples and 24 hour urine levels allow the quantification of the production of hormones and their metabolites over an entire day. Reference ranges are reported for females at different stages of the monthly cycle and post-menopause and separately for males.

For sample reports please search our web site for “Hormones”
Sex Hormone Profile [24hrU, Ext, TAT 14]
Comprehensive Hormone Profile
Includes sex and adrenal hormones
[24hrU, Ext, TAT 14]
Comprehensive Hormone Plus
As above plus thyroid hormones (T4 & T3)
[24hrU, Ext, TAT 14]

Comprehensive Hormone Plus with Human Growth Hormone
[24hrU, Ext, TAT 14]
See our web site for sample reports. 24 hour urine test kits available on request for all of the above panels.

IgE (total) [Y, Ext, TAT 5]
IgG Food Sensitivity Profile (see food sensitivity profiles above). See also Allergy Screens (IgE)

Immunoglobulins (IgG, IgA and IgM)
[Y, Ext, TAT 5]

Indicans (urine, qualitative)[EMU, TAT 3]

Insulin (Pa, Y, Ext, TAT 3)

Kryptopyrroles (urine, semi-quantitative)
Note: Add an eighth of a teaspoon of ascorbic acid to the urine sample as a preservative unless using a Biolab supplied test kit. Sample must also be protected from light.
[K, MSU, D, TAT 5]

Lactate Dehydrogenase (LDH)
[Y, TAT 5]

Lactate Dehydrogenase - Oxidised
(Pa, Y, TAT 10)

Lactose Absorption Test
(see also breath hydrogen & methane tests)
[K, NF from midnight the previous evening, TAT 3]

Lipids Profile [Y, NF for 14 hours, Ext, TAT 3]

Liver Function Tests
Includes: Bilirubin, gamma glutamyl transferase (GGT), alkaline phosphatase (ALP), alanine aminotransferase (ALT) & aspartate aminotransferase (AST), albumin and total protein.
[Y, Ext, TAT 3]

Luteinising hormone (serum) [Y, Ext, TAT 5]

Lyme Disease - see Borrelia antibodies

Magnesium Loading/Retention Test
A 24-hour urine magnesium level is measured, before and after an intramuscular magnesium load. There is increased retention of magnesium when a deficiency exists.

The patient brings the first 24-hour urine sample to the laboratory, has the magnesium injection and then proceeds to collect the second 24-hour urine sample.
[Pa, 2 x 24HrU, TAT 4]

Male Hormone Profile (serum)
FSH, LH, Testosterone, Free Androgen Index, Prolactin, SHBG
**MELISA tests for metal sensitivities**

Individuals with metal hypersensitivity may have numerous symptoms associated with an overactive immune system, including chronic fatigue, joint and muscle pain, cognitive impairment, depression, headaches, fibromyalgia and skin rashes. MELISA® is a scientifically proven and clinically validated blood test that detects type-IV allergy to metals (see www.melisa.org for further details).

Samples for MELISA tests are collected at Biolab and couriered to a MELISA laboratory in Germany. Over 30 different metals can be tested, along with casein, gluten and Lyme Borreliosis.

Fees are as follows (please contact the laboratory for a full MELISA price list):

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Fee (excluding courier)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single metal</td>
<td>£25.00</td>
</tr>
<tr>
<td>Ten metals</td>
<td>£25.00</td>
</tr>
<tr>
<td>Amalgam Profile</td>
<td>£25.00</td>
</tr>
<tr>
<td>Amalgam, Gold &amp; Root Fillings Profile</td>
<td>£25.00</td>
</tr>
<tr>
<td>Titanium Implant profile</td>
<td>£25.00</td>
</tr>
</tbody>
</table>

Please enquire for details of further panels or bespoke lists of metals to be tested.

Further charges are made for the overnight courier to the MELISA laboratory (£25.00) and the Biolab phlebotomy/sample handling fee of £20.00.

**Menopause Hormone Profile (serum)**

FSH, LH, Oestradiol (17-Beta), TSH, FT4

**Methylation Profile (plasma)**

This test assesses metabolism of the essential amino acid methionine (Met). Methionine is paramount in two metabolic processes; Methionine is paramount in two metabolic processes; (1) transmethylaiton that is critical for the methylation of hundreds of important molecules such as DNA, RNA, proteins, neurotransmitters and membrane phosphatidylcholine, and (2) transsulfuration that leads to the biosynthesis of cysteine and hence glutathione, both of which have many important protective/detoxification functions.

