

# With Indian Army as its biggest client, Axio Biosolutions is transforming trauma care

It was the year 2006. Leo Mavelly, who was then a student of Applied Biotechnology in Delhi, saw something that would drive him into entrepreneurship.

As a part of a volunteer project, he would help ferry victims of road accidents to the hospital. And one day as he was ferrying one victim, Leo noticed that he had a wound on his neck that was bleeding persistently. No amount of pressure helped stop the flow. Though the victim survived, that incident made Leo realise he wanted to do something in wound care.

Being a student of engineering, he already was working with polymer pastes, and when it was time for his final year project, Leo decided to work on wound care.

Explaining his focus on trauma care, Leo says:

For me it looked very primal and basic that there needed to be something that helped control bleeding. Even today people use cotton gauze and pressure to stop bleeding. There were very few companies across the globe that were working on trauma care and most of these were part of the US army.



Axio Team

## Putting pressure on the wound

This marked the beginnings of Axio Biosolutions, a trauma care and device company. Leo says that the idea was to make something affordable, which can be used without much training, and can be carried around easily.

Eventually, Leo ended up building AxioStat using chitosan, a natural biochemical. Working as an adhesive, AxioStat is a single-use, non-absorbable haemostatic dressing that can control bleeding in wounds, accidents, combat situations, capillary cuts, and stab wounds, venous and arterial ruptures.

Advertisement

**Axio Biosolutions today provides solutions to the Indian Armed Forces, and has its use cases in cardiology and dental care, as bleeding wasn't just restricted to trauma cases or road accidents. The company claims to have already sold over 1,00,000 packs of hemostats, and have an installed capacity of 2,50,000-300,000 units per annum.**

In cardiology, cuts are made on the radial artery and femoral artery during angioplasty. Unstoppable bleeding from the latter can be life threatening if unattended. Currently, there is one person who stands and applies pressure for close to half-an-hour on the wound. The patient is already on blood thinners, so the matter is worse. Axiostat reduces the pressure time from 40 to four minutes.

The product is designed in such a way that once applied to the wound it sticks to it, creates a gel-like substance, which ensures the wound gets the needed pressure while the natural clotting process continues. "It dissolves with washing, once on application and after a while the adhesive can be washed off. There is no remanence of the product as it dissolves in water," says Leo.

### **The long winding path of design and discovery**

Armed with the idea, Leo went to Ahmedabad in 2007 and decided to approach NirmaLabs, a high-tech incubator based out of Nirma University. The project got the approval of the incubator and was funded by DST – Department of Science and Technology. He began working on the project with Ashish Hitendrabhai Pandya.

Beginning 2008, the company was bootstrapped into existence, and Leo began working and looking at some different kinds of polymers, and decided to work with chitosan, a biopolymer used for treatment.

However, the team didn't have approvals to build medical devices, which meant they had to find a company that had permissions to build surgical devices. After ground work, Leo discovered Aegas, a surgical product manufacturer. Using their space, the team began work on building and manufacturing their product. "It made sense for us as the capital was already established on the built-up space, and had regulatory permissions," says Leo.

Another challenge that Leo faced was building a team that would work in a highly regulated market and yet have a great culture. Explaining this Leo says:

There are people who are experienced in building systems like this but are in large corporations. We knew that the US FDA and EU has regulations, and each researcher working on the device needs to have a defined qualification based on those regulations.

Today, the core team consists of Selvarasu MS, who was working with Stempeutics Research, and Sujit Sivadas who has over 13 years of experience with the Knee Product Development team at Stryker Orthopaedics in New Jersey, USA.

Kiran Sonaje who has over 9 years of experience in biomaterials and is also a senior post-doctoral fellow at University of Geneva and Gowri Maheshwari, who has over 10 years of experience in accounts, finance and taxation.

## **Bringing in the moolah**

In 2010, Axio Biosolutions raised seed funding from Ahmedabad-based GVFL and grants from DST. In 2012, the team got clearances to build the device for the India market and in 2013 they got the European clearance.

It was then that the team began selling the product to the Indian Army and the export markets. Leo says:

The major breakthrough came in 2014, when we cracked Indian Army sales. We became suppliers for the Northern Command, and the Border Security Force (BSF).

Today, the defence forces contribute to half of Axio's business.

Last year, Axio Biosolutions also raised an undisclosed amount of Series-A funding from Accel Partners and IDG. According to Axio's RoC filing, the company made a total revenue (without calculating expenses) of Rs 5,541,281 last year.

Barath Shankar Subramanian, Principal, Accel Partners believes that the medical devices market in India is in its fairly nascent stage, especially in the startup sector. However, companies have demonstrated that it is possible to build world-class products with great IP to cater to India as well as the global market.

"We are seeing the market open up to supporting innovation and trying out products that are being built, keeping the Indian consumer in mind while at the same time having global ambitions," adds Subramanian.

This year the team intends to build a new 20,000-sqft manufacturing setup in Ahmedabad. They currently are working on getting the US FDA approvals and audit, and the team already has the ISO C ranking. The unit has an expanded capacity of an addition 2,50,000 units per annum.

Subramanian remarks:

Axio is well-poised to be an innovative company in the area of wound care and management not only in the case of trauma but also other interesting applications and we see them transforming into a global player in this space.