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Technology Transfer Structures



- There is no “one size fits all” approach
- Managing IPR requires institutional, financial and human resources
- Tech transfer offices - fairly recent phenomenon
- Governments are providing more support to PRO patenting and licensing in many countries
- Countries (eg Denmark, Germany, Korea, UK) experimented with regional or sector-based technology transfer offices:
 - **Advantage: economies of scale, portfolio diversification**
 - **Disadvantage: difficulty in developing close working relationships with researchers**

Source: OECD extract

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

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**

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

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

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

Research Collaborations

- Engagement with the industry to achieve commercialization other than direct licensing and spin-offs.
- Value can be realized including
 - **Industry revenue**
 - **Licensing income**
 - **Investments in Singapore**
 - **More R&D in Singapore**
 - **Job creation**
 - **Strengthening of existing business**
- Structured approach to negotiation of contracts with clear escalation process for issues to be resolved

Collaboration Models with Industry

Consortia / Taskforces

- ❖ Consolidate Expertise
- ❖ Application-driven R&D
- ❖ Technology Road mapping
- ❖ T-Up

Facilities

- ❖ Sharing of facilities / equipment to jumpstart operations
- ❖ Lab-in-RI
- ❖ Test-bedding opportunities

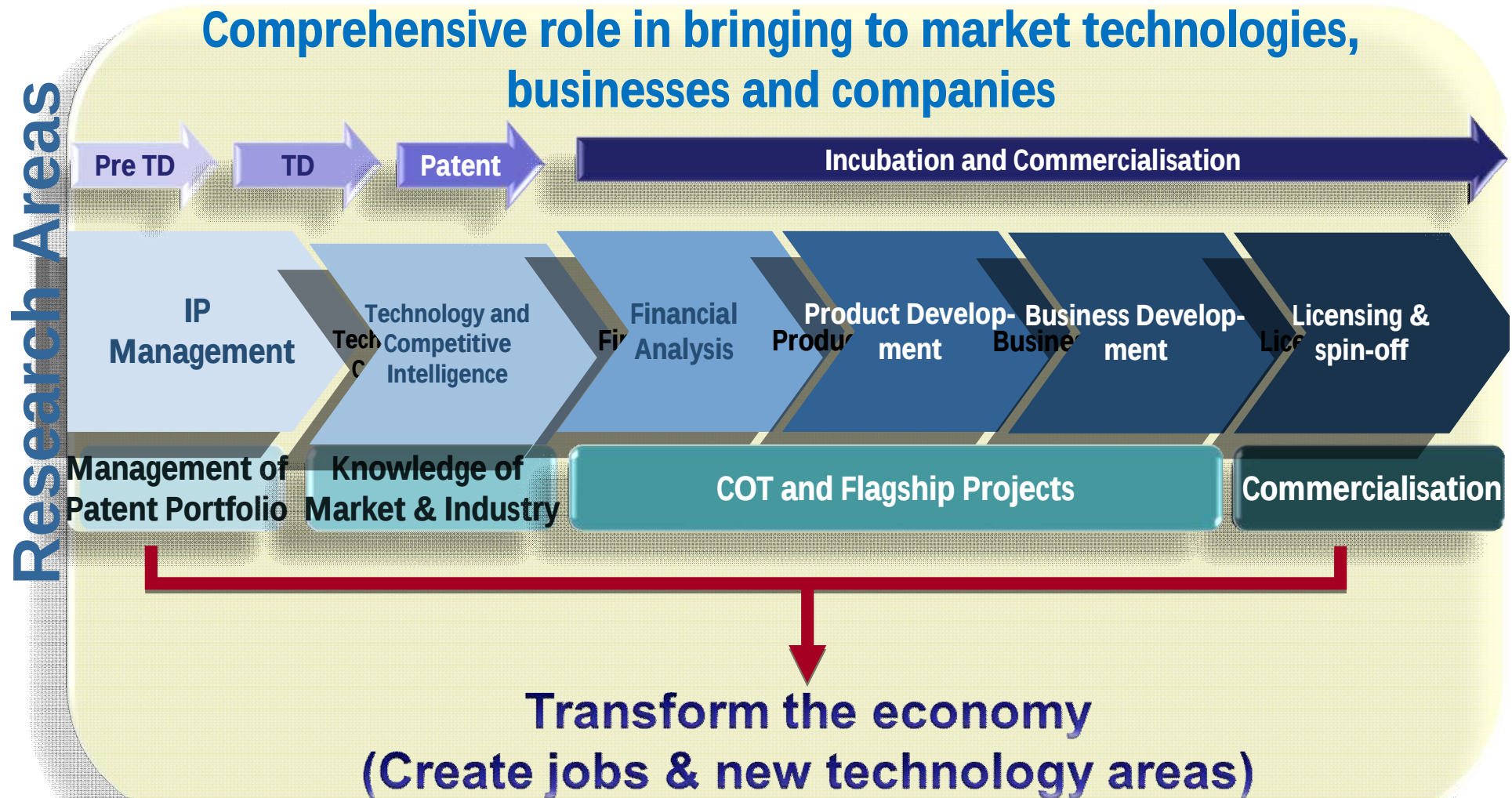
Industry Engagement



Research

- ❖ Joint Research
- ❖ Manpower Development

Exploit Technologies – A*STAR's TTO



A*STAR – Fostering world-class scientific research and talent for a vibrant knowledge-based Singapore

Licensing



Tech Offer



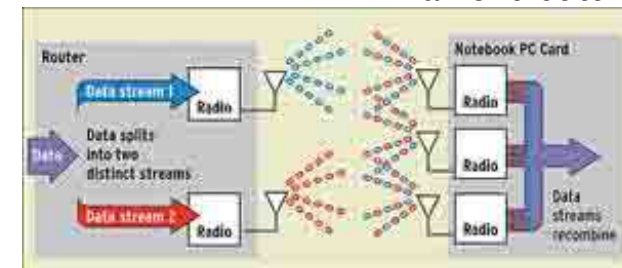
Licensed Technologies



Licensed Plate Recognition



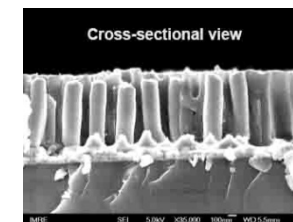
Ultrasonic-Assisted Diamond Cutting



Multi-Input Multi-Output (MIMO)



Face Recognition



Magnetic Fingerprint

Trade Shows /Conferences



IP
Management

TICI

Tech and Biz
Incubation

Commercialization



