REVIEW ON MEDICAL LABORATORY SCIENCE
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ABSTRACT: The Medical Laboratory Science (MLS) or Biomedical Laboratory Science is an area of laboratory medicine that employs specific scientific techniques focused on sound epistemic judgement in the study of human samples like fluid and tissues which helps in the diagnosis, care, disease prognosis and drug response monitoring. A biomedical researcher is educated and versed in the concepts and the teaching of medical laboratory research and the art. Thwy aids in clinical diagnosis by detecting infectious disease aetiologic agents; evaluating certain disease conditions by laboratory examination of biological fluids and samples, which aids in disease control. Diagnosis precedes treatment in all types of health care, and specific diagnosis ensures prop Managing diseases. The Laboratory is the scientist's primary workroom. Outside the labs though, there are other possibilities. This paper aims to expose the various ways in which a biomedical scientist can have a larger effect than his or her routinous bench work and directly affect the medical environment.

KEY WORDS: Biomedical Laboratory Science, Medical Laboratory Science, Academics, Biomedical Engineering, Public Health, Pharmacology, Clinical Pathology.

INTRODUCTION
Medical laboratory scientists, also referred to as clinical laboratory scientists, play a vital role in patient diagnosis, care and management. They are the third most comprehensive medical career (after physicians and nurses). Medical laboratory scientists do complex testing using sophisticated tools for disease detection and treatment monitoring. Medical laboratory scientists may isolate and identify an infectious organism that causes the use of pneumonia or cross-match blood in a transfusion of a patient. The laboratory tests they perform will show whether glucose is normal or too high for a diabetic patient, or they may perform blood tests to detect and identify leukemia (blood cell cancer).

The MLS is the area of research that deals with diagnosis, prognosis, care, prevention, and disease management in humans, animals, and the environment by studying body fluids and tissues. The medical laboratory scientist is one who has fulfilled the theoretical and technical criteria laden with the philosophy and techniques to conduct these research commitments. The scientist's primary place of research is the medical laboratory, which is a location designed to test and analyze samples from the body fluids and tissues for the purpose of providing information on diagnosis, prognosis, recovery, disease prevention and therapy response control. The role played by the laboratory for medical diagnosis cannot be over emphasized. As researcher, a consulting pathologist, noted, "only medical findings help to differentiate functional from organic and idiopathic from non-idiopathic. In short, a clinic for the medical treatment is more than a treating person's backbone. It is the very spirit that makes diagnosis. Effective treatment does indicate effective care for patients. 'If wellbeing, as per World Health Organization (WHO), if the state of full physical, mental and social well-being, and not the pure absence of sickness and/or infirmity, is essential for the survival of humanity, then all attempts must be directed at making use of this vital input from the scientific laboratory. The Royal College of Pathologists motto states, "Pathology is the secret science at the heart of medical medicine; Crucial to medical diagnosis and health treatment.' Beyond being a key part in laboratory medicine, MLS is the lynchpin in important developments in scientific study and knowledge. It is also right that this area of analysis should be grasped.[1] The Indian Journal of Medical Research (IJMR) is a biomedical journal with international circulation. It publishes Original communications of biomedical research that advances or illuminates medical science or that educates the journal readers. It is issued monthly, in two volumes per year. Medical Laboratory Research is a branch of medical science that uses flow-cytometry, microscopes, advanced staining methods, chemical analyzes and highly sophisticated precision instruments to deal with patient
diagnosis, care and management. Besides carrying out the many types of crucial laboratory tests, clinical laboratory research helps interpret outcomes and organize knowledge for patient effective care. This area of science includes an understanding of the key principles for the study of body tissues and fluids using complex instrumentation, advanced techniques and specialist diagnostic skills, clinical patient care. Medical Laboratory Research is a branch of medical science that uses flow-cytometry, microscopes, advanced staining methods, chemical analyzes and highly sophisticated precision instruments to deal with patient diagnosis, care and management. Besides carrying out the many types of crucial laboratory tests, the journal publishes original articles, commentaries, editorials, letters to the editor, review papers, and case study detailing the original clinical & medical laboratory medicine research fields. Specific strategies and commitments to provide the most credible and detailed source of knowledge about latest medical developments. This research was performed to determine the prevalence of pseudomonas aeruginosa in patients using clinical samples (urine, skin lesion and pus) and environmental (sand, tap water, flowers) samples. Patients obtained a total of thirty (30) samples, ten (10) each of sweat, skin lesions, and pus. And also three environmental samples (tap water, sand and flower) were collected. Klebsiella spp, Pseudomonas aeruginosa and the proteus spp. Environmental tests for Pseudomonas aeruginosa were negative but staphylococcus spp and Escherichia spp were used. The percentage prevalence of the isolated organism was 50 percent in each of the environmental samples. The prevalence (percent) of clinically isolated p. aeruginosa was 12.5 percent (urine), 31.25 percent (lesion) and 15.38 percent (pus) respectively. For males, urine (6.25%), skin lesion (18.75%), and pus (7.69%), also for females, urine (6.25%), skin lesions (12.5%) and pus (7.69%). The presence of Pseudomonas aeruginosa is important for public health and these results suggest the prevalence of Pseudomonas aeruginosa, providing clues for prevention and treatment.

