BARC

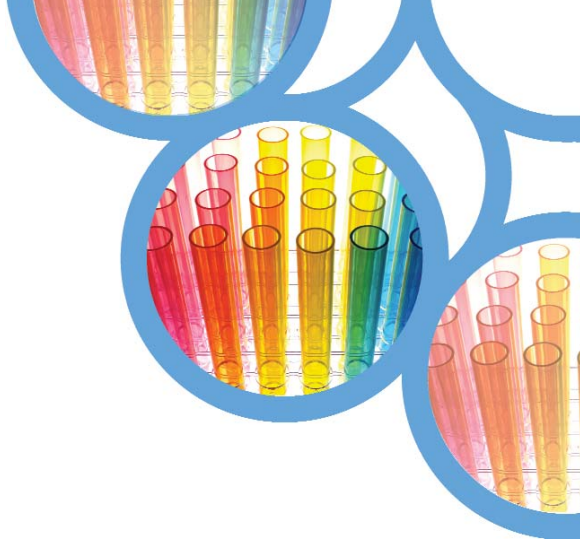
Global Central Laboratory

WHERE TECHNOLOGY MEETS EXPERTISE

YOUR SOLUTION-DRIVEN PARTNER

www.barclab.com

YOUR SOLUTION-DRIVEN PARTNER



CONTENT

ABOUT BARC

Where Technology meets Expertise

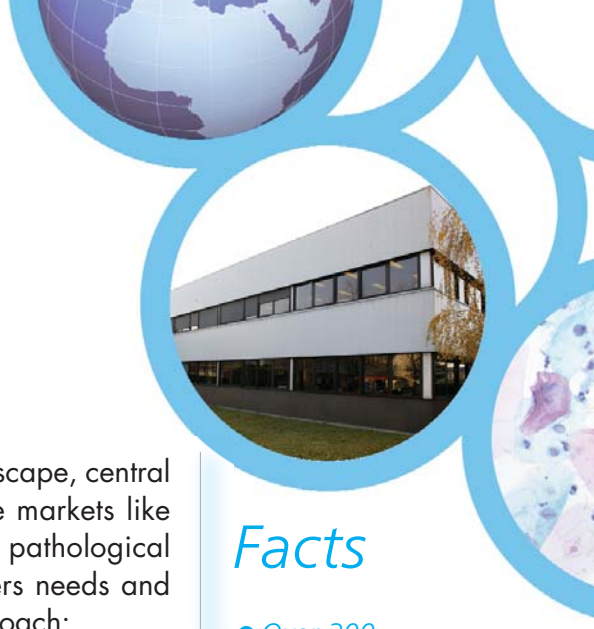
For over 30 years, BARC provides Pharma companies and Biotechs with central lab service in routine and specialized testing in clinical pathology, histo-cytopathology and genetics.
BARC laboratories have a routine medical clinical pathology activity, thus ensuring that the tests offered are also performed on a daily basis for diagnostic purposes, patients stratification, staging, therapeutic indication and follow-up.
Equipped with cutting-edge technologies, BARC's experts are specialists in their respective medical fields and deliver more than testing: at BARC, they act as genuine partners for our customers and are fully integrated in their R&D processes, providing a critical advantage in the ever more complex clinical trials involving specialized testing.

Extensive testing portfolio

BARC 's testing portfolio includes over 2.500 tests from routine to highly specialized companion tests. Proven technology transfer capabilities make BARC a partner of choice for demanding clinical trials involving the latest technologies or new substrates. Flexibility and commitment of our experienced and dedicated teams are the cornerstones of BARC's offer for providing its customers with seamless processes and high added value services.

BARC is a part of Cerba European Lab

Cerba European Lab is a European leader in clinical pathology ranging from first intention to highly specialized tests including central laboratory facilities for clinical trials.
Founded in 2007, Cerba European Lab harnesses the synergies of Laboratoire Cerba specialized laboratory and of over 300 local clinical pathology laboratories, serving millions patients.
With more than 4,000 collaborators focused on the same goal of providing patients, physicians and pharmaceutical companies with the best healthcare service, Cerba European Lab is highly commited to setting up the most demanding quality standards worldwide.
Cerba European Lab's global presence also extends through the EMEA and Asian markets, with local representatives meeting the same quality standards.



Customer-focus as a priority

At BARC, we fully realize that in the fast changing pharma landscape, central labs take on a new, more proactive, dimension. Competitive markets like oncology focus on test-orientated therapeutics where clinical pathological expertise is paramount. At BARC, we understand our customers needs and our skills help empowering their R&D with a personalized approach:

- Technology transfer capabilities for fast and efficient implementation of new techniques and assistance to analytical processed industrialization,
- Expert consultancy for choosing the most adapted tests, subtrates or techniques,
- Unsurpassed experience of the requirements and feasibility of tests in a medical environment, not only in the R&D process but also for companion testing once the product is marketed,
- Rational and pragmatic approach for the selection of test panels and decision trees with clinical oriented added value fitting specific customer needs,
- Sample sourcing solutions,
- Inter-techniques or inter-devices evaluation capabilities thanks to our large range of technical equipment.

BARC Biorepository

BARC owns storage facilities across the globe for its customers to store samples that may benefit from further testing as new information becomes available on the pharmacodynamics (PD) or pharmacokinetics (PK) of the drugs. These samples can then be analyzed retrospectively for specific biochemical analytes or proteomic /pharmacogenetic (PG) Biomarkers.
BARC has long-standing experience with controlled storage of biological samples collected during a clinical trial. In addition, relabeling, anonymization, de-identification and un-blinding services are routinely available.

