

# Legal & Regulatory Framework for Technology Management at the National & Institutional Levels

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- **Singapore's framework**
  - **Promoting Linkages between Public Research Institutes & Industry**
- **IP Policies and Regulations**
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# Singapore Overview

## Physical :

- Land area (2008): 710 sq km
- Natural harbor

## Population :

- June 2009: 4.99 million (including 1.25 million expatriates)
- 1960: 1.60 million

## Ethnic Groups :

- Chinese 75%
- Malays 14%
- Indians 9%

## Economy (GDP):

- 2008: S\$257 billion
- 1960: S\$2.1 billion

## Foreign reserves :

- 2008: S\$250 billion
- 1963: S\$1.2 billion



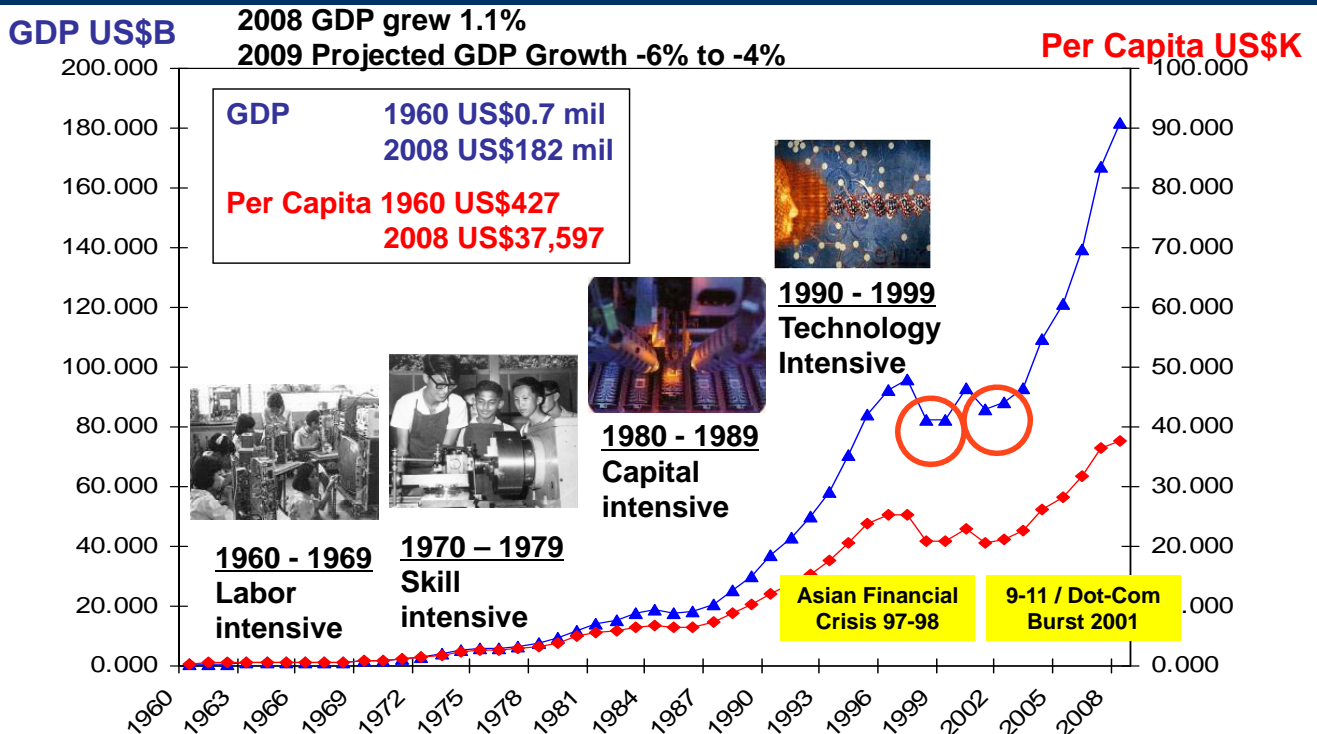
## Political :

- Singapore is a parliamentary democracy
- 1959: Self-government
  - 1963: Merger in Federation of Malaysia
  - 1965: Independence (separation from Malaysia)

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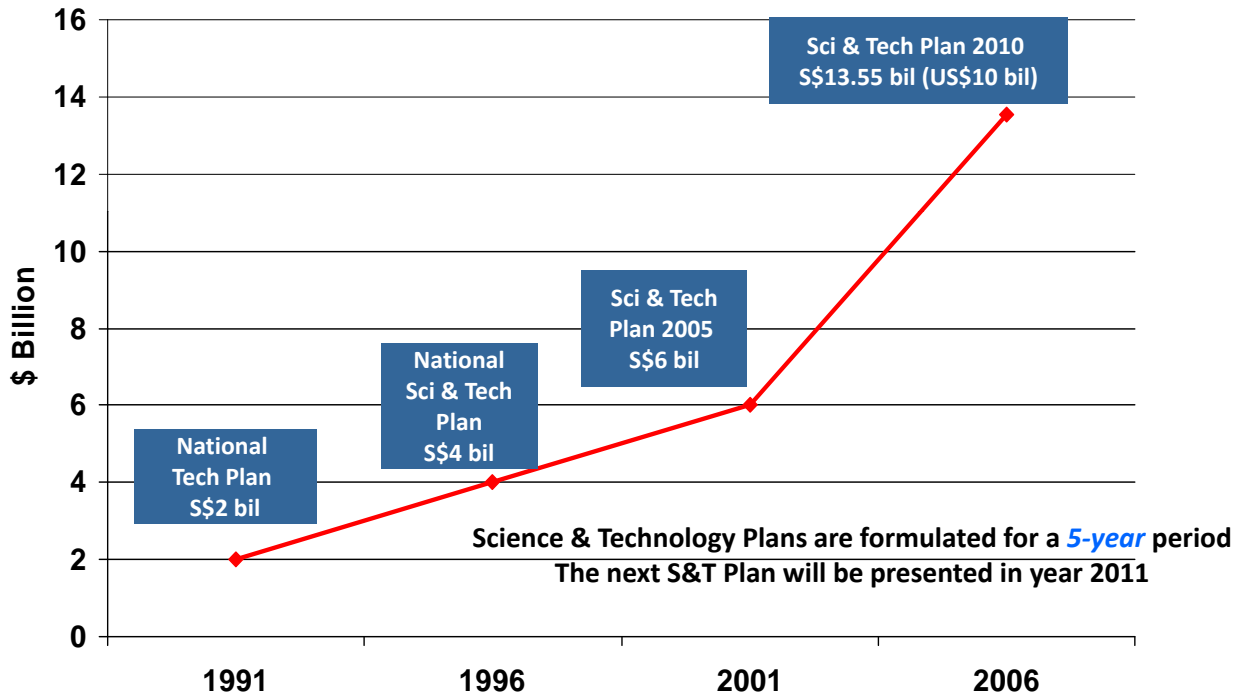
# Evolution of the Singapore Economy