Manuscripts dealing with clinical aspects will be considered for publication, provided they contain results of original investigations. Articles need to be of general interest e.g., they cross the boundaries of specialties or are of sufficient novelty and importance that the journal’s readers, whatever their specialty, should be made aware of the findings. Research papers reporting original research, review articles (both narrative and evidence-based), research correspondence, letter to editor will be considered. Viewpoints and Perspectives are also considered. Papers of routine nature which are merely records of interesting cases as also those dealing with modifications of routine methodology will not be encouraged.

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Biomedical Science—Historical Background

Though clinical laboratory was invented by laboratory physicians in Hippocratic times (460-377BC). It wasn’t until recent times that the hospital's scientific labs formed as permanent institutions. As early as the 19th century, European physicians used findings from the very few pharmacist-operated primitive laboratories! Owing to developments in physics, chemistry and microbiology, it was only at the turn of the 20th century that research labs grew into permanent establishments in hospitals when groundbreaking methods were grew (Darlene 1999). Medicine and medicine lagged behind advances in the physical and natural sciences and there was no orthodox distinction, Homeopathic and herbal medicine (Youngson, 1978). Prescribing was better then than thought because of grossly poor awareness of the function of diseases and medicines.[2] Rethinking Medical Laboratory Science Today
Pioneering technicians, forefathers of medical laboratory science were based in Wohler's primordial laboratories, the first professor of chemistry to synthesize urea in vitro in 1828; Pasteur, the microbiologist who debunked the theory of spontaneous production, laid the groundwork for modern immunology and invented pasteurization for wine preservation in 1859; Koch, a country doctor who in 1870 postulated the principle of germs, et cetera. Angelina Hess (1181), a laboratory technician, invented the evolutionary use of agar-agar for the detection of bacterial colonies to solidify microbiological culture paper. MLS was built primarily through systematic mentoring.

Evolutionism in Medical Laboratory Science
Number of industrial countries develop standardized basic training schemes in the mid-1920s when such techniques acquired a patient use. Formal training and education systems for laboratory assistants or technicians were established in many developing countries under pathologist supervision by the 1920s. Clinical laboratory methods starting in the 1940s, patient monitoring and test outcomes have been strongly developed in hospitals as a part of general education and health care delivery. In the 1950s and 1960s, the proliferation in knowledge in the biological and clinical sciences, the introduction in robotics and more advanced laboratory technologies, the exponential rise of clinical trial menus, the extension of clinical laboratory workload And its importance to healthcare delivery has generated the need for well-defined medical technology or clinical laboratory programs to be structured more academically. The undergraduate curriculum material related to the fundamentals of biosciences: genetics, chemistry, physics, arithmetic, statistics, anatomy, and physiology, as well as manual and automatic clinical laboratory methods with sufficient continuous curriculum Data on quality control prior to reporting the test results and strategies for problem solving. Progress in clinical medicine in the 1950s, and expanded research menu demands improvements in laboratory procedure concepts and techniques.