**Methylinomalonic acid** (see vitamin section)

**Minerals** - see page 7

**MTHFR mutations**

**Blood** (C677T)  
**[P, Ext, TAT 7]**

**Saliva** (C677T & A1298C)  
*[saliva, K, Ext, TAT 10-15]*

**Nagalase**  
[Y serum / P plasma frozen, Pa, Ext, TAT 10]

**NTX - type 1c Telopeptides**

Urine indicator of bone loss - see also Osteoporosis Screens

**[MSU, EXT, TAT 5]**

**Oestradiol (Serum)**  
*[Y, Ext, TAT 3]*

**Organic Acids - Urine**

Organic Acid molecules in the urine are by-products of human metabolism providing non-invasive markers of gastrointestinal dysbiosis (bacterial and yeasts), oxalate metabolism, Krebs cycle metabolism, neurotransmitter function, ketone and fatty acid oxidation, detoxification, amino acid metabolism and in some cases indicators of nutritional status.

We refer samples for organic acid analysis to Dr William Shaw at Great Plains Laboratory in the USA (turnaround

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**KEY:**  
Becton Dickinson Vacutainer tubes:  
[B] Blue – trace element free EDTA,  
[Gn] Green - heparin,  
[Sy] Grey—fluoride oxalate,  
[Y] Yellow/Gold—SST Gel,  
[P] Lavender—EDTA,  
[24] Sample MUST reach the laboratory within 24 hours,  
[D] Protect sample from light,  
[EMU] - Early morning mid-stream urine sample,  
[Ext] Referred to external laboratory,  
[MSU] - Mid-stream urine sample,  
[6/24HrU] 6 or 24 hour urine collection,  
[NF] Fasting for stated time period (consume water only),  
[NS] No nutritional supplements for 24hrs before test,  
[Pa] Patient must attend the laboratory,  
[TAT] Average turnaround time.
time is typically 10-14 working days).

**Microbial Organic Acids** [EMU, Ext, TAT 14]
(20 gastrointestinal dysbiosis organic acids).

**Microbial Organic Acids plus Phospholipase A2 (PLA2)** [EMU, Ext, TAT 14]

**Neuro-Biogenic Amine (neurotransmitter) Profiles**
Neuro-biogenic amines are produced from essential aromatic amino acids and secreted from pre-synaptic neurons into the synapse between nerve cells to stimulate receptors on postsynaptic neurons. While circulating levels of neuro-biogenic amines and metabolites may have a variety of sources, urinary levels primarily reflect activity of the peripheral and enteric nervous systems. Up to 20 percent of urinary neurotransmitters are estimated to originate in the central nervous system. The comprehensive profile includes 15 markers and the basic profile includes 7 markers:

- **Comprehensive Neuro-Biogenic Amine Profile**
- **Basic Neuro-Biogenic Amine Profile** [EMU/24hr, Ext, TAT 14]

**Organic Acids Profile (73 compounds)** [EMU, Ext, TAT 14]

**Organics Acids Profile (as above) with - phospholipase A2 (PLA2)** [EMU Ext, TAT 14]

For both of the above organic acid profiles: 10 mL of first morning urine (i.e. a concentrated urine sample) before food or drink is suggested. Patient should avoid apples, grapes (including raisins), pears, cranberries and their juices for 24 hours prior to specimen collection.

For sample reports and an interpretive guide please search the Biolab web site for "Organic Acids".

**Osmolality (urine)** [MSU, TAT 5]

**Osteoporosis profile**
Total and bone alkaline phosphatase and acid phosphatases are measured to assess the balance between bone formation and bone resorption. Calcium and phosphorus are measured in both urine and blood together with tests to assess the status of a range of nutrients essential to bone metabolism. The profile complements rather than replaces bone mineral density measurement.