- Storage capacity : several million clinical trial samples in - 70/80°C freezer storage and liquid nitrogen
- Specialized logistics
- FDA approved system (in South Africa)
- Qualified staff and electronic barcoded sample tracking.

Facts

- *Over 300 pathologists & PhD's*
- *Over 2.500 tests in portfolio*
- *Specialists in all therapeutic fields*

BARC's WORLD

"BARC's aim is to provide the same cutting-edge central lab service worldwide, wherever our customers want to conduct clinical trials in Asia, Europe, Americas, Africa or Australia. Our business model of integrating central lab activities into world class medical labs provides our customers with unmet testing capabilities and quality partnership including scientific consultancy."

Michel ABITEBOUL MD, Chief Executive Officer

Global reliable logistics

BARC's strategic locations near main courier hubs guarantee rapid delivery of samples from any part of the world. Even remote areas can be serviced within 24-48 hours.
BARC has online access to the major courier services for tracking of samples during transit.

Customised supplies and documentation

Our extensive research on investigator operations has led us to develop a variety of customized products. These range from compact, foldable packaging and shipping supplies, in compliance with IATA regulations, to supplies for deep frozen shipments without dry ice. All forms and documents are customized and preprinted on a per-study basis. BARC also provides sites with personalized study requisition forms with integrated labels for easy tracking of samples. BARC's instructional materials are acknowledged for their clear layout and easy-to-read pictograms. Leaflets in the native languages of the investigators, including pictograms, optimize performance of sampling and handling.

In-house kit construction

All kits are built at our facilities in Belgium, the USA, China and South Africa. User friendliness is paramount and sites are automatically notified to re-order supplies or are informed when expiry dates are approaching to ensure kits are always available and ready to be used for patient sampling.

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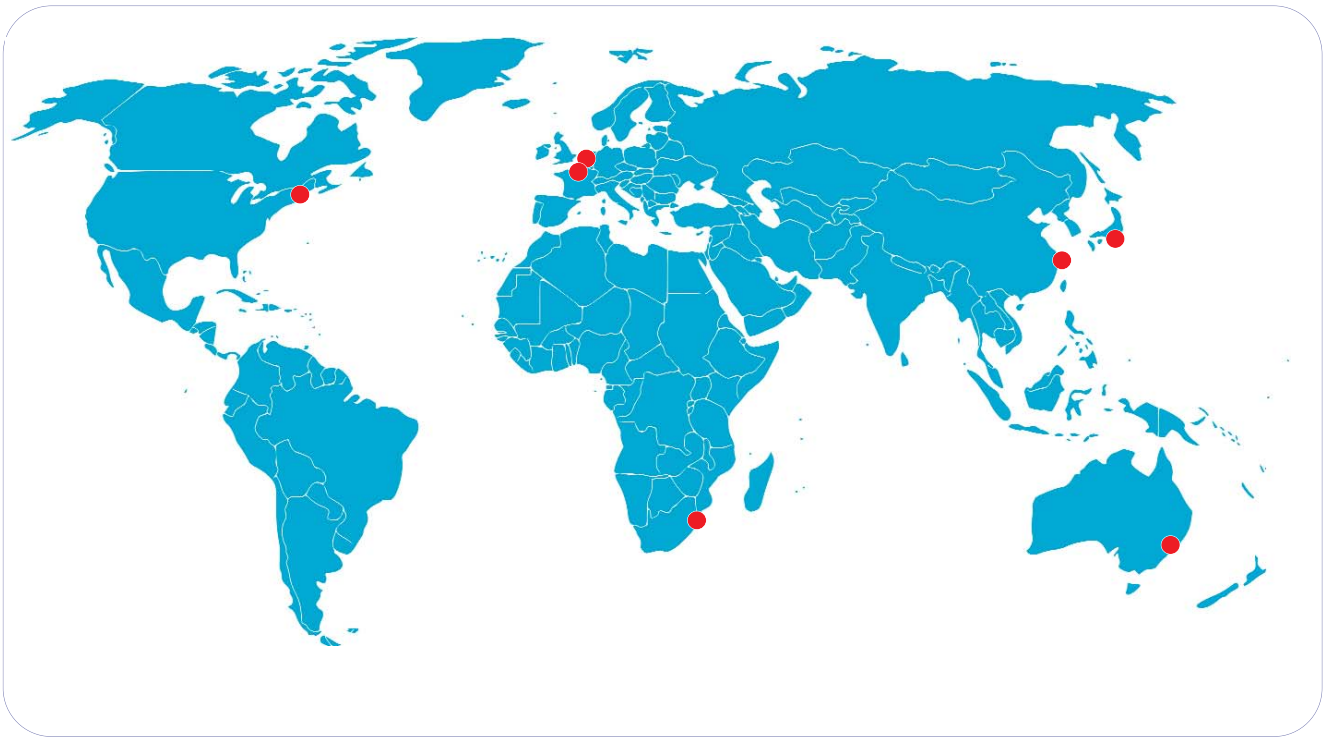

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ONCOLOGY:
HISTO-CYTOPATHOLOGY

Broad fields of expertise

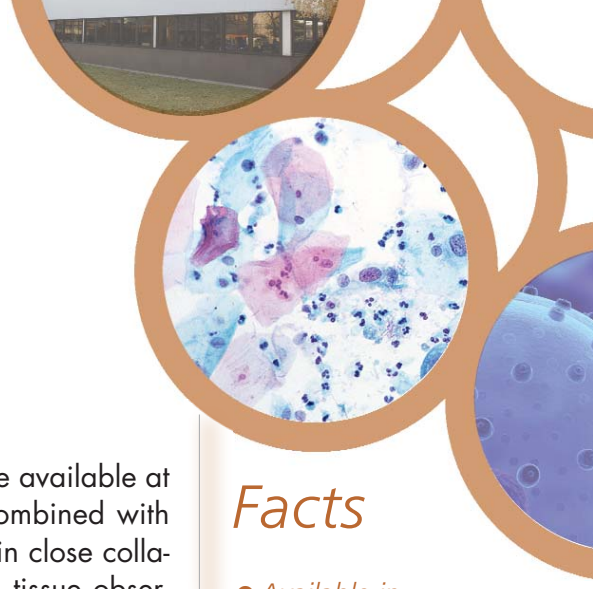
The Histo-cytopathology department of BARC Laboratories is organized around three main axes: Cytology, Histopathology and Immuno-histopathology.

