

Pacific sunrise

The Pacific Northwest of North America doesn't just mean Microsoft, Intel and some big trees. Already noted for the quality of its biological research, the biotechnology base in cities such as Vancouver is set to grow too, as **Virginia Gewin** finds out.

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REASONS

Stretching from Vancouver in British Columbia to Oregon, the Pacific Northwest may not be the richest or the largest technology cluster in the world, but it has a flavour all its own.

Home of the Bill and Melinda Gates Foundation, with its commitment to global health, the city of Seattle brings an idealistic spirit to science and technology. Add some world-class medical and scientific institutions, and the region is fast developing into an influential centre for the life sciences. The public sector still offers the greatest number of jobs, but the private sector is growing.

The Pacific Northwest of the United States and Canada — Washington, Oregon and British Columbia — has given birth to industry leaders. From Microsoft to Amazon, technology is key. It comes as no surprise that the medical charity established by Microsoft co-founder Bill Gates is one of the driving forces of the region's current biomedical boom.

"The importance of the Gates Foundation and its emphasis on global health cannot be overstated," says Nancy Haigwood, viral vaccines programme director



Bill Gates: foundation funding is driving the boom.

at the Seattle Biomedical Research Institute (SBRI). Non-profit organizations strong in immunology and vaccine research, such as SBRI, have received significant chunks of the Gates' Grand Challenge grants. SBRI alone has been awarded Gates grants of \$47.5 million since 2000. That influx of funds is still producing job opportunities, particularly in the field of infectious diseases. In 2000, there were only five malaria researchers in the SBRI's Malaria Antigen Discovery programme. Now, there are more than 60 — with more due to be recruited.

Headquartered in Seattle, the non-profit organization Path focuses on promoting sustainable international health technologies. As a result of Gates funding it has 60 open positions worldwide in areas as diverse as microbiology to vaccine development. The people at Path are also excited by the recently launched Gates-funded Department of Global Health at the University of Washington in Seattle. The university is a powerful force in the northwest and is the largest life-sciences employer in the region, followed closely by the Fred Hutchinson Cancer Research Center.

At the Seattle-based Institute of Systems Biology (ISB), the non-profit research institute founded by sequencing innovator Leroy Hood, a \$13-million grant from Gates and California-based pharmaceutical giant Amgen will help fund research on the prediction and prevention of disease.

The Allen Institute of Brain Science in Seattle, set up by Microsoft's other founder, Paul Allen, is set to finish the \$100-million Allen Brain Atlas this year. The institute will be hiring systems neuroscientists and data managers for the next phase of work — mining the atlas data on brain circuitry and gene expression and an in-depth study of the cortex.

The region's homegrown biotechnology industry has had a less successful time recently, battered by lay-offs and acquisitions such as that of Corixa by GlaxoSmithKline. The area has been noted for

NORTHWEST NANOFUTURES

The Pacific Northwest also aims to make a name for itself in nanotechnology. Set up in 2001, the Pacific Northwest National Lab (PNNL)-University of Washington joint institute for nanoscience has the aim of furthering research and education in the field. The university's Center for Nanotechnology boasts the first PhD programme in nanotechnology in the United States, funded by a National Science Foundation-Integrative Graduate Education and Research Traineeship (NSF-IGERT).

State leaders are building on Oregon's reputation as the 'silicon forest' of semiconductor-based industry to develop nanotechnology. The recently established Oregon Nanoscience and Microtechnologies Institute (ONAMI) is a collaboration between Oregon universities, PNNL and companies including Hewlett Packard at Corvallis and Beaverton-based electronics firm Tectronix. ONAMI recently received \$28 million in state funding to raise additional funds for these fields. The University of Oregon in Eugene is leading the training effort with its new Materials Science Institute, complete with an NSF-IGERT for MS and PhD training at the interface of chemistry and physics.

V.G.

HOTSPOTS

Seattle

Health-related research is expanding in Seattle, with many institutions in the midst of construction to house their growing staff. Starting in 2008, the Washington Life Sciences Discovery Fund will have \$35 million annually to disburse for ten years, potentially creating many new jobs.

California-based pharmaceutical company Amgen plans to take a healthy helping of local talent at its facility in Seattle (pictured below). Richard Farley, Washington director of human resources for Amgen, says it plans to recruit 150 employees over the next year to grow their drug-discovery pipeline — that is a 15% increase in the workforce, primarily in research positions.

Portland

Compared with its neighbours on either side, Oregon's foray into the life sciences could be viewed as baby steps.