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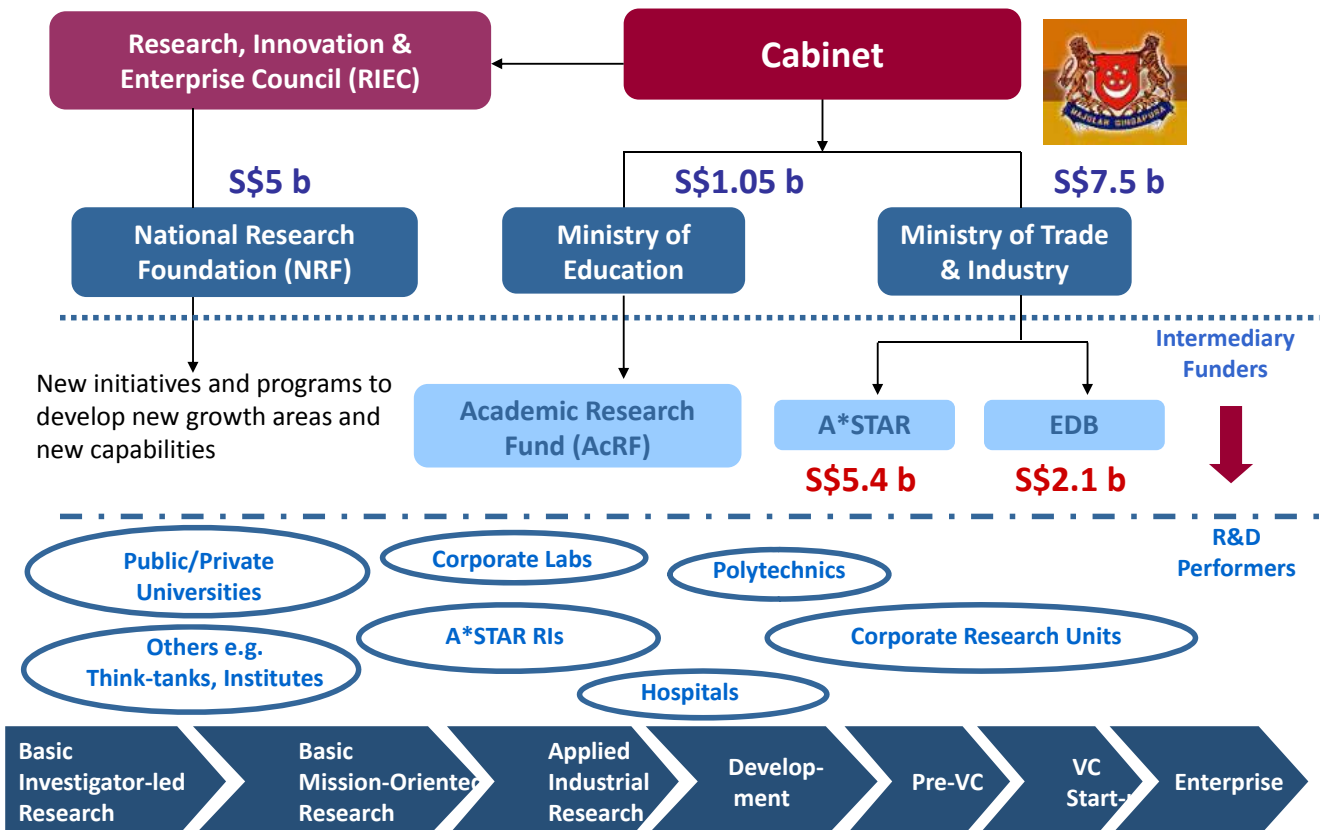
# Increase in government R&D Funding



