

Molecules and Medicine, Prescription for the New Era

New York Times, a leading daily in the USA, this past weekend (July 8, 2012) published an item by Gina Kolata, its well regarded science columnist, entitled, “Treatment of Leukemia: Glimpses of the future”.^[1] It is an absorbing story of a young physician- scientist, Dr. Lukas Wartman, a team member of a group in St. Louis, Washington University Genetic Research Unit, engaged in cancer research, a team among the best in the world, for their work and its significance. Lukas Wartman, a young talented and beloved colleague was found to have the very same cancer that he was devoted to studying- adult acute lymphoblastic leukemia. No known treatment seemed to be working and he was deteriorating fast.

Looking at this almost hopeless situation, the team at the Genome Institute of the university, got to work to investigate the complete genomic make up of this cancer. They fully sequenced genes of Wartman's cancer cells as well as his normal cells, and also the RNA. To find clues for what the DNAs were making, RNA studies were crucial.

The project team put other work aside and worked for several weeks round the clock using twenty six sequencers, and super computers. Amazingly, they found the clue. The culprit was a normal gene that was producing huge amounts of a protein that appeared to spur the growth in the cancer cells.

The cancer cells had a number of mutations. Nothing could be done in this regard, as no developments were known or available for intervention with drugs. (The RNA having showed the involvement of the gene, the normal gene FLT3, which produced huge amounts of the protein, wildly active in the growth and proliferation of cancer cells, search for drugs showed the way). Sunitib, a drug available and used in kidney cancer by inhibiting FLT3 expression was procured, administered and Wartman's progress followed up. Within weeks Wartman's condition improved and he went into total remission. Both the massive efforts to detect the “Molecular Culprit” and specific weapon to manage it cost enormously in this heroic effort. It need not be so, when such strategies become the common practice, as with other life saving measures. This story has a great lesson. The way to get to the bottom of a problem, the genes where all this happens and not necessarily always the tissue, which give us the end picture as the origin of damage. This is “molecular medicine” at its poignant best.

“Molecular Medicine” has been a buzz mantra for quite some period in the world of biomedical research and education. It is gaining ground rapidly in the clinical domain.

Historically, the divide between basic sciences and clinical sciences go back to Sydenham, the English Hippocrates, who influenced the course of medicine, medical research and education in the U.K.^[2] His ghost still walks the corridors of medical institutions in its homeland, and in the colony that we were, in India, where its presence is palpable and haunting. It has even threatened at times to assume a local hue with castiest fervor.

On the contrary, the healthy blending of basic and medical sciences, in the European tradition, was adapted to the American system, thanks to Flexner (3) and what has followed, is now history in

biomedical advances ushering in the new era in “molecular medicine”, with spectacular achievements in biomedical sciences drawing from basic sciences for nearly a century.

The steady integration of basic biological sciences with clinical and health sciences is gaining rapid momentum, with breathtaking technologies in newer generation sequencing, bioinformatics, cloud computing and nano technology- based biomedical applications, and molecular imaging. The spectacular new era will dawn much to our surprise earlier than we are used to, for paradigm shifts to take place.

It is indeed a far sighted step that our University has taken, in the establishment of the Genomic Laboratory as a Central Theme to our biomedical research activity and also to have established a faculty of Allied Health Sciences to usher in this new era. This step will greatly influence the quality of in teaching and clinical deliverables. It will also add great value to the careers of newer generations of graduates and post graduates. It surely may be expected to bring the value of “research culture” all across our institution to earn recognition by peers.

Such progressive development, best of all, will provide expectedly to the faculty, and the student community an intellectual tool to integrate into their teaching and learning process a vital new ingredient, the “Molecular Nature of life”, in health and disease the core of medicine in this century and thereafter.

REFERENCES

1. Kolata, G. New York Times, July 8, 2012 Glimpse of Future offered with new Leukemia Therapy.
2. Dewhurst K “An Oxford medical quartet Sydenham, willis, Locke and Lower “in oxford medicine (Ed: K. Dewhurst) p 23-31 (Sanford publication, oxford, 1970)
3. Weatherall, D.J. “Science in the undergraduate curriculum during the 20th Century “Med. Edu., 40, 195-201, 2006

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