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Expert Opinion - Uma Raghuram

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ELECTROPHORESIS

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Capitalizing on multi-dimensional services

Demand for electrophoresis is expected to rise as the drug discovery programs in India gain momentum due to several drugs nearing patent expiry

Ask any Mumbaikar for a particular address and rest assured, you would be given a list of easily recognizable landmarks first and then directions on how to reach the place. So also for me, a column on electrophoresis market trends in India means first an analogy which I can relate to, and from there to the subject. The Mumbai autorickshaws compare very well with electrophoresis - what with its size and shape being just right to wind its way through the snarling traffic, its CNG fitting boasting of an eco-friendly respite to the polluted city and also claiming to be purse-polite, while the driver himself with his experience of the lanes and by-lanes can ensure that you reach your destination, even when you give up telling yourself that you were lost! And what is more, it is in synchrony with modern information technology, with the most recent one being that the auto drivers could be employed to provide information on the traffic situation within the city! So is the scenario for electrophoresis, which is an integral part of almost every facet of research, whether it is molecular biology, genetics, microbiology and biochemistry, forensics or drug discovery. It is available in different sizes and shapes to address lab space constraints, fit all kinds of budgets, applications and with

scope to accommodate the ever-changing applications; not to mention the very many market players.

Current market scenario

The electrophoresis market is highly divided due to the inherent fragmented product portfolio that it encompasses. As a result, there are companies selling gel documentation and imaging systems, blotting units, power supplies and gels. The two major players are GE Healthcare and Bio-Rad, accounting for more than 50 percent of the market share, though this is a hazy picture as Hoefer, a global manufacturer of innovative electrophoresis instruments and consumables, not only sells its products directly and through distributors, but also through partnership with GE Healthcare. Invitrogen comes at the third position with 11 percent share and Sigma Aldrich has of six percent share. There are other key and niche players such as Agilent Technologies, Beckman Coulter, CBS Scientific, Dionex, Helena Laboratories, Lonza Group, Sebia, SERVA Electrophoresis, and Thermo Fisher Scientific. This is further compounded by the very many local suppliers and manufacturers of electrophoresis in the country like Bangalore Genei, Biomate, Genetix, Imperial Life Sciences, Suyog Diagnostics, Wheecon, and 25 or more such players.

Though there is no data available for the Indian electrophoresis market, one can arrive at approximations for the last year and these include the entire paraphernalia of the electrophoresis market, meaning the routine electrophoresis boxes, power packs, blotters, capillary electrophoresis systems, and related consumables. Therefore, electrophoresis market in India for 1-D and 2-D applications is roughly estimated at $6.5 million, while that for capillary should be around $4.1 million. Of this, GE and Bio-Rad together make up $3.5 million, while Invitrogen is at $0.8 million and Sigma Aldrich at $0.4 million and Hoefer at $0.35 million (again approximate figures), while Labnet, Major Sciences, Bangalore Genei and other local players account for the rest. The growth this year is expected to be 20 percent, meaning an overall figure of $12.72 million for electrophoresis in India.

Market segments

The electrophoresis market can be broadly divided into three segments: gel electrophoresis including the electrophoresis boxes such as blotters, gradient makers, power supplies, gel imaging systems, capillary electrophoresis, and electrophoresis gels and reagents. The electrophoresis demand broadly comprises of 29 percent of DNA electrophoresis systems and the remaining 71 percent of protein electrophoresis. However, the trend gets to be more complex if one were to split the demand depending on the industry it caters to. For instance, according to the Global Assessment Report 10.5, biotech and government research contribute to approximately 32 percent of the demand, followed by pharmaceutical labs at nine percent, while government testing labs are at eight percent, trailing ahead of agriculture and food and contract research organizations at seven percent and six percent respectively.

Another approach of following the electrophoresis demand trend would be on the basis of functions it serves - as per this report - basic research and applied R&D have the biggest demand at 55 percent, while analytical services stands at 18 percent, followed by quality assurance and control and methods development at eight percent and six percent respectively. Not included here are the teaching labs which are the highest consumers of 1-D electrophoresis reagents.

Opportunities and growth drivers

The recent elevated need for faster and economical ways to produce drugs for the pharmaceutical industry through proteomics, genomics, and synthetic chemistry research, has paved the way for biotechnology instrumentation. Growth is envisaged in almost all sectors pertaining to these areas of research and with the thrust on copy biologics and India's own preparedness in biosimilars; one can be rest assured of an increasing demand for electrophoresis. As the drug discovery programs in India gain momentum due to several drugs nearing patent expiry, the simplicity and robustness of protein electrophoresis platform provide researchers a concrete tool to accelerate such drug discovery experiments.

Not lagging behind is the diagnostics scene, where we have kits specially designed for capillary electrophoresis; with the most noteworthy being the HbA1c glycosylated fraction of haemoglobin. A Chennai-based company, Trivitron healthcare joins hands with Sebia to launch HbA1c kit.

Owing to cost-cutting demands to be competitive, attention is being focused on developing rapid and low analyte consumption systems such as those employing both separations and micro-fluidics technology. Much of this is based on innovations in electrophoretic separations exploiting electro-kinetic properties of analytes resulting in the burgeoning popularity of capillary electrophoresis.

The large installed base of users ensure that protein electrophoresis will continue to play a prominent role in molecular biology experiments, with emphasis on the development of newer imaging methodologies. Techniques such as 2-DE, that expand upon the fundamental principles of electrophoresis are also likely to be growth drivers.

Electrophoresis market is growing steadily at 20%

- Dr Uma Raghuram, senior applications scientist and regional manager-west, Spinco Biotech
Uma Raghuram has a masters in microbiology from Mumbai University and Ph.D from Anna University. She started her career in research at USV Ltd in the cell biology division, following which she joined Amersham Biosciences accepting a dual responsibility of applications and sales in lifesciences. She continued with GE Healthcare for the next seven years in various capacities. She has a few international publications, which adds to her credit.