At the forefront of innovation

Our pathology department employs highly-skilled and trained technicians equipped with the latest devices for sample preparation (including macro-dissection), tissue staining, immuno-staining and CISH labeling.
In collaboration with the molecular genetics department, our pathologists develop and daily run the most recent tests that assess and predict response of cancer patients to targeted therapies (see p. 20).

Our Institut de Brux

This school is hosted by the Laboratoire Cerba in Paris. It provides a one-year training (full time) for students to qualify in cytology.
After completion of this curriculum, they are able to read slides from cervix samples and then act as cytotechnicians participating to the screening and prevention of cervical cancer.
The Institut de Brux is open to students of any origin, including developing countries where endemic lack of skilled cytotechnicians is often noticed.



Integrated techniques

All techniques for comprehensive exploration of tumor tissue are available at BARC, from immunohistochemistry to FISH and CGH-array, combined with the expertise of pathologists and clinical pathologists working in close collaboration for integrated and seamless processing ranging from tissue observation in pathology to the most advanced molecular testing.

- Expertise in pathology for tissue observation and analysis in a wide range of organs and tumor types
- Collaborations with world-class academic experts on very specific topics or difficult cases
- Extensive experience with multi-institutional clinical trials in oncology and hematology
- Wide capabilities in immunohistochemistry with a large catalogue of antibodies, either on Dako or Roche Ventana platforms
- Extensive list of FISH probes combined with human expertise in results interpretation
- Gene expression profiling by RNA extraction and quantitative RT-PCR
- Molecular genetics (Southern blot, PCR-QL/QT)
- CGH array capabilities on tissue specimen
- Technology transfer skills for integrating custom antibodies in immunohistochemistry or custom probes in FISH
- Full integration of pathology and molecular biology departments, especially for tests predictive of therapeutic success in personalized medicine (e.g. targeted therapies)

AT THE FOREFRONT OF THE R&D IN ONCOLOGY

Cerba European Lab is a partner of the Atlas of Genetics and Cytogenetics in Oncology and Hematology (www.atlasgeneticsoncology.org).
"This website is a peer reviewed on-line journal and database in free access on internet devoted to genes, cytogenetics, and clinical entities in cancer, and cancer-prone diseases. It is made for and by clinicians and researchers in cytogenetics, molecular biology, oncology, haematology, and pathology. Contributions are reviewed before acceptance. It is at the crossroads of research, virtual medical university (university and post-university e-learning), and telemedicine. It contributes to "meta-medicine", this mediation, using new information technology, between the increasing amount of knowledge and the individual, having to use the information."
In addition, many Cerba European Lab pathologists also have an academic research activity and publish in international journals.

Facts

- *Available in EU/US/Asia /Australia*
- *Resident/internship program in the US*

ONCOLOGY: ONCOHEMATOLOGY

"Although initially based simply on clinical and cytological monitoring, hematology today constitutes an excellent model reflecting the advances in the field of oncology.
Many of us - cytologists, immunologists, cell geneticists and molecular biologists – contribute our know-how to the process of understanding, diagnosing and following up malignant blood and bone marrow diseases.
A new and essential collaborative approach to the treatment of malignant blood and bone marrow diseases is now available to us."

The Onco-hematology team

Oncology and Hematology Department

BARC's oncology and hematology department combines all the disciplines that contribute to the diagnosis, prognosis and targeted therapy of malignant blood and bone marrow diseases:

- Cytology and Immunophenotyping
- Conventional cytogenetics
- Molecular cytogenetics (FISH)
- Molecular biology
- DNA Array, RNA Array,…

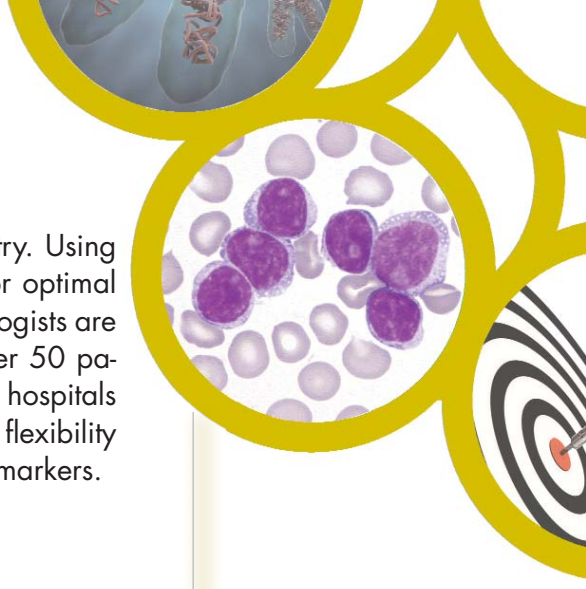
Well aware of the importance of early and appropriate management of malignant blood and bone marrow diseases, BARC laboratories offer optimal turnaround times. For instance, the mean turnaround time for karyotyping is 6 days, with less than 1% culture failures.