[B, 2 x Y,Gn, EMU - 2nd void, NS, TAT 7]

**Osteoporosis Urine Elements Profile**
See page 7

**“PANDAs” Profile**
see Streptococcus Antibody Profile

**Paraoxonase**
An antioxidant enzyme associated with atherosclerosis risk [included in Health Risk Profile].

[Y or Gn, 24, TAT 7]

**Peptides - Gluten & Casein Peptides (urine)**
Incomplete digestion of gluten and casein proteins results in intestinal absorption of polypeptides (small protein fragments) that can become biochemically active triggering a range of symptoms, in particular gastrointestinal, neurological, and neuro-developmental disorders. The excretion of the polypeptides casomorphin or gliadorphin in the urine indicate milk or gluten intolerance.

Most people who have food allergies to milk and/or wheat also have problems with peptides from these foods interacting with brain biochemistry causing opiate-like effects.

*10 mL of first morning urine before food and drink is preferred. Patients need to be consuming gluten and casein for 5-7 days prior to providing their sample. The patient must discontinue soy proteins one week prior to collection of specimen (soy bean oil and soy lecithin are considered acceptable).*

Samples are referred to The Great Plains Laboratory (USA) [Ext, TAT 14].

**Phospholipase A2 (PLA2)**
PLA2 is elevated in a wide range of inflammation-related disorders and is considered a good marker for increased risk of developing or worsening of inflammatory conditions. PLA2 levels are measured in an early morning urine specimen. Request can be added to Organic Acid profiles (full or microbial) at a reduced rate (see Organic Acids).

[EMU, Ext, TAT 14]
Porphyrids Profile  [EMU, Ext, TAT 14]
Progesterone  [Y, Ext, TAT 3]
Prolactin  [Y, Ext, TAT 3]
Reverse T3  see also “Thyroid Profiles” [Pa, Ext, TAT 5]

Rheumatology profile
FBC, ESR, Uric Acid, Rheumatoid factor, Anti CCP Antibodies (RF), C Reactive Protein
[Y, P, Ext, TAT 4]

Sex Hormone Binding Globulin (SHBG)
[Y, Ext, TAT 3]

Stool Analyses
The Comprehensive Stool Analysis with Parasitology may be used to assess digestive and absorptive functions, the presence of opportunistic pathogens and to monitor the efficacy of therapeutic remediation of GI disorders. The status of beneficial and imbalanced commensal bacteria including Clostridium species, pathogenic bacteria, yeast/fungus and parasites can be assessed. Precise identification of pathogenic species and susceptibility testing (both natural and pharmaceutical) is provided.

The efficiency of digestion and absorption is provided by the measurement of the faecal levels of elastase (pancreatic exocrine sufficiency), muscle and vegetable fibers, carbohydrates, and steatocrit (% total fat). Markers of inflammation (lysozyme, calprotectin and lactoferrin, WBC & mucus) are provided along with secretory IgA as an indicator of immune status in the gastrointestinal tract.

Stool samples are referred to Doctor’s Data in the USA with a typical turnaround time of 12-15 working days.

Comprehensive Stool Analysis with Parasitology
2 day samples
3 day samples

Comprehensive Parasitology in stool
2 day samples
Stool - Chemistry only
Stool C. Difficile DNA
Stool Clostridium culture
Stool Microbiology
Stool Secretory IgA
[K, Ext, TAT for all stool tests up to 15 days]

Streptococcus Antibody Profile
Antistreptolysis (‘Strep’) and DNaseB antibodies. Also referred to as “PANDAs” profile (Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal Infections)
[Y, ext, TAT 7]

Sulphites (urine)  [EMU, TAT 5]
A functional test of molybdenum status.

Superoxide Dismutase  [Gn, TAT 3]
A functional test for copper status and an important antioxidant enzyme.

Tartrate-resistant acid phosphatase (TRAP)  [Y, TAT 5]

Testosterone (serum)  [Y, Ext, TAT 3]

Thyroid profile 1
FT4 and TSH  [Y, Ext, TAT 3]

Thyroid profile 2
FT4, TSH & thyroid antibodies  [Y, Ext, TAT 4]

Thyroid profile
FT4, TSH & FT3  [Y, Ext, TAT 3]

Thyroid Profile (Comprehensive)
FT4,TSH, Thyroid Antibodies, Free T3 and Total T4  [Y, Ext, TAT 4]

Free T₄ [Y, Ext, TAT 5]
Total T₄ [Y, Ext, TAT 5]
Free T₃ [Y, Ext, TAT 5]
Total T₃ [Y, Ext, TAT 5]
Reverse T₃ [Pa, Y, Ext, TAT 10]

Thyroid Stimulating Hormone (TSH)
[Y, Ext, TAT 3]

Thyroid antibodies [Y, Ext, TAT 5]

Tissue transglutaminase (IgA)
[Y, Ext, TAT 3]

Toxic Organic Chemicals Exposure Profile

Screens for 9 distinct markers of exposure to over 160 toxic compounds including organophosphate pesticides, phthalates, benzene, xylene, vinyl chloride, pyrethrin, insecticides and others. Also includes Tiglyglycine (TG) a marker for mitochondrial diseases resulting from mutations of mitochondrial DNA caused by exposure to toxic chemicals, infections, inflammation and nutritional deficiencies.

