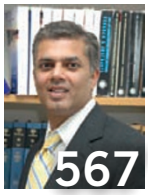
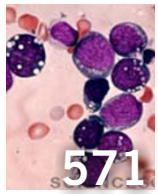


Islet of the storm:
More human islets needed to enable diabetes research

Bio defense:
DARPA opens a new Biological Technologies Office



50 years on:
Vaccines advance half-century after Epstein-Barr virus discovery

First Chinese-made biologics slated for human trials in the West

More than 70% of novel biologics are developed in the US or Europe, and they are mostly made and sold in Western countries. Companies in China are keen to catch up, and a recent deal has signaled a big forward leap.

On 8 April, a French drugmaker called Immutep announced that its compound IMP321, an immunomodulatory fusion protein in late-stage development for treating cancer, will be produced in China by WuXi AppTec, a contract manufacturer based in Shanghai. It would be the first biologic made in a Chinese facility to be imported to Europe for clinical trials. On 5 May, WuXi also said that ibalizumab, an HIV drug it is making for the Taiwanese company TaiMed Biologics, would be the first Chinese biologic to be usable in human clinical trials in the US.

> "Five years ago, no one would have been talking about manufacturing in China...but now, it is accepted that it's the place to go."

As products generated by living systems, biologic medicines are tricky things to make. And until recently, biologics manufacturing in China would have been extremely difficult. Few local companies had the technical expertise to make sophisticated products. Moreover, loose regulation made consistency a worry: China did not require current good manufacturing practices (cGMP) for locally sold products until 1988. Manufacturing of drugs in China has only been brought closer to American and European standards in the last few years.

The tide is changing in large part thanks to government support. In 2010, the Chinese government named biotechnology one of seven "strategic emerging industries" targeted for growth. The state grants the industry generous tax subsidies and encourages collaboration with foreign partners. The same year, China's Food and Drug Administration (CFDA; formerly known as the SFDA) tightened its rules for cGMP within the country. This has helped elevate quality. "Five years ago, no one would have been talking about manufacturing in China," says Frederic Triebel, Immutep's scientific and medical director. "But now, it is accepted that it's the place to go."

Yet biologics manufacturing in China remains embryonic. "The SFDA is moving to get the quality processes up to US and EU cGMP standards, but there is still a ways to go," says Eric Langer of BioPlan Associates, a Maryland-based pharmaceuticals business consultancy. As of 2012,just seven companies in China were capable of producing recombinant proteins, and only two were making monoclonal antibodies, according to Thomson Reuters, a research firm. Though this number may have grown, progress is "sluggish," says Langer.

Lost in translation

Chinese cGMP standards also do not count in Europe or the US, which each have their own requirements. "The Chinese GMP standards tend to focus on personnel qualifications rather than the quality of the production process," says Lei Li, a Beijing-based lawyer with the American firm Sidley Austin. "So being in compliance with overseas standards is a bit different."

Some Chinese companies have managed to make small molecules in line with Western cGMP compliance. The US Food and Drug Administration lists 517 Chinese makers of these products registered with the agency. But no biologics made in China have yet become available in the West. Analysts reckon that WuXi's two clinical trials products are the closest.

A handful of other Chinese companies are hoping to one day become biologics suppliers for the West. In 2010, Autekbio, a Beijing- and California-based company, received $100 million from private and government funds to build a US and EU cGMP standards facility capable of preparing preclinical and clinical biologics. It was expected to open this year but has been delayed. Pacific Meinuoke in Changzhou and Genor Biopharma and KanDa Biotechnology, both of Shanghai, are in the midst of similar construction projects. Some of these companies have signed with foreign ones to develop therapeutic agents in earlier stages.

"I was surprised to find that the price of manufacturing biologics in China is about the same as in Europe," observes Triebel. "But their competitive advantage is a clear commitment to success." That is, a combination of government investment and regulatory improvement has convinced foreign firms to come to China and has spurred growth in domestic ones. As the industry matures, prices are likely to come down.

More partnerships with Chinese companies are happening for all stages of drug development, providing another reason to think about manufacturing there. Immutep, for example, is collaborating with another Chinese firm, Eddingpharm, on developing IMP321 in Asia. But it will be some time before Chinese companies, or those in any other emerging Asian countries, are exporting biologics for patients abroad (no Indian-made ones are sold in the US or EU currently; Japan produces mostly for its domestic market).

According to Langer, however, it is poised to happen. "It's a matter of developing the opportunity that is clearly there," he says.

The global biologics market has grown from 11% of total drug sales in 2002 to 18% in 2012, estimates IMS Health, a research firm. It is expected to be 20% by 2017, with a growing portion from novel products. The recent deals with WuXi may be a hint of where many biologics will be made.

Boer Deng