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# National R&D Framework



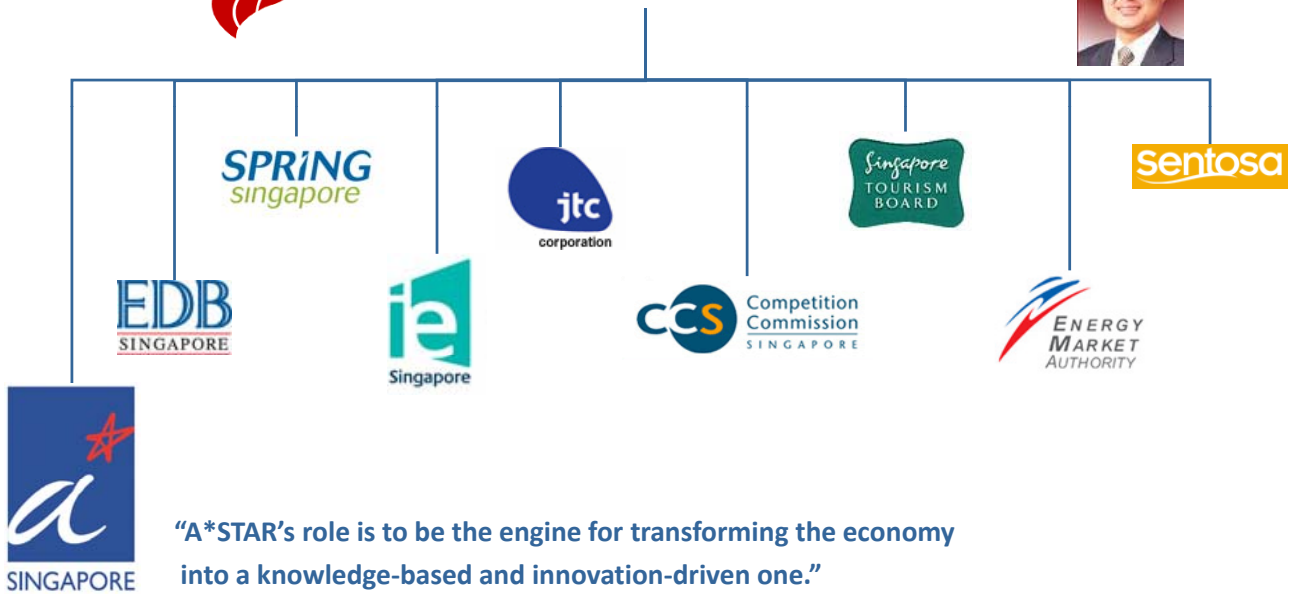
# A\*STAR: an agency under the Ministry of Trade & Industry



Minister:  
Lim Hiang Kiang



## Ministry of Trade and Industry



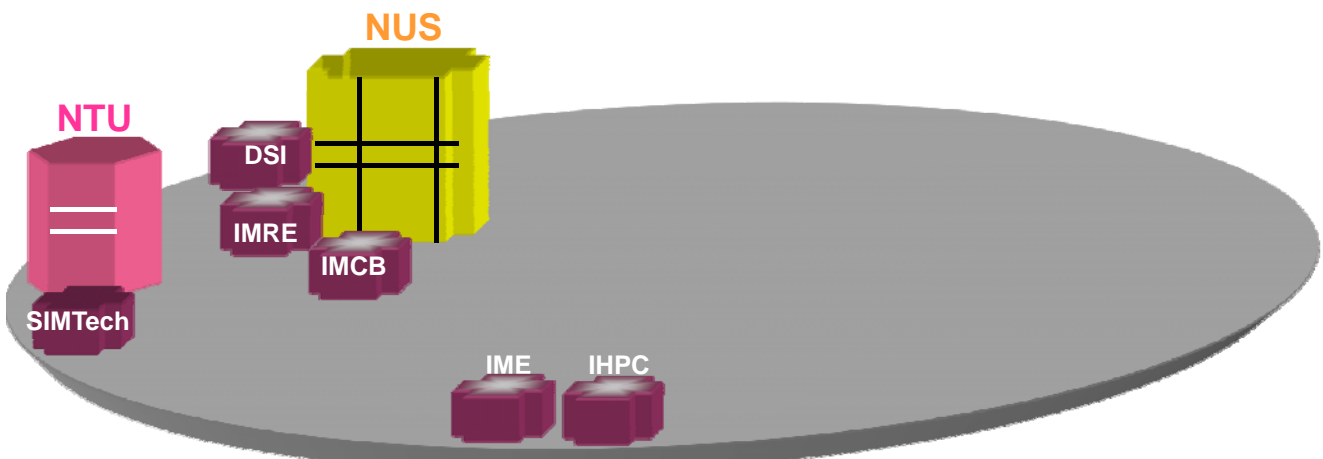
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# Singapore R&D Landscape

## In the 1990s

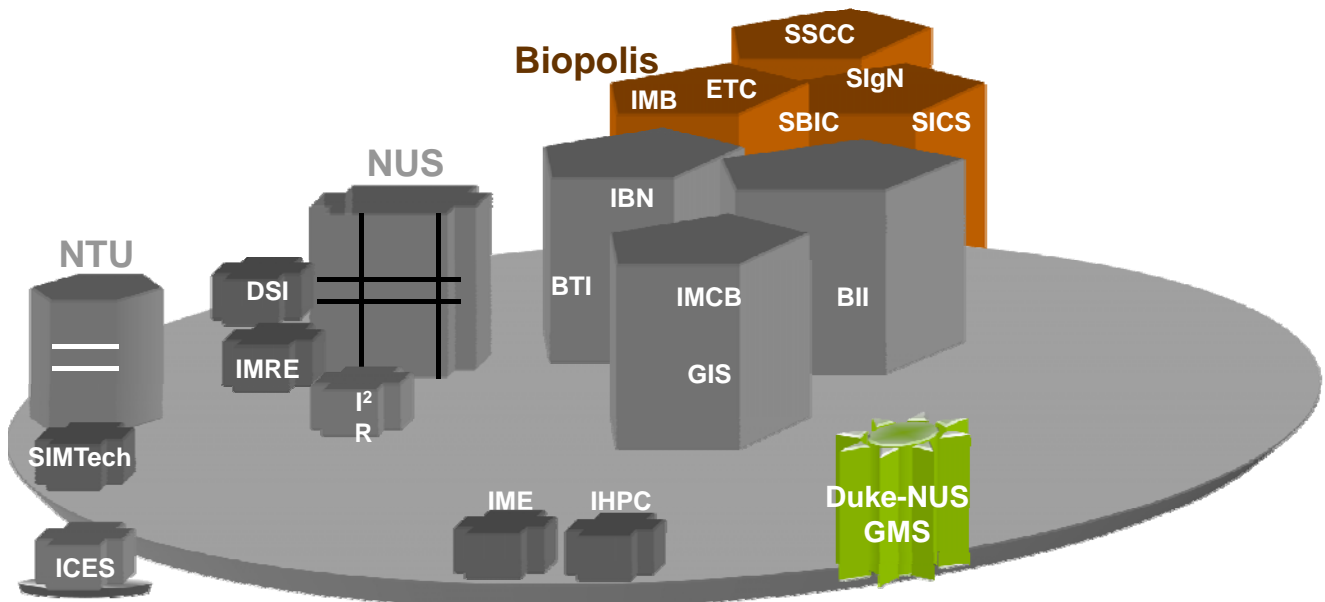
- Pockets of expertise in universities and research institutes