If requested with a Great Plains Laboratory full Organic Acids Profile the fee is reduced.
[EMU, Ext, TAT 10-14]

Above also available with Glyphosate (at additional charge)

Trimethylamine (TMAU)
[EMU, Ext, TAT 10]

Urine Microscopy, culture & sensitivity
[MSU, Ext, TAT 3]

Viral Disease (Antibody) Profile

Influenza A CFT CMV, Influenza B CFT HSV 1, Measles, IgG
HSV 2, Measles IgM, Mumps IgG, Mumps IgM, Mycoplasma pneumonia, Adenovirus, Chlamydia, Q fever.
[2 x Y, Ext, TAT 4]

Zinc Challenge Tests

Plasma zinc levels pre and post oral 220mg zinc sulphate.
1.5 hour (2 samples) [K]
3.0 hour (7 samples) [K]
This guide to recommended nutritional tests by disease, lists those tests that are justified in current medical literature (basic profiles) and tests of a more specialist nature (advanced profiles) which may be appropriate for some patients. These are guidelines only and individual requirements will vary. Practitioners are welcome to call Biolab to discuss specific test requirements.

<table>
<thead>
<tr>
<th>Basic profile</th>
<th>Advanced profile (additional tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NEUROLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>Neuropathy</td>
<td>Vitamins B1,B3,B6,B12, folate, essential fatty acids, plasma mineral profile with RBC magnesium, antioxidants</td>
</tr>
<tr>
<td></td>
<td>Blood toxic metals screen</td>
</tr>
<tr>
<td>Dementia</td>
<td>AS ABOVE (also consider homocysteine)</td>
</tr>
<tr>
<td></td>
<td>Blood toxic metals screen</td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td>Vitamins B1, B12, essential fatty acids, superoxide dismutase, plasma mineral profile with RBC Mg</td>
</tr>
<tr>
<td></td>
<td>Also consider MELISA mercury sensitivity</td>
</tr>
<tr>
<td><strong>CARDIOLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>Coronary heart disease and hyperlipidaemia</td>
<td>Vitamins D, B6, B12 &amp; folate, essential fatty acids, copper, chromium, RBC magnesium, urine iodine, superoxide dismutase, homocysteine, coenzyme Q10, paraoxonase</td>
</tr>
<tr>
<td></td>
<td>Thyroid Function Profile (FT4, TSH &amp; thyroid antibodies)</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>Vitamins D, B1, GSH-Px, RBC magnesium &amp; plasma potassium, urine iodine &amp; coenzyme Q10</td>
</tr>
<tr>
<td></td>
<td>Thyroid Function Profile (FT4, TSH &amp; thyroid antibodies) &amp; superoxide dismutase</td>
</tr>
<tr>
<td>Cardiac arrhythmias</td>
<td>Vitamins B1, Plasma mineral profile with RBC magnesium, Essential fatty acids</td>
</tr>
<tr>
<td></td>
<td>Blood mercury</td>
</tr>
<tr>
<td><strong>GASTROENTEROLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>Steatorrhoea and malabsorption</td>
<td>Fat soluble vitamins, essential fatty acids, serum profile with RBC Mg, GSH-Px</td>
</tr>
<tr>
<td></td>
<td>Gut Permeability Profile</td>
</tr>
<tr>
<td>Burning mouth syndrome / Recurrent mouth ulceration</td>
<td>Vitamins B2, B3, B6, B12 and Folate</td>
</tr>
<tr>
<td></td>
<td>Coeliac Profile (gluten sensitivity screen)</td>
</tr>
<tr>
<td>Post Bariatric Surgery (recommended annual screening) - reference available on request</td>
<td>Haematology &amp; Biochemistry Profile, ferritin, parathyroid hormone, vitamins A, D, B12 &amp; folate, plasma zinc, copper and selenium (mineral screen).</td>
</tr>
<tr>
<td><strong>PSYCHIATRY</strong></td>
<td></td>
</tr>
<tr>
<td>Alcohol excess</td>
<td>Liver function tests, vitamins D, C, B1, B3, folate, plasma mineral profile with RBC magnesium, urine iodine essential fatty acids, GSH-Px</td>
</tr>
<tr>
<td>Major Psychosis: depression, schizophrenia and manic depression</td>
<td>Vitamins D, B1, B3, B12, folate, C, essential fatty acids, plasma mineral profile with RBC Mg</td>
</tr>
<tr>
<td></td>
<td>Kryptopyrroles &amp; Histamine</td>
</tr>
<tr>
<td>Anorexia Nervosa</td>
<td>Vitamin B1, B12, folate, plasma mineral profile with RBC magnesium, urine iodine, essential fatty acids</td>
</tr>
</tbody>
</table>
### Suggested Disease Related Test Profiles continued

