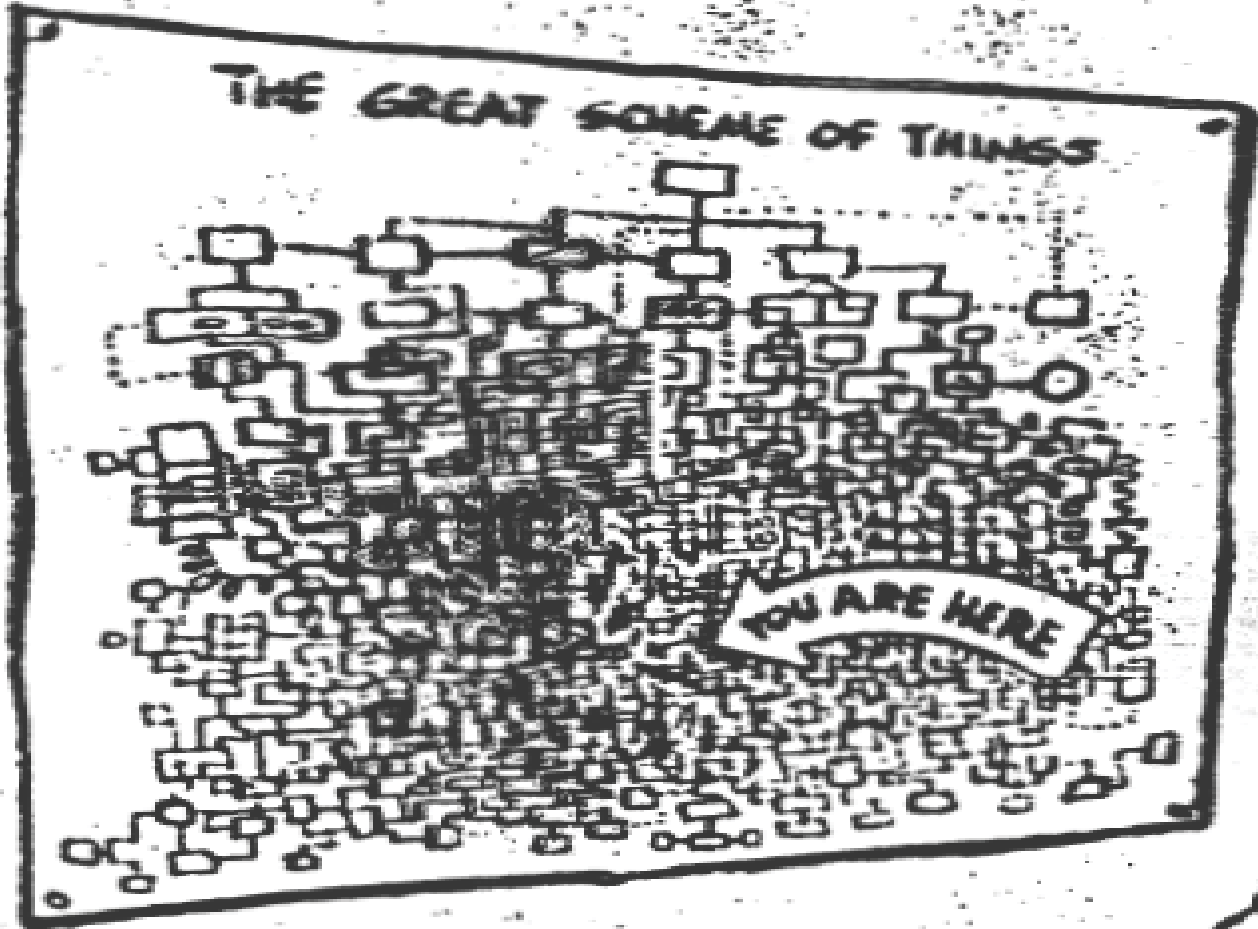


Opportunity and Impact through Knowledge Transfer and Commercialization

A perspective from “the trenches”



CSG MASTER PLAN



don
advis

Creating Opportunity and Impact

Knowledge Transfer

Knowledge Translation

Knowledge Exchange



Adding value – reduction to practice



Technology Transfer – transfer of rights



Commercialization

What is intellectual property?