Hematologic Cytology

BARC's team of medical hematologists offer their expertise in reading and interpreting pathological blood counts, myelograms and lymphoadenograms. Cytology often gives the first diagnosis in front of an abnormal count.
It requires highly skilled and experienced people to properly assess the type of hematological malignancy and to choose the type of subsequent tests to be performed to confirm or refine the diagnosis.

Hematology Immunophenotyping

Immunophenotyping is a great tool for characterization of hematological malignancies using immune features of the pathological cells. Yet, a very large panel of antibodies is required for a quality diagnosis and confrontation with data from cytology. Therefore, BARC's list of tests includes one of the largest panels on the market for immunophenotyping of lymphoproliferative syndromes and acute leukemias.



Flow cytometry

BARC has over 10 years of extensive expertise in flow cytometry. Using state-of-the-art equipment (up to 10-channels flow cytometers for optimal testing performance as well as cost efficiency), our clinical pathologists are highly skilled thanks to their experience in the medical lab (over 50 patients processed per day). Most of them also operate in university hospitals and therefore stay up-to-date in both skills and knowledge. Their flexibility enables fast andeffective implementation and validation of new markers.

Cytogenetics

Conventional cytogenetics:
Karyotyping of any specimen: blood, bone marrow, lymph node, etc.

Molecular cytogenetics (FISH):
BARC offers all the probes necessary for precise diagnosis, either commercially available or developed in-house.

- CLL profile
- MPN profile
- MDS profile
- Myeloma profile
- ALL profile
- AML profile
- NHL profile

The expertise of BARC's clinical pathologists, in combination with laboratory equipment and technicians dedicated to serving patients on a daily basis as a medical lab, enables fast and efficient technology transfers for seamless implementation of new probes, either commercially available or custom-made.

Molecular biology

Molecular biology enables the detection of mutations or genetic abnormalities that complement caryotype and FISH studies. It is especially valuable in AML with normal karyotype. BARC can analyse most mutations of clinic of interest and has the capabilities for implementing sequencing protocols for investigating new genes/mutations on its own, or by technology transfer.

Proteins

BARC offers a broad range of proteins characterization tools for onco-hematology:

- Electrophoresis of serum (capillary technique) and urine proteins
- Immunofixation of serum and Bence Jones proteins on agarose gel
- β- and κ- free light chains (The Hevylite™ technology is available)
- β-microglobulin

MOLECULAR KARYOTYPE IN DNA ARRAY

DNA-Array is a revolutionary technique for the fine diagnosis of hematological malignacies (amplifications, insertions and deletions). It represents a "missing link" between cytogenetics and molecular diagnostics. This molecular karyotyping provides a global approach with unsurpassed resolution and is routinely used at BARC for investigations in onco-hematology but also for constitutional genetics.

Facts

- *Global presence of specialized clinical pathologists*
- *DNA array and RNA array gene expression capabilities*

INFECTIOUS DISEASES

"The twentieth century did not see the eradication of infectious diseases, despite the optimistic predictions made by some.
The emergence of new pathogens such as HIV has been accompanied by a technological evolution in diagnostic methods, particularly with respect to molecular biology.
Over the last 20 years, I have seen constant progress in detection, quantification and genotyping methods.
Without these methods, the hepatitis C virus, for example, would not have been identified nor would the treatment of chronic viral diseases have benefited from the advent of new antiviral drugs to the same extent."

Jean Dominique POVEDA , MD
Clinical Virology & Molecular Biology Specialist

A comprehensive portfolio of tests

BARC offers pharmaceutical and biotech companies a broad range of tests in virology, bacteriology and parasitology.
The latest techniques are used in the laboratory for screening, confirmation and assessment of infectious diseases, but also all related tests for both host and disease-related genetic testing.
Over the past 25 years, BARC Global Central Laboratory has become a leader in virology testing and vaccine clinical trials. Current studies include late-stage global influenza and H1N1 trials, utilizing a proprietary viral culture algorithm developed at BARC which culminates in the sequencing of positive cultures. Molecular diagnostics capabilities include qualitative & quantitative assays. Qualitative & quantitative cultures are done on virus-specific cell lines.

BARC analyzes over 500,000 virology samples each year.

- Selected assays (culture and PCR where applicable) include:
  - Influenza (A and B)
  - Parainfluenza (1, 2, and 3)
  - Respiratory syncytial virus (RSV subgroups A and B)
  - Candida
  - Adenovirus
  - Rhinovirus
  - Respiratory infections including coronaviruses (OC43, 229E, NL63, SARS, HKU1) and human metapneumovirus
  - Dengue
  - Clostridium difficile
  - Amplified Mycobacterium Tuberculosis Direct Test (AMTD)
  - Chlamydia
  - Hepatitis
  - HIV
  - HPV
  - Enterovirus detection
  - Malaria
  - Group B Strep screen
  - MRSA screen
  - Bordetella
- Hemagluttination inhibition (HAI)
- Plaque reduction
- Sequencing

BARC offers a full range of microbiology testing services for bacteriology, mycology, parasitology and microbioterrorism pathogens. The laboratories also have the capability to culture, quantitate, identify and determine antibiotic susceptibility and resistance for aerobic and anaerobic bacteria. Organism isolated on site are shipped to BARC for identity confirmation and MIC testing with customized panels.