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Biochemistry
Encarta Microsoft Library Dictionary (2005) describes biochemistry as the analysis of substances present in living organisms, as well as the chemical reactions that underlie life processes. This research is both a branch of chemistry and biology; bios prefix bio-comes, Greek word for "life." Biochemistry's main goal is to understand biomolecules' structure and behavior. These are the carbon-containing compounds that make up the various parts of the cell and conduct the chemical reactions that enable it to expand, to sustain a self-reproduction and to use and store energy. By gaining higher degrees in the field of medical biochemistry the biomedical scientist may pursue a career. Which gives him or her opportunities in the education and research community.

Physiology
Physiology is the study of the physical and chemical mechanism that takes place during the practice of life processes of living beings. This involves such essential processes as replication, development, digestion, excitation, and contraction as they are conducted inside the body's fine
structure, cells, tissues, muscles, and muscles. The medical laboratory scientist may also specialize in expert biology fields such as cell biology and blood circulation, muscle physiology etc.

Pathology
Pathology is a field of medicine dealing with assessing the origin and progression of diseases by studying body tissues and fluids. Pathology is classified into anatomic and clinical pathology. Anatomic pathologists conduct autopsies and examine tissues obtained during surgery or by biopsy from patients. Medical laboratory scientists contribute to the diagnosis of disease by measuring hormones and cells in blood, sputum, bone marrow, and urine. When understanding of human biochemistry and metabolism proliferated in the 20th Century, several more laboratory experiments were invented to differentiate natural states from disease states. Among the essential measures is the machine-based calculation of chemicals such as sodium, potassium, urea, and blood glucose; counting of different kinds of cells in the blood; and the identification of contaminants in the urine, which may help detect kidney disease. Identification of the kinds of cells in the bone marrow and blood leads to the diagnosis of certain cancer. MLS also guide the proper use of blood for transfusions, assess the suitability for transplantation of organs, such as the kidneys, and perform studies on identify various forms of blood clotting disorders. Microbiology laboratories, which monitor for the presence of pathogenic bacteria and viruses in the blood and tissues, are likewise under the guidance of scientists. In fact, they are looking for immune defects. A special specialty called forensic medicine centers around the study of physical findings of crimes. The lab scientist may by attaining higher degrees, work in these advanced fields of pathology.[9] Manuscripts dealing with clinical aspects will be considered for publication, provided they contain results of original investigations. Articles need to be of general interest – e.g., they cross the boundaries of specialties or are of sufficient novelty and importance that the journal’s readers, whatever their specialty, should be made aware of the findings. Research papers reporting original research, review articles (both narrative and evidence based), research correspondence, letter to editor will be considered. Viewpoints and Perspectives are also considered. Papers of routine nature which are merely records of interesting cases as also those dealing with modifications of routine methodology will not be encouraged. Further, serialization of articles by the same author(s)

Pharmacology and Toxicology
Pharmacology is the study of how chemicals communicate with living tissues. Whether the compounds are predominantly helpful, their research comes under the term therapeutics; if they are mainly dangerous, they are called toxicology. Pharmacodynamics in any case determines how the body consumes the substance, where it works, what its effect is and how it is metabolized and excreted. The scientist has been introduced to the foundation skills of pharmacology and toxicology as an undergraduate, so he or she can begin his exploration in this area. To reach higher degrees, the necessary requirements need to be met in other. The biomedical statistician is interested in the estimation of the system's impact with toxic environmental metals.[10]

Immunology
Immunology is an analysis of the immune system. It involves the scientific study of how the immune system functions in the body, including asthma, disease tolerance and foreign tissue approval or rejection. Immunology can also be said to be the analysis of the body's immune system's response to tissues to antigens stimulation. The basic experiences that the biomedical scientist has had as undergraduate in the fields of hematology, serology and immunology provide a forum on which he or she may work in the field of immunology

CONCLUSION
Although the biomedical scientist's primary workplace is the laboratory, there are still various opportunities in the outside world. Beyond bench, there are vast territories. There are prospects in research such as biochemistry and physiology; and areas of study such as anatomy, immunology, public health, biomedical engineering and so on. The scientist should then open his eyes to enter
greater heights where noble sacrifices can be made to milestones can be put in the annals of human history, about which it may be said: this is a career that stands out as a man’s giant.

REFERENCES