The natural result of research; includes data, inventions, know-how and publications.

- Patents – for inventions that are new, useful, innovative.
- Copyright – for original literary, artistic, dramatic and musical works.
- Trademarks – for words, symbols and/or designs used to distinguish the goods or services of one organization from another.
- Industrial Design Registrations – for the shape, pattern or decoration of products, whether made by hand or by machine.
- Integrated Circuit Topographies – for three-dimensional configurations of electronic circuits embodied in integrated circuit products or layout designs.
- Plant Breeders' Rights – for new plant species, except algae, bacteria and fungi, that are distinct, uniform, and stable.

Assessment

How does one evaluate that there is competitive practical potential in a new idea or area?

<http://www.innovations.utoronto.ca/>

Ownership Assessment

- Who are the inventors? (inventors, not authors)
- Who else is involved?
- Who could think they were involved and therefore exert ownership claims?
- Who paid for the research? Do they have rights to the invention?
- Has it been disclosed?

Freedom to Operate Issues

- What is the closest prior art?
- Would practicing this invention infringe another technology? (not necessarily a “terminal illness” if the answer is yes)

Science and Technology Issues

- Is the technology practical, simple, easy to describe in lay terms?
- Is it breakthrough technology, or is it better described as an improvement of an existing technology?
- What is the stage of development of the invention (e.g. lab bench, prototype, etc.)?

How can you determine whether an invention is marketable? Hallmarks:

- Your product does something existing products do not do, or it does something better than an existing product.
- Testing has determined that the product works, or you have promising initial test results and can reasonably predict when your testing will be complete.
- You have a prototype, proof-of-concept or other tangible result. This shows your invention is advanced and makes evaluation easier for a potential business partner.