# Singapore R&D Landscape

From 2006 - 2009

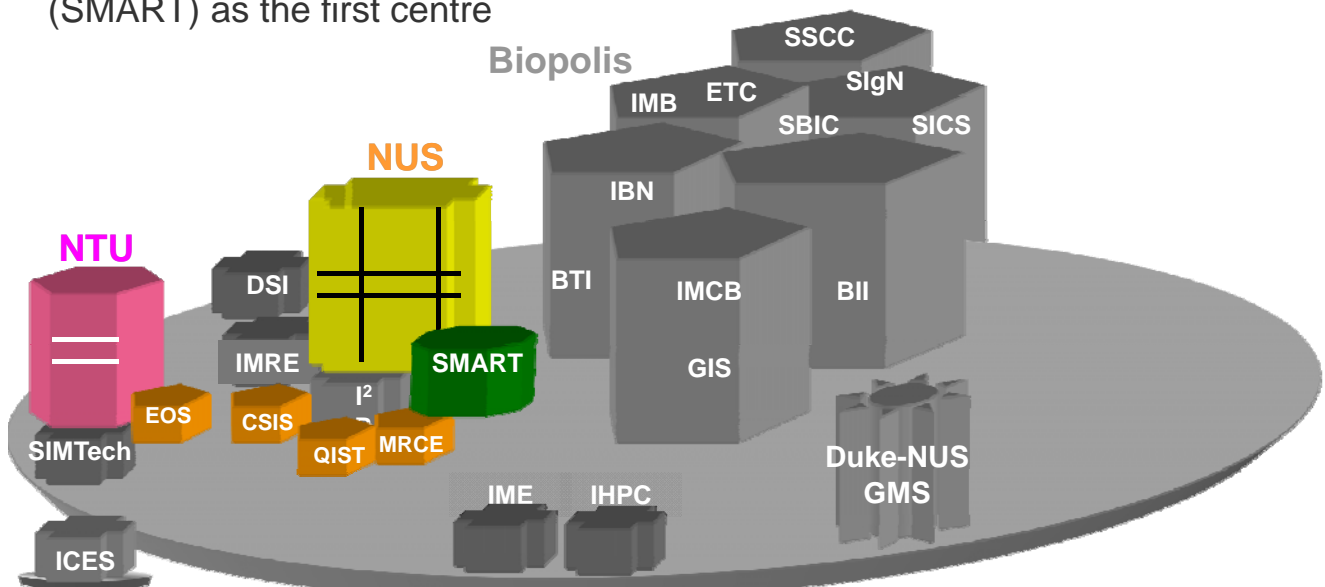
- BMS enters Phase 2 – translational and clinical research
- Setting up of DUKE-NUS Graduate Medical School