Latest techniques, best performance

BARC laboratories use the latest techniques in molecular biology and develop new tests for faster results, higher sensitivity and contained costs, constantly providing our customers with optimal service.
BARC introduces cutting-edge new tests on a regular basis like non-invasive procedures for hepatic fibrosis measurement or host-related genomic tests for stratification of patients with Hepatitis C according to their predicted likelihood of responding to treatment or to developping side effects.
As a consequence of hosting and collaborating with world-class specialists, BARC is able to react very quickly to new infectious threats and to develop new tests in a very short time offering pharmaceutical companies, clinicians, and health authorities a fast and secure diagnosis opportunity.
For example, BARC introduced the diagnostic of H1N1 influenzae in September 2009. Those technology transfer capabilities are highly valuable in the very fast moving market of virology.

BARC offers all techniques required for optimal detection, quantification and characterization of pathogens:

- Serology
- Western blot confirmation
- Culture and quantification
- PCR-based techniques for pathogens detections and viral load measurement
- Mass spectrometry-based techniques for rapid bacterial identification

Facts

- *Global P2 laboratories*
- *Global P3 laboratories*
- *Specialized scientists with global presence*

HEPATITIS

BARC offers the latest tests for screening, diagnosis, assessment, therapeutic staging and follow-up of hepatitis A, B, C, D and E.
In collaboration with the molecular genetic department, genotyping of *IL28B*, *IFNL4*, *ITPA* and *UGT1A1* genes are also available as a powerful tool for the prediction of the therapeutic response of patients with hepatitis C.
Comprehensive profiling of the disease and of its impacts on the liver may be measured by HCV GenoFibroTest™ or other tests, like FibroTest™, ActiTest™, NashTest™, AshTest™ and FibroMax™, all of them routinely perfomed at BARC for assessing the hepatic function of their patients without invasive procedure.

CARDIOVASCULAR DISEASES

"Clinical pathology for Cardiovascular Diseases has been previously limited to safety testing but discoveries in the field of pharmacogenomics and of the long-term cardiovascular effects of many therapies give a new importance to highly specialized testing in this field. Therefore,cardiovascular testing required in many clinical trials now demands a solid expertise in many therapeutic areas, integrated with cutting-edge testing capabilities"

Didier Pitsi, Pharm D, Ph D - Chief Scientific Officer

From routine to esoteric testing

BARC offers a wide range of tests for assessing of the cardiovascular risk:

- Plaque formation: lipids assessment (including direct assay of LDL cholesterol), lipoprotein a, apolipoproteins A,1, B, CIII and E, homocysteine, apo-E genotyping for genetic cardiovascular risk related to hyperlipidemia,...
- Plaque rupture: IL-6, TNF-a, ICAM, VCAM, lipoprotein-associated phospholipase A2, MMP-9, MPO, soluble CD40 ligans, P-selectin, CRP-US,...
- Myocardial muscle risk: lactate, LDH, AST, CK, CK-MB mass, myoglobin, troponin T and I, FADP,...
- Heart dysfunction: BNP, NTproBNP,...

Hypertension

Hypertension is among the most common chronic medical problems faced by healthcare providers. Several tests proposed by BARC help with characterizing hypertension and its causes, including vasopressin (ADH), HVA, aldosterone, 3 o-methylthyramine, VMA, metanephrines (urine or plasma), renin, catecholamine fractionation, angiotensin II, ...

Therapy-induced cardiovascular risk

Several drugs across drug classes (antitumoral, antiviral,...) increase short and/or long-term cardiovascular risk, a particularly important side effect for patients treated with efficient drugs and therefore having a long life expectancy. As such, side effects of drugs on the cardiovascular system must be carefully investigated when developing a new drug.
As a Central Lab with highly specialized capabilities in all therapeutic areas, BARC is able to provide its customers with extensive expertise in those fields along with a large panel for cardiovascular risk assessment.

In addition, BARC has a large expertise in pharmacology, toxicology and drug assays using the latest quantitative techniques in mass spectrometry. Depending on the drug and/or the cellular pathway involved, this may be a key-capability for studying drug interactions with nutrition, genetic background or other drugs, especially for cardiovascular drugs where long-term side effects are of primary importance. Therefore, BARC offers its customers a comprehensive panel of tests in biochemistry, pharmacology, toxicology and pharmacogenomics for tailored customer- and application-oriented study design, technical capabilities and expert interpretation.

PHARMACOGENETICS

Inter-individual genetic sensitivity to drugs is a developing field with increasing numbers of susceptibility genes. In addition, interactions between drugs, nutrition, environment and lifestyle are an active field of research where most remains to be discovered, and which is of primary importance since it conditions both individual drug efficiency and safety. With its large panel of tests in metabolism, pharmacology and pharmacogenomics integrated with our clinical pathologists expertise and daily involvement in the medical lab, BARC is arguably the best option for complex clinical studies involving cardiovascular drugs.

ENDOCRINOLOGY & METABOLISM

"Endocrinology and metabolism are exceptionally complex fields in terms of analytical requirements since the slightests variations in hormone or enzyme assays may have important effects in a context of highly complex interactions, including genetic features. Therefore, clinical trials in this field require multiple capabilities and expertise that one single scientist cannot hold. At BARC, many medical specialists work together to offer a comprehensive understanding of hormonal and metabolic systems."

Claudine Rigal, Pharm D, Clinical pathologist - General Manager Cerba

Endocrine Diseases

The diagnosis and follow up of endocrine diseases requires coverage of numerous laboratory parameters using relevant methods to assess circulating marker levels and their specificities.
The specialized endocrinology department offers a very extensive range of hormonal assays from the most frequently requested to the rarest.
Over 140 tests cover the complexity of endocrine glands regulation: assay of precursors; pharmacologic tests; proximal and distal investigation; dynamic tests.
Precise diagnoses are available in fields as varied as hypertension, adrenal disease or diabetes mellitus.