Commercial Potential

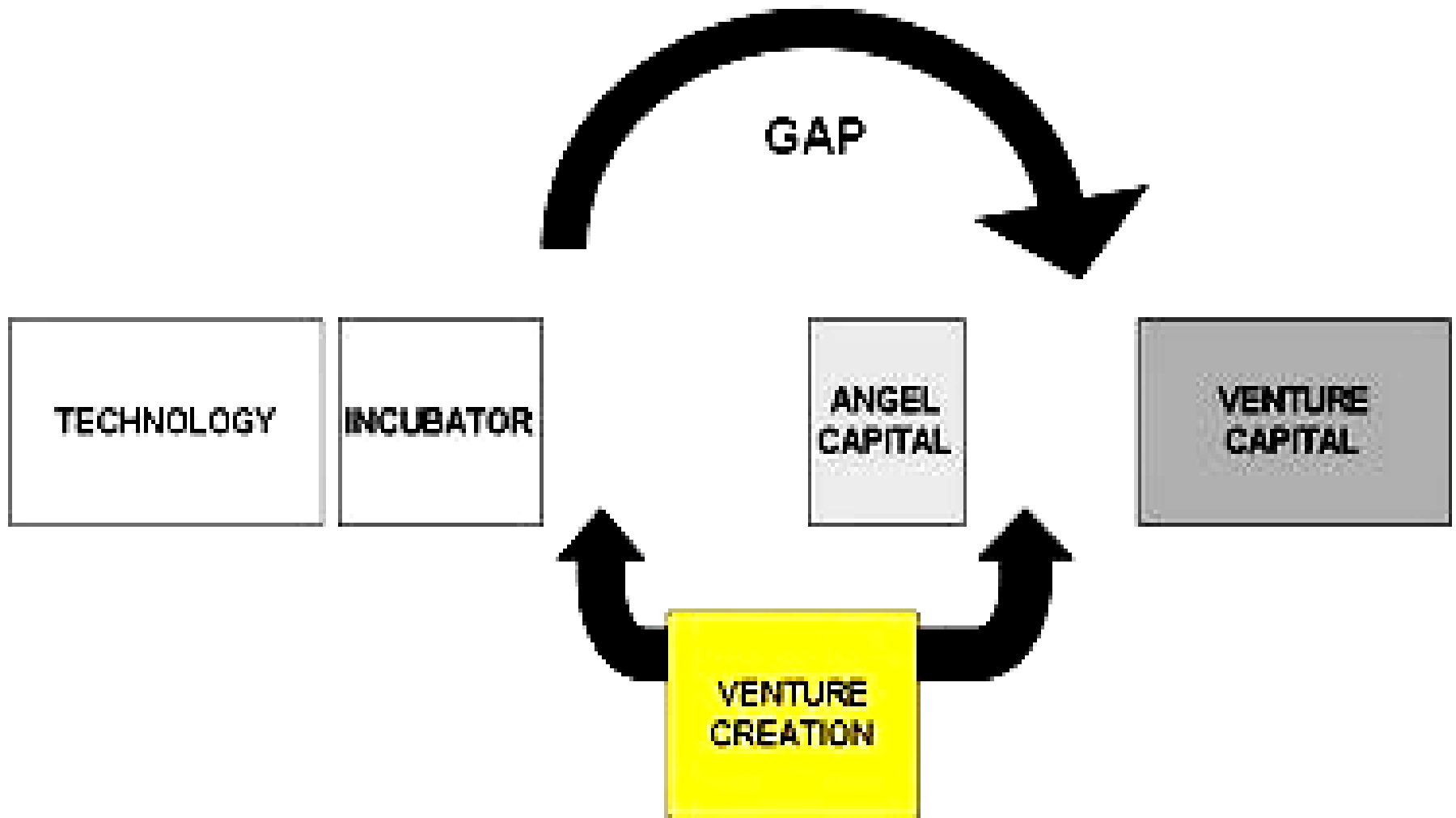
- Is it easy to describe the "pain" in the workplace, which this invention would address?
- Are there solutions to the market need, which this technology would aim to displace?
- What is the best current alternative to using this technology today?
- What special milestones need to be achieved before a commercializable product can be developed?
- How big is the market and how long would it take to bring the product to the market?

The Commercialization Process

**Many steps, many pitfalls,
and for some;
an accomplishment in reward
that is *monetary*,
and that
transcends monetary value**

*My personal quandary – impact is primary; monetary is secondary –
unless there is opportunity for research funding.
I will not become an entrepreneur; but can still play in the
“commercialization arena”*

Is the issue only money?



The Gaps

Knowledge – to – Commercialization

- **The technology gap**
(need inventors to demonstrate commitment)
- **The funding gap**
(need inventors to demonstrate commitment)

IP Management

- payment of all IP protection expenses during initial phases (OPiuM – Other People’s Money)
- IP assessment – patentability, prior art, competition etc.
- liaison with patent agents
- increasing the strength and breadth of the protection
- development of IP strategy: which countries, alignment with business strategy, etc.
- resources for IP litigation if necessary and appropriate

**Provisional filing – few thousand dollars; a placeholder
US, Canada, PCT – many tens of thousands of dollars**

Commercialization Strategy

To license, or spin-out? Size of opportunity, scale of effort?

Spin-Out:

- no evident receptor
- technology too early
- large company nimbleness? merger versus new

Licensing:

- scoping and review of industry supply chains
- identification of licensee(s)
- upfront payments, milestone based (value), royalties

Business Strategy

- development of preliminary business strategy
- development of an advisory team to access market and business expertise (get the best!)
- development of business plan and communication materials (get help!)