# Singapore R&D Landscape (2000 – 2009)

From 2006 - 2009

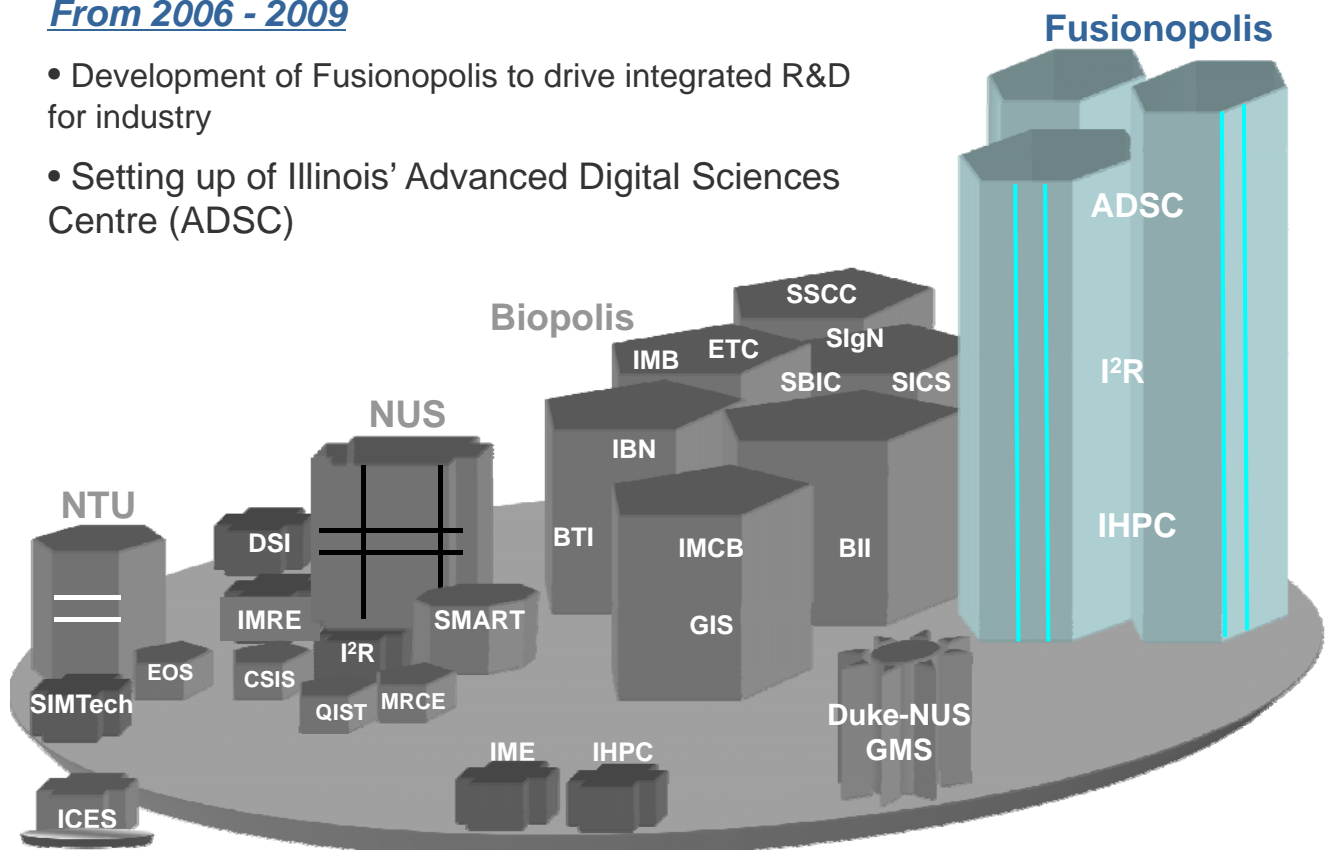
- NUS and NTU transformed into research intensive universities
- Setting up of 4 RCEs @NUS and NTU
  - Quantum Technologies ■ Cancer Science ■ Earth Observatory ■ Mechanobiology ■
- Setting up of CREATE - S'pore-MIT Alliance for Research & Technology (SMART) as the first centre



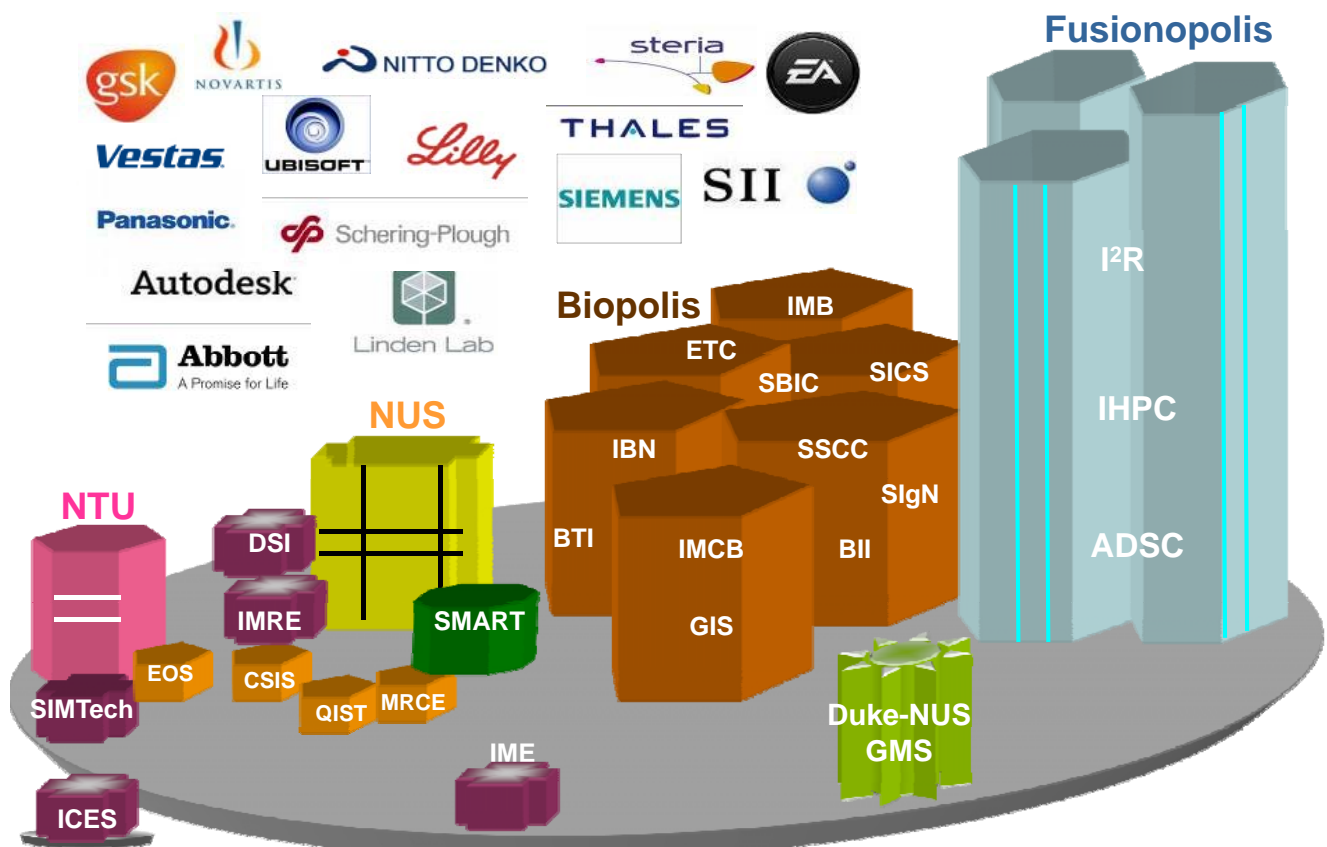
# Singapore R&D Landscape (2000 – 2009)