<table>
<thead>
<tr>
<th>Condition</th>
<th>Basic profile</th>
<th>Advanced profile (additional tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PAEDIATRICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor growth &amp; poor appetite</td>
<td>Plasma mineral profile with RBC magnesium, urine iodine, vitamins A, B1, Haematology Profile, Ferritin, vitamins B12 &amp; D</td>
<td>Gut Permeability Profile Coeliac Profile (gluten sensitivity screen)</td>
</tr>
<tr>
<td>ADHD and other conditions</td>
<td>Vitamins B1, B3, C, B12, folate, essential fatty acids, plasma mineral profile with RBC Mg, urine iodine &amp; ferritin</td>
<td>Vitamin B6, kryptopyrroles, histamine</td>
</tr>
<tr>
<td><strong>RHEUMATOLOGY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Existing Biolab Osteoporosis Screen</td>
<td></td>
</tr>
<tr>
<td>Inflammatory arthritis</td>
<td>Essential fatty acids, Superoxide dismutase, zinc/plasma mineral profile with RBC Mg, GSH-Px, vitamins B2, D &amp; ferritin</td>
<td></td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>Vit B1, RBC Mg, GSH-Px, zinc &amp; vitamin D</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER CONDITIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent or severe infection</td>
<td>Vitamins B1, A, C, plasma zinc &amp; copper, Essential fatty acids, GSH-Px, ferritin &amp; vitamin D</td>
<td>Superoxide dismutase</td>
</tr>
<tr>
<td>CFS/ME</td>
<td>Vitamins B1, B3, C, D, B12, folate, essential fatty acids, Plasma mineral profile with RBC magnesium, urine iodine, GSH-Px, coenzyme Q10, ferritin (low or high)</td>
<td>Superoxide dismutase</td>
</tr>
<tr>
<td>Severe drug/nutrient interactions</td>
<td>Vitamin C, B2, B6, zinc, essential fatty acids, GSH-Px</td>
<td>Superoxide dismutase</td>
</tr>
<tr>
<td>Degenerative eye conditions</td>
<td>Plasma zinc, essential fatty acids, Vitamin Profile, lutein, lycopene, GSH-Px,</td>
<td>Superoxide dismutase</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Glycocyalted haemoglobin (HbA1c), Vitamins B1, C, D, plasma mineral profile with RBC magnesium, urine iodine, essential fatty acids</td>
<td>Vitamins B3 &amp; B6</td>
</tr>
<tr>
<td>Fertility problems</td>
<td>Essential fatty acids, Plasma mineral profile with RBC magnesium, urine iodine, GSH-Px, toxic metals screen/Lead, vitamins B1, &amp; B3</td>
<td>Superoxide dismutase</td>
</tr>
<tr>
<td>?Early menopause</td>
<td>Ferritin, haematology profile [and B12 if needed]</td>
<td>RBC Mg</td>
</tr>
</tbody>
</table>

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20
Sample reports
(see the Biolab web site for a wider selection of sample reports)
### Pathology request form continued (please remove or copy)