Project Execution

- establishment and negotiation of legal agreements: licensing, incorporation, shareholders etc.
- establishment of required banking and accounting procedures
- interim administration of business
- management of licenses and contracts
- strategic alliances and partnerships
- sourcing of all relevant governmental match-funding

Project Execution - Funds

- NSERC (CRD), NSERC (I2I), CIHR (POP), OCE, IRAP, NCE
- Institutional
- Ontario Commercialization Investment Fund, MRI
- Angels
- Venture Capital

Types of Benefits to Consider

“Grants”:

- IRAP contributions (up to 50%)
- SDTC (~33% - 50%)
- Training

Tax Credits:

Federal gov't to industry (e.g. SR&ED)
Provincial gov't to industry (e.g. OBRI)

Tax Exemptions:

e.g. Ontario retail sales tax exemption on R&D equipment

Enhanced Deductions:

e.g. Quicker write-offs of R&D capital

“Loans”:

- NextGen Biofuels Fund (up to 40%)
- Transformative technologies
- Clean energy

SR&ED: Eligibility Considerations

SR&ED: “Scientific Research and Experimental Development”. The government is looking for **three key criteria** to be met:

- Scientific or technological **advancement** (e.g. advancing the technical knowledge base of your company);
- Scientific or technological **uncertainty** (e.g. solution not readily apparent); **and**
- Scientific and technical **content** (e.g. systematic investigation, iteration, reasonably documented).

Other Opportunities – Can be Province Specific

More Tax Credits and Exemptions

- Refundable 15% Co-operative Education Tax Credit (credits of up to \$1,000 for qualifying work placement)
- Capital tax exemption on qualified expenditures

Enhanced Deductions

- New Technology Tax Incentive, a 100% immediate write-off of the eligible cost of qualifying intellectual properties acquired in the course of an IP transfer

Operational Funds

- Investment Accelerator Fund
- Venture Capital Fund
- Innovation Demonstration Fund
- Youth Employment Program up to \$12k in grad's salary