## From 2006 - 2009

- Development of Fusionopolis to drive integrated R&D for industry
- Setting up of Illinois' Advanced Digital Sciences Centre (ADSC)



# Singapore R&D Landscape





# Biopolis

The Biomedical Hub of Asia



- Completed Phase 1 (2003) and Phase 2 (2006)
- Covering gross floor area of 222,000 sqm
- Houses BMRC RIs
- Coexist with private companies like Abbott, GlaxoSmithKline, Novartis
- More than 2000 professionals in biomedical R&D
- Sharing state-of-the-art equipment, facilities and services
- Promoting greater public-private participation

# fusionopolis

Where Science meets Business and the Arts

- Completed Phase 1 (2008)
- Covering gross floor area of 119,000 sqm
- Houses 2 A\*STAR RIs, Namely I2R and IHPC, under the SERC
- Coexist with private companies like Vestas, Thales, Linden, and Nitto Denko
- More than 1000 professionals in science and engineering R&D
- Test bed for technology in everyday applications
- Promoting greater public-private participation





Phase 2A



Phase 2A



Phase 2B

- Adding 54,000 sqm to Fusionopolis
- To include largest clean room in the region and cater to vibration sensitive labs
- Fusionopolis II will house DSI, IME, IMRE, SIMTech
- ICES will remain on Jurong Island near the petrol/chem industry
- Aim to foster interdisciplinary collaborations and test-bed new technologies

## Extensive Industry Engagement

Partnerships

Applications

Enterprise

Setting up Experimental Therapeutics Centre (ETC)



A\*CAR Consortia

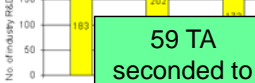
102 researchers attached to 69 SMEs

BTI develops first cytotoxic antibody against undifferentiated stem cells  
BTI collaborating with Raven Biotechnologies to generate novel antibodies to fu



CURIOX

Hundreds Industry R&D projects yearly



59 TA seconded to 40 SMEs

PRECISION ENGINEERING Centre Of Innovation (PE-COI)



AIM Programme

493 RCAs

Breakthroughs in Chikungunya fever research

A\*STAR research produces world's best protection from moisture and oxygen

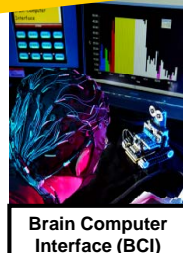
SIMLAB Technologies

SGMD

SERC Aerospace Consortia



46 roadmaps for 46 SMEs



Brain Computer Interface (BCI)

ENCORE





# Extensive Industry Engagement

A\*STAR RIs are involved in 272 and 70 new industry collaborations in FY 2008 and FY 2009 respectively (as of 30 Jun 2009).

A\*STAR has a portfolio of 21 active spin-offs as of 30 Jun 2009.