Amino acids

Pathologic modifications of the amino acids level may indicate a condition related to renal or hepatic disorders or an inborn metabolic disease. There are over 50 diseases due to inborn errors in the metabolism of amino acids. Early diagnosis is of particular importance since an early treatment may significantly improve the patient's health.
BARC laboratories offer full characterization of amino-acids and metabolites using HPLC, and soon LC-MS, techniques. Our experienced clinical pathologists interpret results in the context of the overall clinical picture and help clinicians to choose the most adapted medical strategy for their individual patients.

Diabetes

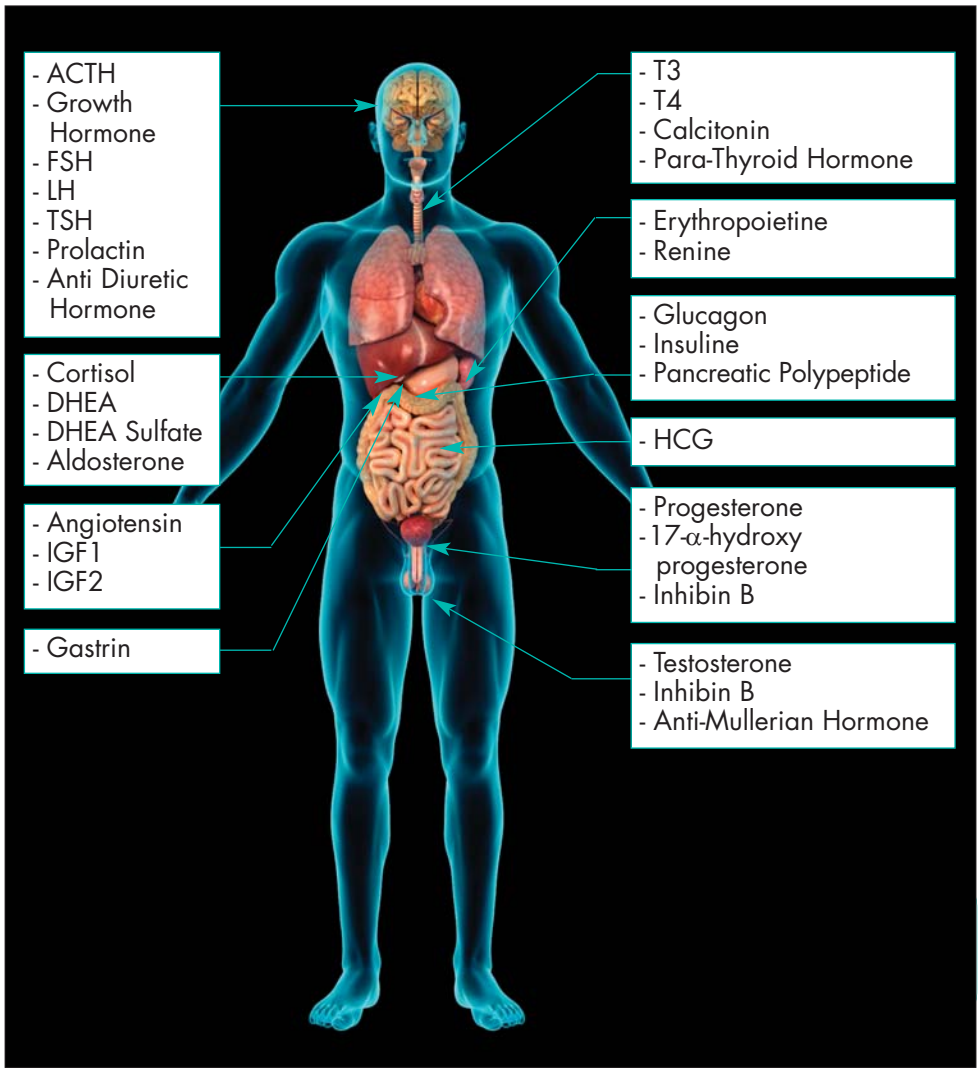
As one of the fastest developing conditions, diabetes is a major health problem and an important field of research for pharma companies. Beyond classical assays, BARC offers all auto-antibodies necessary for diabetes assessment, classification and follow-up (insulin Abs, islet cells Ab, IA2 Abs, GAD Abs).

Metabolic Diseases

Metabolic diseases are a complex field. They comprise a huge amount of diseases potentially affecting a wide range of systems in the human body. Moreover, symptoms may be extremely heterogenous and sometimes faint, making those diseases difficult to diagnose.
BARC laboratories offer a wide portfolio of tests to assess metabolic diseases from different origins and to help clinicians in specific patient-management. Various techniques are used, including sequencing in molecular biology, as most of those diseases have a genetic origin.

This group of diseases is characterized by the accumulation of abnormal metabolites or normal metabolites in pathological quantities, such as:

- Porphyrins
- Amino acids
- Long-chain fatty acids
- Very long-chain fatty acids
- Organic acids
- Lysosomal enzymes



Facts

- *Glycemic and other lipidic parameters*

Leptin
Insulin
HOMA-IR
Fructosamine
C-peptide
FFA

- *Inflammatory markers*

Haptoglobin
Fibrinogen
TNF-alpha
IL-6
PAI-1 Ag

- *Lipid panel*

ApoA1/B

- *Liver markers*

CK18 M30
CK18 M65
Adiponectin
Ferritin
Hyaluronic acid
Alpha2 macroglobulin
PIIINP
TIMP-1
FGF-19
FGF-21

- *Calculated fibrosis & steatosis index*

- *Urinalysis*

Alpha1 microglobulin
Beta-NAG
N-Gal
Albumin
Creatinine
Microscopic analysis
Urinalysis dipstick
AFP
TPA
Cyfra 21-1

AUTOIMMUNITY & ALLERGY

"In this discipline, I find it fascinating that, on the basis of the simple principle of the antigen-antibody reaction, our diagnostic instruments enable us to communicate with clinicians in a wide variety of specialized medical fields: allergy, gastroenterology, endocrinology, nephrology, dermatology, rheumatology, internal medicine, neurology, haematology, etc."