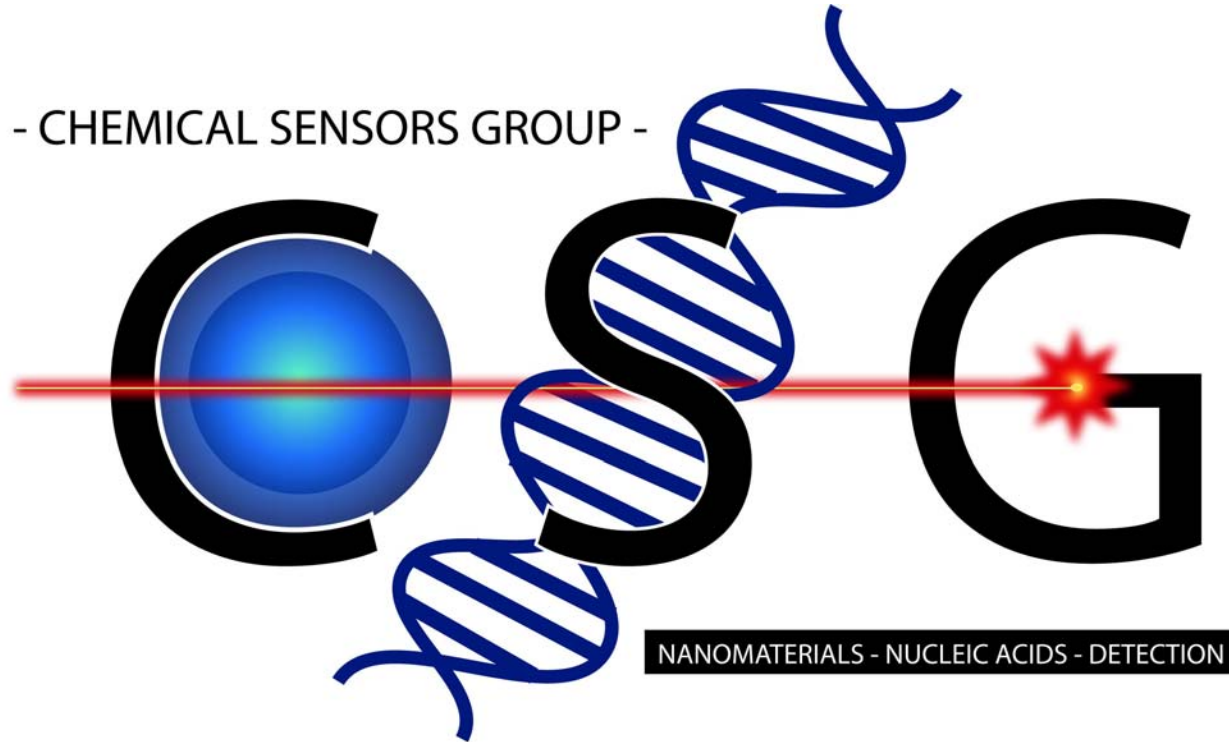
Sales and Marketing

- development of appropriate marketing and sales collateral for initial sales
- identification of key strategic clients
- securing early license or sales contracts and relationships
- closing of sales, contract finalization and management
- application for vendor status (i.e. for government contracts), which may require the supply of financial history