## Some of A\*STAR's Partners



## New Spin Off Companies



CURIOX

## A\*STAR's Mission

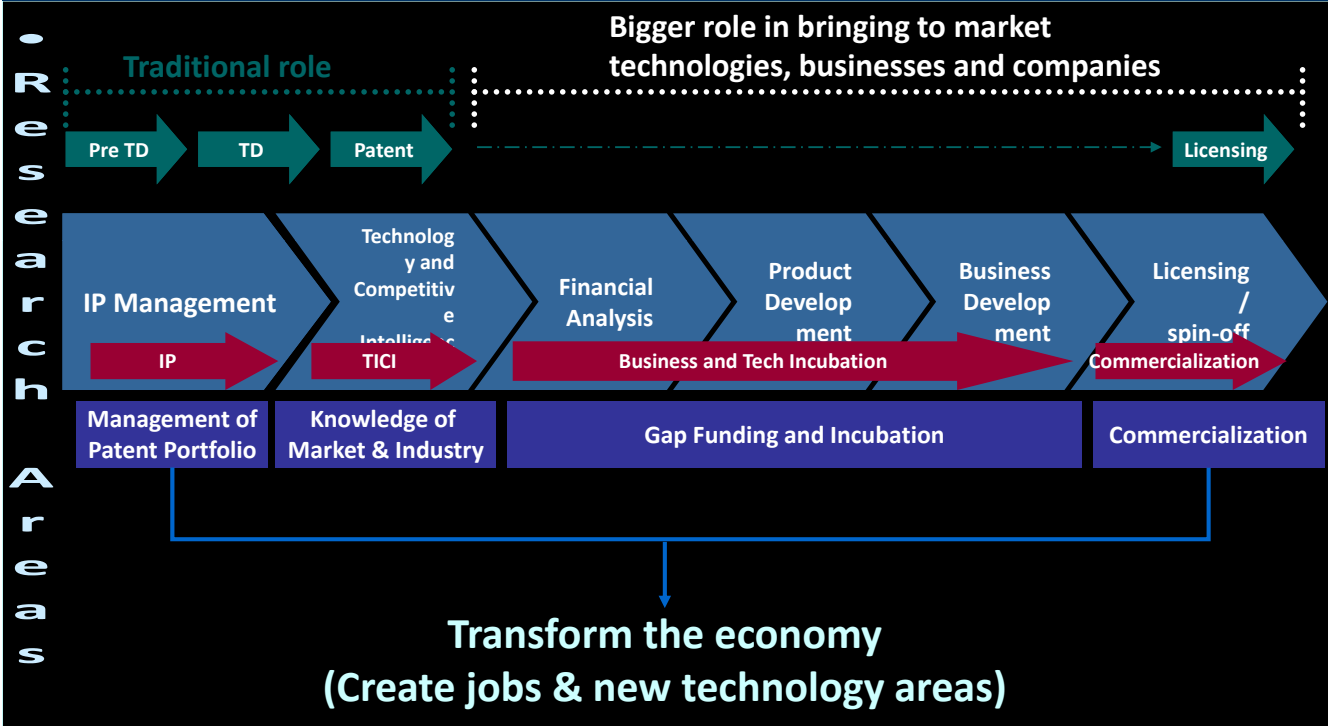


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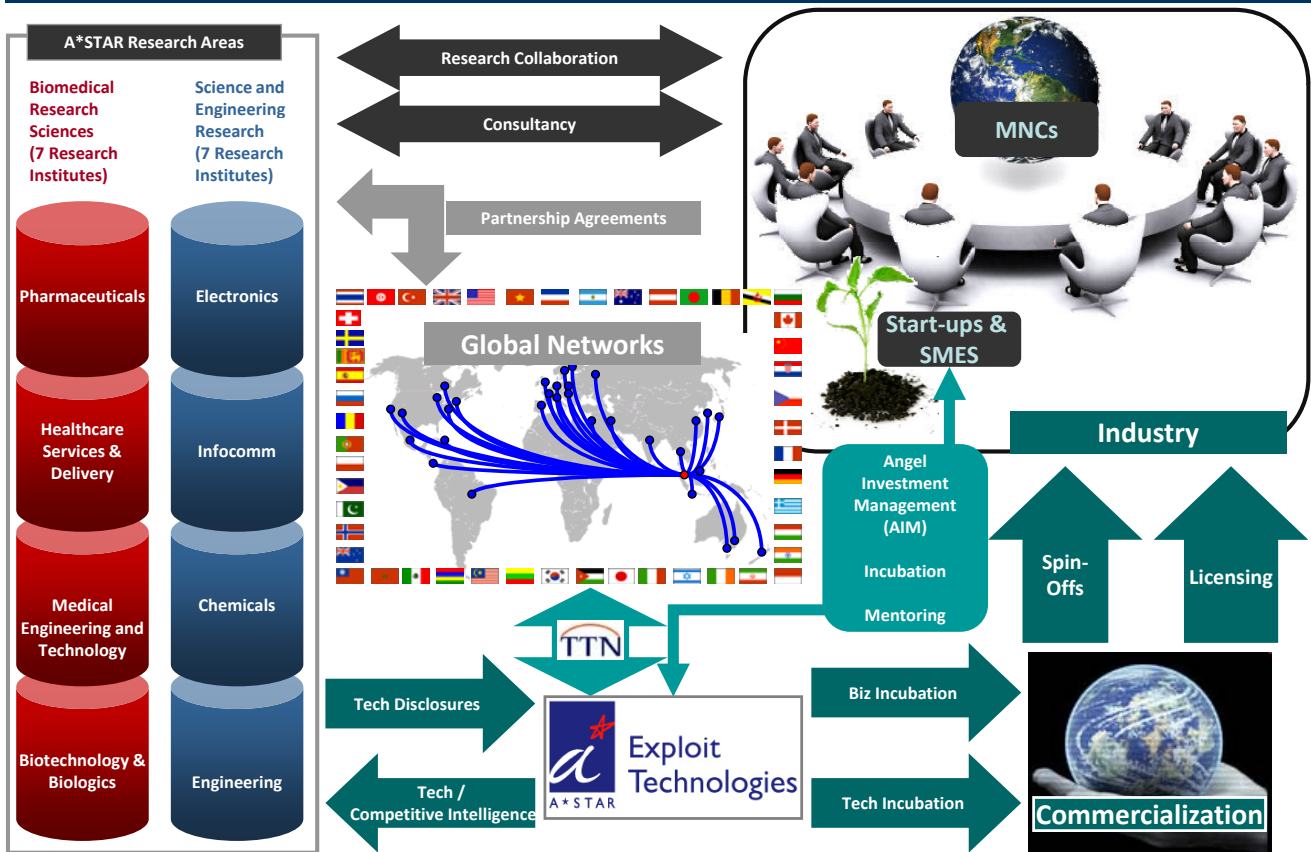
# Exploit Technologies – A\*STAR's TTO



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# A\*STAR / Exploit Tech's Eco-system



# IP & COMMERCIALISATION POLICIES - CONTEXT

- IP policies and practices are not developed in a vacuum
- Need to address and must conform with organization's mission, function and objectives
- Sound IP policies and practices will assist organization to effectively achieve its mission, function and objectives
- Context and hence policies differ from institute to institute

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## National Framework

- Framework of IP protection, management and commercialization for publicly funded research and development
- No force of law – unlike e.g. the Bayh-Dole Act in the US
- Aim
  - To set out the principles and guide and best practices for IP :
    1. Identification
    2. Ownership
    3. Protection
    4. Exploitation

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# Challenges generally faced by Public Agencies

1. IP itself is a relatively new focus
2. Exploiting the IP beyond the traditional provision of public service is also a new focus
3. Lack of familiarity with IP and principles of IP management
4. Lack of local availability of highly skilled technology transfer specialists and IP management professionals

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## Management of Government IP

- FCM M9/2004
  - **Provided guidelines for Government IP Management Framework &**
  - **IP Commercialization revenue generated by Ministries**
- 1. IP Ownership (created in a course of executing a contract)
- 2. Retention of revenue from commercialization of IP
- 3. Generally recognizes that government may not be in the best position to commercially exploit IP

