

# Monica's Garden: R&D in the Biotech Cluster in Vancouver

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# Why Biotech and not Health Industries?

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- **A large proportion of health sciences workers (which includes professionals, technicians and support staff) are engaged in providing health care services to the population of the region.**
- **For the most part, health care has to be delivered where the population lives, but research takes place where the best facilities exist.**
- **In most countries, including Canada and BC, health services are provided by predominantly public sector and/or not-for profit institutions.**
- **By contrast the biotech industry is overwhelmingly private sector, is highly mobile, and is governed by market forces.**

# The Life Sciences Industry

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- **LifeSciencesBC report that there are about 2600 individuals working in the life sciences industry (as opposed to health sciences, 62,455 according to StatCan), and about 100 companies**
- **So where is the life sciences R&D done in BC? Some (approx \$50M/yr?) is done in the public sector, but there is some evidence to suggest that almost ten times as much is done by firms in BC. Measurement issues abound.**
- **There are many incentives to move IP from the public sector, from UBC (in particular), to spin-off companies**
- **This brings in private entrepreneurs into research – venture capitalists, stock promoters, intellectual property lawyers, etc.**
- **How and why does this ‘innovation system’, flourish?**

# Monica's bio-tech garden

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- **At UBC there is fertile soil (facilities). The seeds (ideas) are planted by basic research.**
- **The federal government supplies the rain (money) that makes the seeds germinate and start to grow.**
- **The plants grow and start to flower (small, start-up, enterprises)**
- **More fertilizer, and pruning comes from the gardeners (entrepreneurs)**
- **The gardeners come along, cut the flowers and take them off to the flower shop (larger companies) to sell!**

# The biotech cluster in Vancouver

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- **This is a global cluster: its inputs and outputs both are part of the global market. Yet it is not a large industrial cluster by international standards. Why does it exist at all?**
- **The main input is human capital: a pilot study showed that one-third are from BC, one third from the US and one third from the rest of the world, including the rest of Canada**
- **Its outputs are intangible. There is very little actual manufacturing in Vancouver. And there is little in terms of biotech services exported, except as IP.**

# Observed Inconsistencies

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- In theory (see Porter) local city-based systems of innovation should fit local competitive, market based, advantages
- But there are clearly local innovation systems that are not based on product-based competitive advantages
- Why should a “super-creative” person (see Richard Florida) want to live in high-cost, high tax, low commercial activity environments?
- Florida’s evidence suggests that “super-creatives” choose their place of residence, and then choose their employment
- Similarly super-creatives look for (or perhaps create) a ‘sticky’ labour market

# Inputs – Human Capital

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- **High-tech industries need human capital. But super-creative human capital sells its skills on a global market**
- **Vancouver must be competitive in that market.**
- **Data show that UBC, in particular, has a high provincial retention rate, in that the percentage of UBC grads who stay in the province is gradually increasing.**

# Linkages outside the GVRD

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- **Most Vancouver high-tech HQP/firms report that they have local peer-to-peer relationships with other local HQP/firms**
- **In terms of inputs to their activities they go wherever talent and IP is available.**
- **Thus there is no distinction (to them) between Calgary or Raleigh, NC, or the rest of the world as sources of talent or IP.**
- **These firms are operating in a global market for inputs, primarily human capital, and thus must compete for that talent globally**



# The global market for entrepreneurs

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- **Natural resources are marketed globally. Commodity prices are driven by the global market regardless of the costs of production.**
- **Manufacturing is still constrained by geography – most manufacturers' markets are within national or continental markets. The exception is consumer goods, where the unit value far outweighs the transportation costs (e.g. electronics)**
- **This is gradually breaking down – large manufacturing chains (autos, aircraft) are global in scope, not continental**
- **High-tech entrepreneurs do not have this luxury. Most high-tech products are sold on the global market; there is no smaller market open to them**

# Outputs

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- **Most high-tech firms have very thin markets locally – they sell globally.**
- **In Vancouver, this ‘selling’ is not usually goods, in the conventional sense.**
- **It does appear that Vancouver’s real expertise is in developing and selling intellectual property (IP).**
- **Vancouver’s ‘niche market’ appears to be in the development of IP to the point at which it can be acquired, manufactured and sold by a globally competitive product firm.**

# Constructive Destruction

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- **The ISRN 1 project suggested that local innovation catastrophes, such as the closing, or downsizing, of a major innovative core company (such as NorTel) may, under certain circumstances lead to the creation of new spin-offs, some of which survive.**
- **The survival rate of these spin-offs is often low, but the overall addition to local innovative human capital is extensive.**
- **The likely explanation is that in such places (eg Ottawa and Vancouver) the labour market is sticky, and that households have enough economic resilience to allow one partner to become entrepreneurial, at least for a couple of years.**

# What should Vancouver do?

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- **It does appear that we have a real competitive advantage in HQP intensive industries**
- **What should the various levels of government do? What do super-creatives want?**
- **Not only must we maintain our quality of life attributes : some are natural – mountains, climate, but some we can influence – outdoor recreation facilities, theatre, etc.**
- **We also must provide infrastructure that supports and attracts this human capital base: schools, hospitals, cultural and transportation facilities. Support for research, in particular, is part of this infrastructure.**
- **But not only do we need institutionalized facilities: HQP enjoys (see Florida) “Bohemian” resources: eg: Commercial Drive**

# Vancouver as a Gateway and “Pivot”

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- Vancouver is almost unique as a regional innovation system in North America: we are not self-contained; we are dependent upon our transportation links. We are a “pivot point” between North America and Asia, unlike many of the other high-tech cluster areas in Canada and the US.
- In biotech, our continental competition is San Diego, which has similar attributes.
- There are closed regional systems on the Pacific rim, “city-states” such as Singapore & Hong Kong, and some large Chinese port cities, but very few are gateways to larger systems of innovation (unlike Pusan, Korea which is a very close analogue to Vancouver).
- The key question to any super-creative R&D entrepreneur or employee in BC: *“Is there any other place you would rather be?”*