CRUCIAL – NO DISTRIBUTION; NO REASON TO BE IN THE GAME

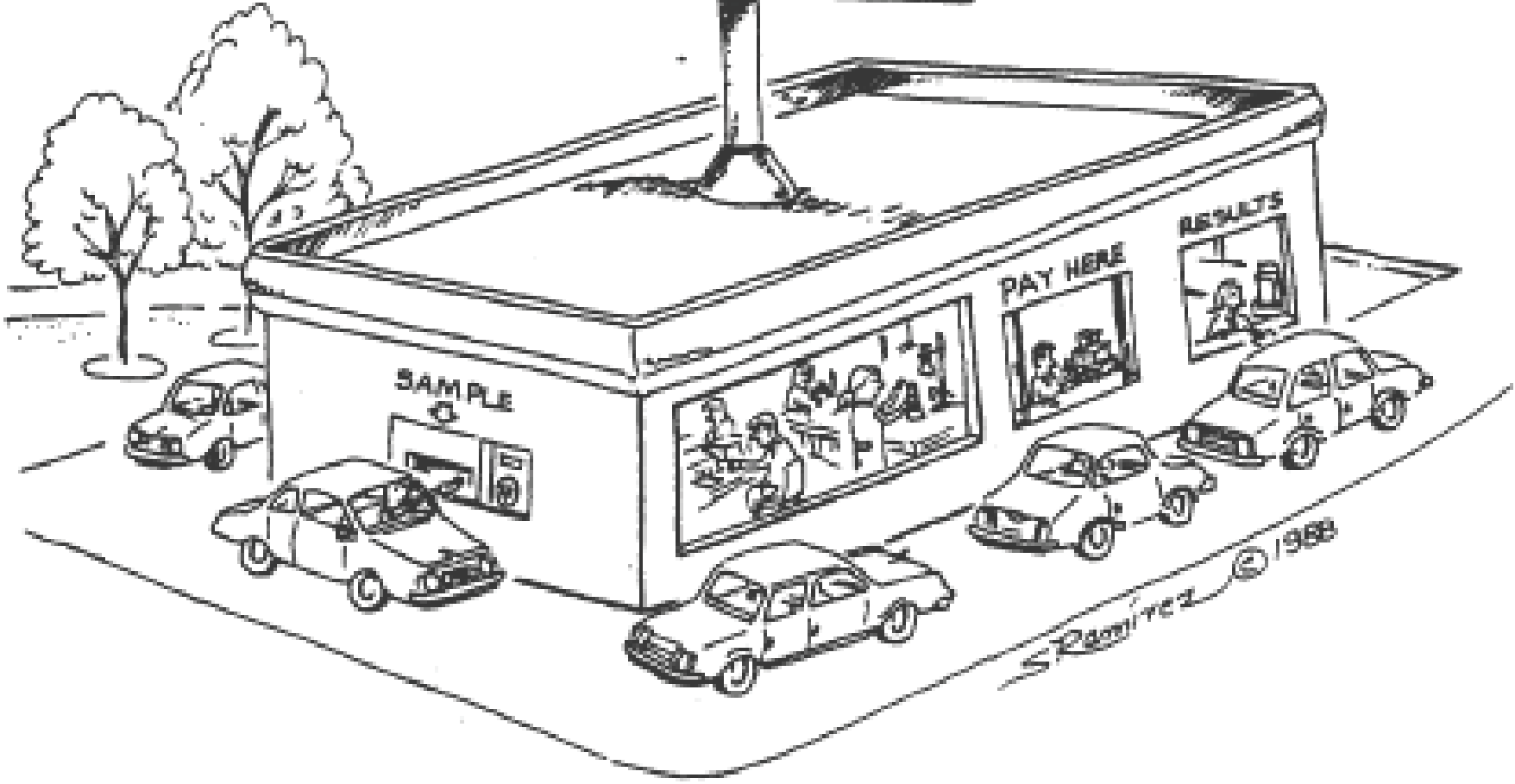
Some Examples of My Experiences

- CHEMICAL SENSORS GROUP -



NANOMATERIALS - NUCLEIC ACIDS - DETECTION

**QUICKIE
LABS**
* DRIVE THRU *

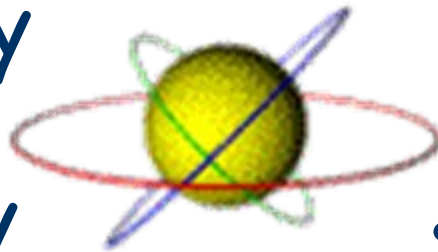


The Biosensor Concept



Properties of biosensors :

- Sensitivity
- Selectivity
- Dynamic range
- Suitability for commercialization
- Stability
- Detection limit
- Reproducibility
- Response time



Three Case Examples

- 1980's: NSERC Discovery IP (sold), to NSERC CRD with Allied-Signal (OPiuM), to Canadian DND, then a start-up based on single technology; lipid membranes by Paradigm Biosensors, IP lost.
- 1990's: NSERC Discovery IP (licensed), to Advanced Biological Products (OPiuM), then start-up based on single technology; fiber-optic nucleic acid sensors by FONA Technologies, Inc., to Virtek Vision, Inc., with OMAFRA and Genome Canada funding, to Bio-Rad Inc., IP back to UofT.
- 2000's: NSERC Discovery IP (licensed), to NSERC Strategic, a strategic component of multi-technology platform by Safeguard Biosystems (OPiuM).

Cultural Issues



"Mr. Mover meet Ms. Shaker!"

Cultural Issues – The Investors

Investors need to understand:

- IP takes time and money
- Need to fund ongoing commercially relevant IP and R&D
- Researchers desire and may require freedom to publish
- Researchers desire freedom to pursue their research and control their IP

