

Flush with capital and cheap researchers, India is primed to do the world's grunt work in yet another high-tech sector

By Ian MacKinnon

BIOTECH BOOM

IN HIS LONG, TORN shorts and beach slippers, Mugasimangalam Raja looks like the typical dot-comer. Or at least like typical Indian dot-comers, tens of thousands of whom have proliferated across the Subcontinent and the world during the information-technology boom. Raja, too, sought his fortunes abroad—first at a firm in San Diego, California, then across the world in Tel Aviv. Last year, like many other Indian entrepreneurs, he returned to Bangalore to found his own company.

Raja's start-up is called Genotypic Technology, and its mission involves not coding software but decoding what genes are involved in particular illnesses. As some of the shine has worn off India's IT sector, more and more investors and entrepreneurs are zeroing in on work like this; biotech now looks to be the next high-tech field in which Indian companies can thrive by performing unglamorous services for researchers in the West. India already has 800 biotech firms. With venture capitalists looking for new places to park their money, that number is set to grow dramatically in coming years. "When I first came back, it was for patriotism," says Raja. "Now it's business first and patriotism next. It's absolutely the right moment to start—all the companies that put money into IT want to get into this."

They want to do so for very similar reasons. As with IT, government support for biotech has helped produce a vast pool of cheap, highly educated researchers. In recent years the government has funded 52 centers across the country to collect data relating to the Indian genotype. And research institutions and universities produce up to 1,000 biotech postgrads each year—second only to the United



NATURAL RESOURCES: India's rich biodiversity is a gold mine for biotechnology companies

States. According to some estimates, as many as 15 percent of all biotech professionals in America are Indian.

India has other natural advantages in biotech. The country's incredibly diverse flora and fauna offer a potential gold mine of raw materials. A century ago on the Ganges River, phages—water-based agents that inject their DNA into bacteria cells, disrupting the cells' genetic codes—were found to be effective against diseases like cholera and bubonic plague; now that resistance to modern antibiotics is increasing, a Bangalore start-up called Gangagen is re-evaluating the potential of phage therapy. Chennai-based ABL Technologies hopes to produce blood-clotting agents from seaweed in the Bay of Bengal. Mumbai pharmaceutical giant Nicholas Piramal has linked up with a state-run research lab in Jammu and Kashmir to analyze the medicinal properties of Himalayan plants.

Even the nation's gene pool has rich potential. Clusters of isolated genes can be found within intramarried castes and remote tribal groups, while India's vast number of diabetes sufferers—predicted to grow to 20 million by the end of the decade—gives researchers analyzing genetic links to the disease a wealth of material to work with. "It's a numbers game," says Piramal's Harvard-educated scientific-research head, Swati Piramal. "We've lots of scientists and lots of patients."

And lots of business. As in the rest of the world, India's biotech sector received a huge boost from the sequencing of the human genome last year. The mass of raw data that has emerged from the Human Genome Project has given researchers thousands of

leads to pursue. The work may not be sexy—it usually involves finding clusters of patients who are related and identifying which common genes may be responsible for their conditions, like diabetes. But it is attractive both to investors, who appreciate its stability, and to young companies. "With this work you learn while you earn," says Kiran Mazumdar Shaw, managing director of Biocon India.

Perhaps most important, after five years of white-hot growth in IT, India now has the funds to support a flourishing biotech sector. "I think venture capitalists will jump-start the biotech space in the next six months," says Subhash Reddy, vice president of the \$125 million e4e fund, based in Santa Clara, California, and Bangalore. ICICI Ventures has invested between \$1 million and \$5 million in three companies over the past year, and e4e recently signed a deal with a Bangalore bioinformatics firm. Venture capitalists now see approximately 10 business plans a month in Bangalore, compared with zero last fall. The bandwagon is set to roll. ■