Stéphanie FRANCOIS, Pharm D. - Immunology & Allergology Specialist

Autoimmunity

In recent years, real progress has been achieved in elucidating the pathophysiological mechanisms involved in the emergence of autoimmune diseases. Thanks to the characterization of new target antigens, more specific and more sensitive markers are now available for diagnostic use.
The methods are based on indirect immunofluorescence, radioimmunoassay, EIA, dot-blotting and the Ouchterlony procedure.
BARC's large panel of tests covers both systemic diseases: lupus erythematosus, rheumatoid arthritis, scleroderma, myositis, anti-phospholipid syndrome and organ-specific diseases: autoimmune disease of the skin, kidneys, blood vessels, gastrointestinal tract, central nervous system, endocrine glands, etc.

Proteins

Proteins reflect a large number of metabolic functions: inflammation, nutritional status, hemolysis, immune response, renal function, hepatic function, neoplastic proliferation, etc.

Proteins may be investigated:
- Qualitatively, by electrophoretic separation of various biological fluids: serum, urine, cerebrospinal fluid.
- Quantitatively, by an assay based on methods enabling coverage of the expected concentration ranges: turbidimetry, nephelometry, colorimetry, RIA, ELISA, radial immunodiffusion.

Allergy

BARC's labs allergy departments run over 300,000 tests per year in Europe, being one of the leading European laboratories for allergy testing. The panel of tests available ranges from screening to precise diagnostic tests:

- **Screening:**
  - Total IgE assay,
  - Allergen mixtures: respiratory, dietary, pediatric.
- **Identification:**
  - Individual allergens: serum IgE; over 600 allergens available,
  - Basophil activation tests for drug-related allergies.
- **Immunotherapy follow-up:**
  - Monitoring by specific IgG4 assay.
- **Food allergies:**
  - Specific IgG.

SPECIALIST IN AUTO-ANTIBODIES ASSAYS

- Large antibodies panel from the most common to the rarest autoimmune diseases
- Wide range of techniques (IIF, EIA, ELISA, random access closed automated system with chemiluminescene of fluorescence detection, immunodot, RIA, Ouchterlony double immunodiffusion technique, IIF on transfected cells,…
- Specific expertise in IIF reading with expert technicians, direct copy of results in the computerized system without paper interface, software analyzing the coherence between screening and titration results, large volumes for optimal training and constitution of a collection of rare antibodies,…
- Expertise in clinical pathological validation with world-class experts
- Capabilities in technology transfer for adapting to new techniques and reagents
- Fast results

ImmunoCAP ISAC PHADIA®

ImmunoCAP ISAC PHADIA®: biochip enables simultaneous assay of 103 allergenic components in one shot. It is a valuable tool for investigations in particularly complex allergenic profiles.

Allergen Panel

- *Basophil activation test: 66 allergens & 1 conservative profile*
- *Single pneumallergen: 230 allergens, including 33 recombinant allergens*
- *Mix of pneumallergens: 34 mixes*
- *Single trophallergen: 233 allergens, including 22 recombinant allergens*
- *Mix of trophallergen: 41 mixes*
- *Venoms, insects and parasites: 24 allergens, including 1 recombinant allergen*
- *Latex: 9 allergens, including 8 recombinant allergens*
- *Drugs: 71 allergens*
- *Occupational allergy: 31 allergens & 5 mixes of allergens*
- *Multi-allergen pipetes CLA®: 8 CLA® pneumallergens, 11 CLA® trophallergens & 8 CLA® hybrids*
- *IgG/IgG4: 46 allergens*
- *IgGs: 18 allergens*
- *IgG4s: 5 allergens*

PERSONALIZED MEDICINE

"Targeted therapies radically change the way clinicians envisage cancer. They offer new treatment alternatives adapted to the patient's tumor while avoiding non-responsive patients losing time and experiencing side-effects. Tests for predicting the treatment efficacy are therefore the corner stone of these new therapies. More and more pathologies benefit from new targeted medicines; it's only the beginning."

Stéphane Chanel, M.D. - Pathologist Specialist
Jean-Marc Costa, Pharm.D. - Clinical Pathologist Specialist

A new era in Oncology

In parallel to advances in the understanding of genetic inter-individual cancer susceptibility, major discoveries have been made in studying the genetics of tumors. New medicines are available on the market for cancer treatment, the efficacy of which depends on tumor's genetic characteristics.

Predictive tests for tailored therapies

New drugs against cancer marketed recently are targeted against specific proteins overexpressed in cancer. They benefit patients with tumor cells carrying specific genetic features only, which are to be investigated prior to the administration of the drug. Therefore, BARC offers predictive tests for targeted therapies to be performed directly on the tumor using the latest techniques both in histopathology and in molecular biology.

Breast cancer and stomach cancer: Her2 amplification test

Both for breast and stomach cancer, over expression of Her2 protein is assessed by histopathology using immunohistochemistry techniques (IHC) and *in-situ* hybridization, both in fluorescence (FISH) and in bright field (CISH) microscopy.