**Sample date & time:**

**Patient name:**

**Trace and toxic metals**

- [ ] Hair analysis - (please complete a yellow Hair Analysis request form)
- [ ] Plasma element profile (Ca, Cr, Cu, Fe, Mg, Mn, Se, Zn & red cell Mg)
- [ ] Blood toxic elements screen (16 elements)
- [ ] Blood toxic metals - Industrial (Pb, Mn, Cd)
- [ ] 6 hour urine toxic elements screen (18 elements) (urine volume = ____ ml)
- [ ] Osteoporosis urine mineral screen (Ca, Mg, P, Zn)
- [ ] Post arthropathy blood toxic metal profile (Cr, Co, Mn, Mo)
- [ ] DMFA mercury provocation test (pre-arrange with laboratory)
- [ ] Water toxic element profile (13 elements)

Please tick boxes for individual test: (not available)

<table>
<thead>
<tr>
<th>Trace and Toxic Metals</th>
<th>Samples collected by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Trace and Toxic Metals</th>
<th>Samples collected by:</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Vitamins</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Profiles</td>
</tr>
<tr>
<td>[ ] Vitamin profile (A, C, E, carotenes, B₁, B₂, B₆)</td>
</tr>
<tr>
<td>[ ] Fat soluble vitamin profile (A,E, carotenes)</td>
</tr>
<tr>
<td>[ ] Functional blood B vitamins (B₁₂, B₆, B₉)</td>
</tr>
<tr>
<td>[ ] Vitamin B₁₂ (active B₁₂) and methylmalonic acid</td>
</tr>
<tr>
<td>[ ] Vitamin D profile (25-hydroxy vitamin D2 and D3)</td>
</tr>
<tr>
<td>[ ] Vitamin E profile</td>
</tr>
<tr>
<td>[ ] Alpha, delta &amp; gamma tocopherol</td>
</tr>
<tr>
<td>[ ] Vitamin K1 and PIVKA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Direct Measurements</th>
<th>Functional Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Vitamin A (serum)</td>
<td>[ ] B₁</td>
</tr>
<tr>
<td>[ ] Beta carotene (serum)</td>
<td>[ ] B₂</td>
</tr>
<tr>
<td>[ ] Vitamin C (serum)</td>
<td>[ ] B₉</td>
</tr>
<tr>
<td>[ ] Vitamin E (serum) - alpha &amp; gamma tocopherol</td>
<td>[ ] B₁₂ (niacin)</td>
</tr>
<tr>
<td>[ ] Lycopene (serum)</td>
<td>[ ] Biotin</td>
</tr>
<tr>
<td>[ ] Lutein (serum)</td>
<td></td>
</tr>
<tr>
<td>[ ] Beta-cryptoxanthin</td>
<td></td>
</tr>
<tr>
<td>[ ] Coenzyme Q₁₀ (serum)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provenances</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Amino acids (24 hour urine volume = ____ ml)</td>
</tr>
<tr>
<td>[ ] Antioxidant profile</td>
</tr>
<tr>
<td>[ ] Fatty acids profile (red cells)</td>
</tr>
<tr>
<td>[ ] Gut permeability profile (6 hour urine volume = ____ ml)</td>
</tr>
<tr>
<td>[ ] Health risk profile (3hr fast &amp; no nutritional supplements for 24hrs)</td>
</tr>
<tr>
<td>[ ] Health risk profile - Extended (3hr fast &amp; no nutritional supplements for 24hrs)</td>
</tr>
<tr>
<td>[ ] Osteoporosis screen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functional Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Food panel (20 foods)</td>
</tr>
<tr>
<td>[ ] Inpatient panel (30 inpatients)</td>
</tr>
<tr>
<td>[ ] Total IgE</td>
</tr>
</tbody>
</table>

**Other tests**

- [ ] Albumin
- [ ] Antioxidant activity (total & nutritional)
- [ ] Bile acids (total)
- [ ] C-Reactive protein
- [ ] Caeruloplasmin
- [ ] Creatinine (urine)
- [ ] D-Lactate
- [ ] Fluoride (urine / water sample)
- [ ] Glucose (fasting? Yes / No)
- [ ] Glutathione (RBC)
- [ ] Glutathione peroxidase (RBC & plasma)
- [ ] Glutathione reductase (RBC)
- [ ] Glycylcysteinated haemoglobin (HbA1c)
- [ ] Haemoglobin