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# IP Ownership

- **Government agencies may choose to own IP in the following situations :**
  - 1. National security or national interest implications;**
  - 2. IP serves to identify the government or associate particular goods or services with the government;**
  - 3. Foreground IP (FIP) created is used to augment existing body of IP that has developed internally or already possesses;**
  - 4. Where government agencies has made significant intellectual contributions to the project development and has demonstrated plans to commercialize the FIP.**

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# Commercialization of IP

- **To encourage officers and government agencies to promote exploitation of IP , MOF allow ministries to retain 50% of the IP revenue generated.**
- **Since ownership of IP resides with the Government, 50% of the IP revenue generated will have to be voted back to the ministry as additional budget following the FY upon the ministry's request.**

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# National Framework of IP Principles for publicly funded R&D

- Objectives
  - Non-binding set of principles
  - To provide frictionless process to accelerate the translation of R&D innovations in the market and to get inventions into the widest possible use.
- Philosophy
  1. Government is not in the best position to spot “winners”
  2. Innovation is a collaborative process
  3. It is sub-optimal to focus on maximizing from licensing
  4. The need to facilitate the process of technology transfer.

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## Key Principles for Publicly-Funded R&D

1. Implement policies that promote exploitation of publicly funded research ideas for the benefit of Singapore and allow the Public Agency to grant licenses to other parties if current licensees are ineffective at commercialization.
2. Provide attractive incentives for inventors in the creation of IP
3. Preference and reasonable efforts made to license publicly funded research results to Singapore based companies; particularly local SMEs

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# Key Principles for Publicly-Funded R&D

4. If the Public Agency elects not to own and/or commercialize the IP within an agreed timeframe to allow the inventor(s) where appropriate, the right to own, license protect and commercialize the IP at his own expense
5. Public Agencies to have clear policy on whether they will claim any ownership and/or rights to the IP generate from R&D they have funded.
6. Public Agencies should reserve royalty free, irrevocable, worldwide, perpetual and non exclusive right to use IP for their own non commercial and R&D purposes.

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## A\*STAR'S IP POLICIES – Summary

### 1. IP Ownership

A\*STAR owns the IP created by employees of A\*STAR RIs in the course of their employment, and undertakes the responsibility of tracking, protecting and licensing the IP.

In collaborative projects, try to avoid joint ownership of IP arising out of the project collaboration, which we term Foreground IP. A\*STAR prefers to own the FIP and license it to the collaborator,

### 2. Non-competition Obligations

A\*STAR does not accept broad non-compete obligations that collaborators may wish to impose on our RIs to prevent them from working with other companies, including the collaborator's competitors. As publicly funded bodies, A\*STAR RIs must be free to work with as many parties as possible to generate economic activity in Singapore.

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# A\*STAR'S IP POLICIES - Summary

## 3. Licensing

A\*STAR aims for a flexible approach to licensing arrangements for successful collaborations with industry. However it has to balance this flexibility with its mission to promote research and the broad dissemination of technology to industry to promote economic activity.

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# A\*STAR'S IP POLICY - OWNERSHIP

- Institutional ownership – not inventor ownership
- All IP centrally owned by A\*STAR
- Exploit Technologies given full rights to commercialize A\*STAR IP in line with A\*STAR's policies
- Generally will not assign IP – but will grant licenses, even exclusive licenses on terms
- Licensing policy geared towards maximizing value – not revenue

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## A\*STAR'S IP POLICY - OWNERSHIP

- IP ownership and licensing models adopted depend on several considerations, including:
  1. Securing A\*STAR RI's freedom to operate and protect against law suits
  2. Ensure that IP developed using public good monies are used to benefit local economy
  3. Maximizing potential use of A\*STAR BIP and FIP
  4. In collaborative project, IP ownership allocated by inventorship, but contributions made by parties considered in determining licensing and access terms

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## A\*STAR'S IP POLICY - OWNERSHIP

- Key consideration in IP agreements is A\*STAR's right to use and exploit IP to achieve broad dissemination for economic benefit
- Ownership is the most effective solution in practice
- Company ownership and license-back to A\*STAR can be used but arrangements must cover a range of possible solutions and can be very complex and costly
- Fragmentation of IP ownership rights is an impediment to effective exploitation

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# Law & Dispute Resolutions



- Generally insist on SG law for contracts
  - ❖ English law an exception
- Avoid submission to foreign jurisdiction
- Preference for arbitration – privacy may override cost considerations
- Watchful of Export Control Compliance

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# Risks & Liabilities

1. Generally very mindful of risks and liabilities
2. Government perceived as having deep pockets but litigation-shy and thus an easy target
3. Dealing with public monies – accountable to Singapore taxpayers
4. No indemnity policy – exceptions on very limited case-by-case basis
5. Will not provide wide-ranging warranties – especially warranties as to non-infringement of 3P IP
6. Disclaimer or limitation of liability for consequential loss and indirect damages
7. Overall cap on liabilities

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# Model for Singapore

- Revenue generation is not the main motivation
  - Economic development for SG
  - Enterprise development
  - Investment promotion
  - Support local companies
- All leading up to more jobs for Singaporeans and wealth for Singapore



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# Model for Singapore

## Works because:-

- Strong and developed IP regime – provides certainty for IP owners
- Availability of stringent enforcement measures
- Efficient court system – speedy disposal of cases
- Specialist IP court
- Growing local presence of IP savvy professionals – patent agents and IP lawyers
- Greater awareness of IP and portfolio building among SMEs and businesses
- Companies and Investors prepared to spend on building patent portfolios and on IP enforcement

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Thank you

*Questions?*

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Thank you!



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