But the recent \$500-million public-private investment in Portland's Oregon Health and Sciences University (OHSU) — the Oregon Opportunity — was a tremendous leap towards the state's goal of obtaining its share of the bioscience industry and converting research into clinical reality. The OHSU is halfway through recruiting 70 principal investigators and staff to fill the new 25,500 square metre biomedical research building that will serve as the cornerstone of the project.

Vancouver

Vancouver may be only the eighth largest life-sciences cluster in North America, but its companies offer the highest rate of return to investors. George Hunter, president of Vancouver-based Leading Edge BC, which

promotes technology in the region, credits British Columbia's progressive government policies for their impressive stats. In addition to a tax-credit programme that makes Canada a low-cost place to conduct research, business skills get specialized attention. Leading Edge has developed a one-year mentorship programme called BC Excels to address the skills needed by the biotech community.

Vancouver companies have also shown that they can attract talent in their own right. OncoGenex, which is developing drugs for hard-to-treat cancers, has opened an office in Seattle, having hired some of the clinical team from Corixa, a Seattle-based biotech company that recently merged with pharmaceutical giant GlaxoSmithKline. V.G.



bioinformatics, through companies such as Merck subsidiary Rosetta. But that wave may have crested, according to Randall Schatzman, chief executive of antibody developers Alder Biopharmaceuticals of Bothell, Washington, who suggests that Seattle's 20-year history of protein therapeutics and immunology are what will carry it into the future.

That future includes long-time Seattle protein therapeutics company ZymoGenetics, and big pharma in the form of Amgen and Wyeth. Based in Madison, New Jersey, Wyeth Pharmaceuticals recently signed a deal, potentially worth \$800 million, with Seattle start-up Trubion Pharmaceuticals. They plan to use Trubion's protein-assembly technology to develop a new class of drugs to penetrate tumours and diseased tissue. Many in the region see this as the beginning of a revival for the biotech industry.

Seattle is also taking a new approach to company creation. The ISB serves as the institutional anchor for the Accelerator — a private investment and biotech development company that partners top investors with dedicated management and scientific leaders. The experiment has so far created five companies in its three-year existence.

On the Canadian side of the border, Vancouver also aims to turn university research into industry gold, although like its American neighbours it has suffered from an early dearth of capital investment. "Vancouver is becoming a favoured target for company acquisitions by global multinationals — a place we're happy to be," remarks George Hunter, president of Leading Edge BC, a non-profit organization dedicated to promoting British Columbia as a technology hub. He is excited by the trend for biotech pioneers to become serial entrepreneurs.

Vancouver's prowess in biotech is considerable. Of only 19 profitable biotech companies worldwide, three are in Vancouver. More than 70% of the industry is biopharma, and niche areas, such as oncology, HIV and AIDS research, and bioinformatics, have seen much growth recently, agrees Karimah Es Sabar, executive director of BC Biotech, a regional industry organization. Scott Cormack, chief executive of drug developer OncoGenex, adds that Vancouver is reaching a critical mass necessary for a thriving biotech industry.

One driver of Vancouver's biotech is a heavy focus on genome sciences, particularly research into disease biomarkers. The government-sponsored funding agency Genome BC has invested more than Can\$273 million (US\$236 million) on biomarker research at academic institutions — ranging from identifying cancer-causing mutations to using genetic fingerprints to reduce adverse drug reactions in children — and on developing platforms combining bioinformatics, proteomics and genetic mapping.

Although scientific talent is abundant in the Pacific Northwest, there is a constant demand for those with clinical, regulatory or quality-control skills. Even more important for start-ups is to find a seasoned director to guide the business. "Finding skilled management remains the biggest challenge here," says Gabe Kalmar, executive director of operations at Genome BC.

The Pacific Northwest offers vibrant career options. Former University of Washington president Lee Huntsman's take on Seattle goes for the whole region: "It's big enough to be stable, but it's not at all set in its ways."

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WEB LINKS

- University of Washington
www.uwashington.edu
 Fred Hutchinson Cancer Research Center
- www.fhcrc.org
 Seattle Biomedical Research Institute
- www.sbri.org
 Path
- www.path.org
 Genome BC
- www.genomebc.ca
 Leading Edge BC
- www.leadingedgebc.ca
 Oregon Health & Sciences University
- www.ohsu.edu
 ONAMI
- www.onami.us
 PNNL/UW Center for Nanotechnology
- www.nano.washington.edu