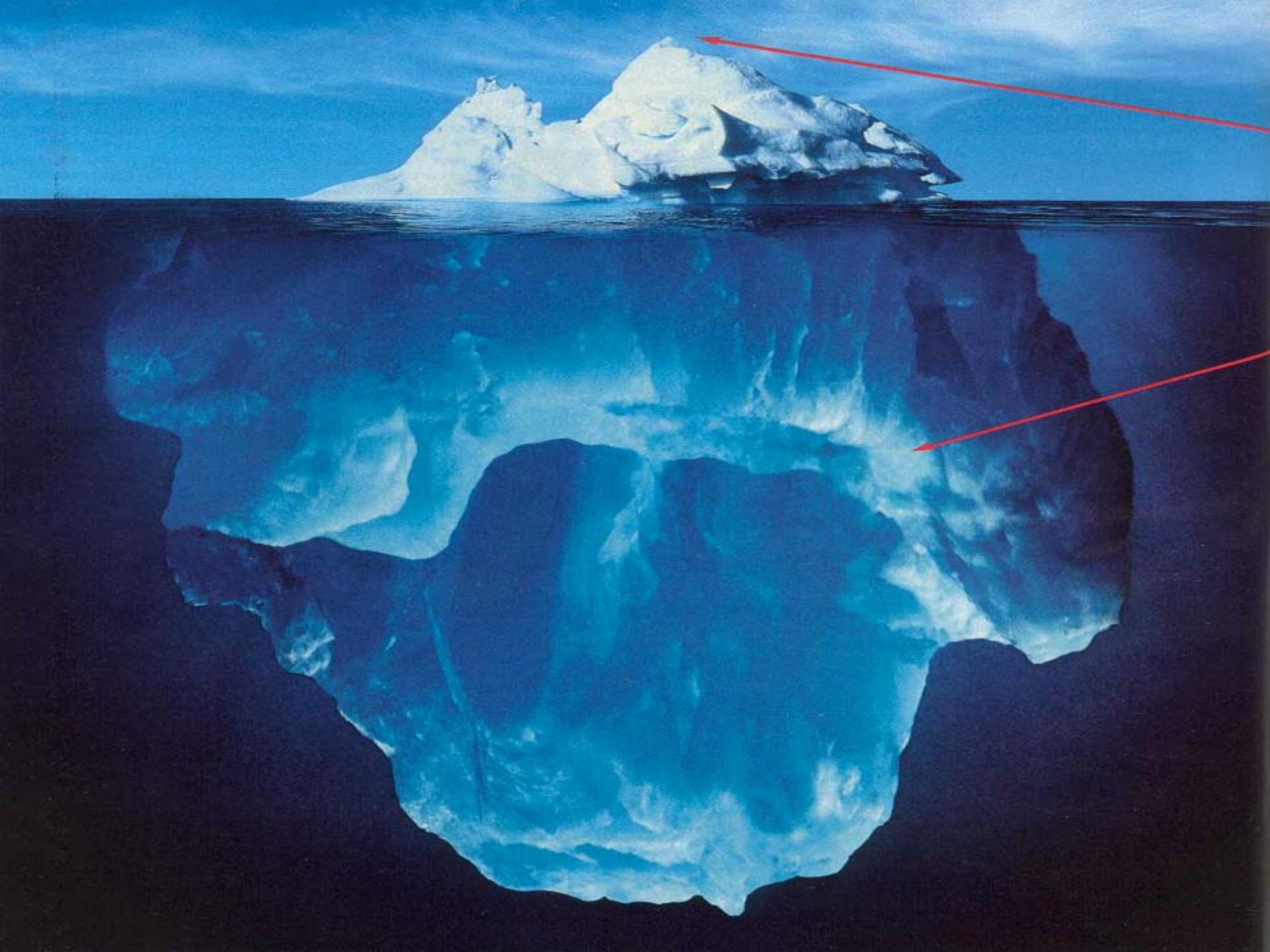
Cultural Issues – The Researchers

Researchers need to understand:

- There is a commercial need to focus on the market
- The market drives R&D
- The significant effort needed for funds to be raised for R&D
- Timelines for milestones must be respected; speed to market issues.

Common Issues

- Unbounded enthusiasm
- Ignorance concerning financing and investors
- Underestimation of most everything
- Hearing impairment regarding market messages
- Focus and attitude
- Less money is far better than too much



Flintbox

<http://www.flintbox.com/>

- Flintbox is a global intellectual property exchange providing easy and open access to innovation. By combining direct access to innovation with a network of members and users from over one hundred countries around the world, Flintbox provides a platform for research and industry to connect and build relationships.