NEW TESTS IN THE PIPELINE

With cutting-edge capabilities in specialized diagnostic tests, BARC permanently surveys the latest medical advances to set up new predictive tests for tailored therapies, depending on their reliability and validation by international consensus. Our Medical Board is in charge of identifying the tests of tomorrow in order to offer them to the customers of BARC.

Colon cancer and lung cancer: Genetic investigations

New antibody-based therapies against colon and lung cancer require assessing the genetic characteristics of the tumor cells (e.g. *KRAS* gene in colon cancer and *EGFR* and *ALK* genes in lung cancer). Performing those tests implies an efficient collaboration between pathologists optimally preparing tumor tissue samples and clinical pathologists ensuring the molecular biology diagnosis. At BARC, pathologists and clinical pathologists are under the same roof and collaborate every day to provide patients and physicians with the best medical service.

Pharmacogenomics

Host-related characteristics often play a critical role in treatment indication, dosage, tolerance, efficacy and occurrence of side effects. BARC's experts have implemented several techniques and set up many in-house sequencing tests for assaying individual genetic characteristics that are involved in individual response to drugs.
Pharmacogenomics is a cornerstone of personalized medicine and more and more, clinical trials require those tests to precisely assess the added value of a new drug.
Since BARC laboratories routinely have a medical clinical pathology activity, BARC's specialists are highly aware of the requirements for a pharmacogenomic test to become a routine companion diagnostic test. Their expertise in this field is valuable for optimizing the trials and transferring such tests into clinical routine.

Facts

Tumor related predictive tests

- *HER2/Neu*
- *KRAS*
- *BRAF*
- *EGFR*
- *ALK*
- PDGFRA
- cKIT
- ...

Host related predictive tests

- *IL28B*
- *IP10*
- *UGT1A1*
- HLA B*5701
- m.1555A >G mutation
- ...

PHARMACOGENETICS TESTS

Examples of pharmacogenomic tests routinely performed:

UGT1A1 genotype (hyperbilirubinemia in hepatitis C treatment)
ITPA genotype (anemia in hepatitic C treatment)
IL28B and *IFNL4* genotype (predictive response to hepatitic C treatment)
CYP 1A2 genotype (drugs metabolism)
CYP 2C19 genotype (predictive response to Clopridogrel)
CYP 2C9 genotype (Warfarine-induced risk of thrombosis)
CYP 2D6 genotype (Tamoxifen hormonal therapy)

PROCESS MANAGEMENT & CUSTOMER SERVICE

"Standardized logistics and data management are the basics of Global Central Lab activities. At BARC, we emphasize a customer-oriented approach in study set-up and follow-up through expert Project Managers devoted efficiency. Our PMs are considered by our clients as an extension to their own clinical teams. This ensures outstanding partnership quality for the success of their projects."

Nele Langenaken, Ph D. - Chief Operation Officer

Project Management

Having great project management is the key to ensuring studies run well and communication is optimal. BARC offers an extensive range of support services, ensuring smooth deployment of a clinical trial program. Experienced Project Managers are assigned to every trial and provide a single point of contact for all aspects of service.

Project Managers and their dedicated team conduct training sessions, perform daily data cleaning and interface with Sponsor staff and investigator sites. We employ a team approach so that in the event the Project Manager is unavailable, another member of the team is accessible and familiar with the study.

Experienced clinical pathologists are available for consultation in every BARC laboratory.

Investigator support

BARC Global Central labs services thousands of investigator sites around the globe. We strongly believe that the best support is obtained through our dedicated Local Project Teams. They ensure optimal communication and site follow up through dedicated phone lines, email and/or fax within the local time zone:

- Provide alert values to sites
- Provide clear study specific comments on lab reports (inclusion, exclusion,discontinuation comments, ...)
- Available for any study specific support
- Training at investigator meeting
- Data cleaning including follow up through data clarification forms
- Reminders to ship frozen samples in batch

Data Management

Single global database:

All global trials are integrated in a single global study database; uniform reporting formats ensure proper administrative handling of study reports. BARC's reporting system facilitates easy adaptation to trial-specific needs such as :

- Duplicate reporting units (classical or SI)
- Evaluation boxes
- Alert flagging
- Blinding
- Monitoring of inclusion and exclusion criteria linked with laboratory tests.

Reports are faxed or e-mailed promptly and automatically to the investigator.

We offer:

- Transparent results worldwide
- Routine results reporting within 24 hours
- Advanced web tools and remote data access
- Electronic data transfer (compliant with the 21CFR part 11 and the new FDA guideline for electronic data transfer and security)

QUALITY ASSURANCE

Operating as a global central clinical laboratory for pharmaceutical companies and performing sample analyses in the framework of clinical trials (phases I to IV), BARC is committed to adhering to strict quality assurance guidelines in order to fulfill the requirements of clients who need to operate under Good Clinical Practices (GCP).

A broad range of accreditations and certifications ensure stringent quality management in all aspects of the organisation. Consistency and quality are the keys to BARC's success. As such, processes have been put into place to ensure laboratory results are meticulously monitored with daily instrument calibration and an extensive internal quality control program.

In addition, all laboratories participate in a large range of external proficiency testing schemes such as CAP, NEQAS, CDC, NGSP, national external Quality Control programs and commercial programs.

BARC's Global Quality Assurance department, which is fully independent from the operations, is responsible for issuing and reviewing standard operating procedures and working instructions, performing extensive internal audits and hosting a large number of sponsor audits each year.

Client feedback, originating from meetings with clients, audits or remarks, is centralised through our QA department and is considered as useful input for process improvement. Each finding or remark is submitted to an in depth root cause investigation in order to define appropriate corrective and/or preventive actions.

BARC

Global Central Laboratory

www.barclab.com

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