**Challenges**

- [ ] Copper response test
- [ ] D-xylene (5 hr urine volume = ____ ml)
- [ ] 2% hour glucose (overnight fast)
- [ ] 5 hour glucose (overnight fast)
- [ ] 2½ hour lactose (overnight fast)
- [ ] 1½ hour zinc (overnight fast)
- [ ] 3 hour zinc (overnight fast)

**Tests requiring a special appointment**

- [ ] Breath hydrogen & methane tests (14 hour fast): Standard test for small intestinal bacterial overgrowth (SIBO) (3 hours)
- [ ] Lactose intolerance (3 hours)
- [ ] Fructose intolerance (3 hours)

**Other Biolab tests - please specify:**

- [ ] PTO for investigations referred to external laboratories

**Key:** * Patients are advised not to take nutritional supplements for 24 hours before tests

Please send me: [ ] More of these forms [ ] Hair mineral analysis forms [ ] List of disease related test profiles

(2005)
Biolab

Hair Analysis request form (please remove or copy)

Request for Hair Mineral & Toxic Element Analysis

<table>
<thead>
<tr>
<th>Patient</th>
<th>Referring clinician</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong> Mr / Mrs / Master / Miss / Other</td>
<td><strong>Name</strong></td>
</tr>
<tr>
<td><strong>Forenames</strong></td>
<td><strong>Address</strong></td>
</tr>
<tr>
<td><strong>Surname</strong></td>
<td>****</td>
</tr>
<tr>
<td><strong>Date of birth</strong></td>
<td>****</td>
</tr>
<tr>
<td><strong>Sex: M / F / Pregnant? No / Yes / Weeks</strong></td>
<td><strong>Telephone</strong></td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td><strong>Fax</strong></td>
</tr>
<tr>
<td></td>
<td><strong>E-mail</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Your reference</strong></td>
</tr>
<tr>
<td></td>
<td><strong>GP's name and address</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Telephone</strong></td>
</tr>
<tr>
<td></td>
<td><strong>E-mail</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Last Biolab reference</strong></td>
</tr>
</tbody>
</table>

In the event of a referral by a non-medical practitioner please include practitioner's and GP's details

---

**Sample details:**

- **Hair sample date:**
- **Natural hair colour:**
- **Patient's height:**
- **Brand of shampoo:**
- **Patient's weight:**
- **Brand of conditioner:**

In the last three months has the hair been (if yes, tick box and provide date):
- **Bleached:**
- **Date:**
- **Highlighted:**
- **Date:**
- **Permed:**
- **Date:**
- **Coloured/ tinted:**
- **Date:**

**Does the patient:**
- Drink alcohol? □
- Smoke? □
- Take mineral supplements? □
- Use other medications? □

---

**Instructions for collection of hair sample:**

If the hair has been permed, bleached, or otherwise permanently coloured none of the treated hair should be included in the sample for analysis. If the treatment has been carried out recently, a period of 12 weeks should be allowed to elapse before sampling. The patient may continue to take nutritional supplements, which will not distort the hair results.

Hair should be cut from the back of the head, or rope of the neck, as close to the scalp as possible. At least 0.5g of hair is required, which is about one heaped tablespoon full. Only hair up to 1½” (4cm) from the scalp can be used. Please allow this when the hair is long by sending in a larger sample, for example 2 tablespoons-full of hair.

Place the hair sample in a plain paper envelope, seal and label clearly with the patient's name, date of birth and address. Fully complete this request form and attach the hair sample to it. Return to Biolab at the address below by First Class post.

---

**ACCOUNT TO:**
- **CLINICIAN**
- **PATIENT** (please include cheque or card details below)

Patients are requested to settle their account at the time of testing. For postal samples please include a cheque (made payable to Biolab Ltd) or your debit/credit card details:

- **Cardholder's name (as it appears on the card):**
- **Card number:**
- **Expire date:**
- **CVC (3 digits from reverse of card):**

**Signature:**

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If you have any questions please do not hesitate to contact us.

**Medical Director:** Dr Stephen Davies MA BM BCh FACN  
**Laboratory Director:** Dr Nicholas Miller PhD FRCPath

- **Biolab**  
- The Stone House  
- 9 Weymouth Street  
- London  
- W1W 6DB  
- U.K.  
- **Tel:** (+44) 020 7636 5859/5895  
- **Fax:** (+44) 020 7589 3918  
- **E-mail:** info@biolab.co.uk