Why License and not Assign?

- **License**
 - **A*STAR retains ownership**
 - **A*STAR retains a degree of control over the IP**
 - **A*STAR may be restricted from granting subsequent licenses to other Parties**
 - **Licensed IP remains part of A*STAR's asset base**
- **Assignment**
 - **Outright transfer of ownership of IP**
 - **IP becomes part of the assignee's assets**
 - **A*STAR will no longer own or control the IP**

Types Of Licenses

- **Exclusive**
- **Non-exclusive**
- **Sole-license (use clear language)**
- **Sub-license**

5 Stages in Licensing

1. Strategy and preparation
2. Marketing to licensees
3. Valuation and pricing
4. Negotiating the terms
5. Signing and living with the deal

**Licensing revenues
provide incentives for
researchers to explore
commercial applications for
research**

Stage 1: Strategy and Preparation

- **Understand the 'buyer'**
 - **How license fits into licensee's business strategy**
 - **Understanding how licensee views the licensing transaction lays groundwork for licensing success**
- **In developing licensing strategies, important to realize:**
 - **Licensing is a long-term relationship, not a one-off deal**
 - **Success depends on whether the licensor understands the licensee's objectives, concerns and problems**

Stage 2: Marketing to Licensees

- **Disclosure of information during marketing must be carefully handled - many types of intellectual property, especially patents and designs, are very sensitive to disclosure**
- **Minimize disclosure of confidential information and take necessary measures – NDAs/MTAs/Option Agreements**
- **If unsure about what is confidential or how to protect your valuable trade secrets, consult your lawyer**

Stage 3: Valuation & Pricing the Deal

- **What is the value of the licensed intellectual property to the licensee?**
 - **This, rather than the licensor's cost, should be the starting point of a valuation exercise for licensing**
- **Important factors for valuation include:**
 - **Type of intellectual property**
 - **Level of perceived risk**
 - **Intellectual property strength, and**
 - **total costs of bringing the intellectual property to market**

Stage 4: Negotiating the Terms

Before negotiating the terms, a licensor should consider these business points:

- **Understand licensee's interests - investment risk, potential liabilities etc**
- **Know options as to exclusivity- an exclusive licence, sole licence and non-exclusive license all mean different things**
- **Be realistic in royalty expectations - in a competitive marketplace, an overly high royalty rate may spell the difference between profit and loss for a licensee**

Stage 5: Signing & Living With the Deal

- On the one hand, license agreement is definitive rule-book that sets forth terms of your licensing relationship
- On the other hand, signing agreement is not conclusion of a business deal, but beginning of a business relationship
- As in all things, however, balance is necessary - not to sacrifice long-term value of your intellectual asset in the name of 'relationship'

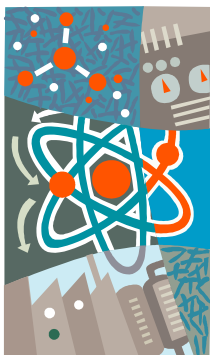
Licensing Snapshot of PROs

- **Two-thirds of PROs negotiate less than 10 licenses per year**
- **Many licenses are for copyright and other non-patented IP**
- **PROs tend to license early-stage technologies requiring further development by companies**

Licensing Snapshot of PROs

- Licensing revenues varies greatly across PROs and countries
- Licensing revenues are highly skewed, with a few licenses generating most of revenue
 - Large percentage of licenses never generate any income
 - Only small percentage earn high income

COT – Helpline for local SMEs



Exploit Technologies
invests upfront and
takes development
risks



SME has **option to
license** when
technology is proven
but **no obligations if
the project fails**

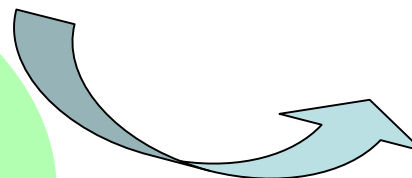
Project managed by
Exploit Technologies
with **requirements
from potential
licensee(s)**

Examples of COT leading to formation of start-ups:

- Curiox (Bioassaying)
- Aksaas (Text analytics)

Examples of COT leading to licences with local start-ups / SMEs:

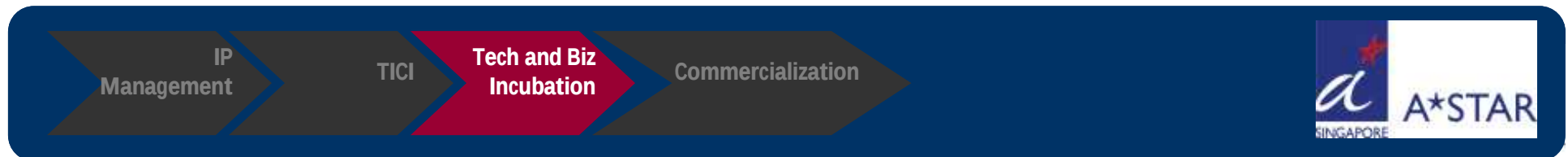
- Veredus (Avian flu kit)
- Commontown (Language learning – repeat customer)
- Aksaas (Document security SDK – repeat customer)
- Haruna (TiO₂)
- Eucharist-Tech, Cybersite (B2Bi Gateway)
- Fosta (Fibre optic sensor)



Companies that
license technologies
need to **invest less
upfront** and pay
royalties only as they
generate revenue

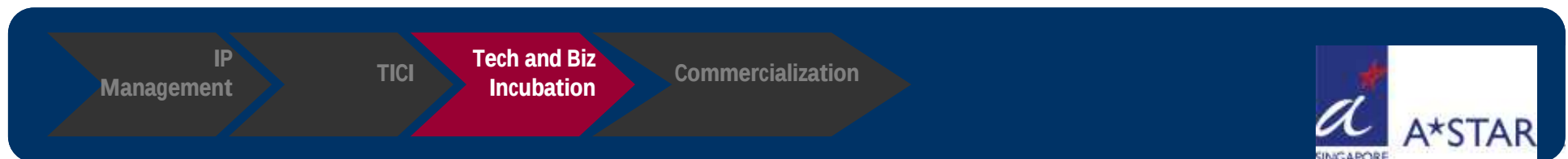
Flagship Program

- Identify novel technologies earlier in the research value chain for larger and more impactful outcome through:
 - building strong patent portfolio
 - infusing commercial focus earlier in R&D
 - inter-RIs and cross-council collaborations
- Typically up to S\$5m
- Dedicated program/project managers
- Early interactions with industry: roundtables, industry forums

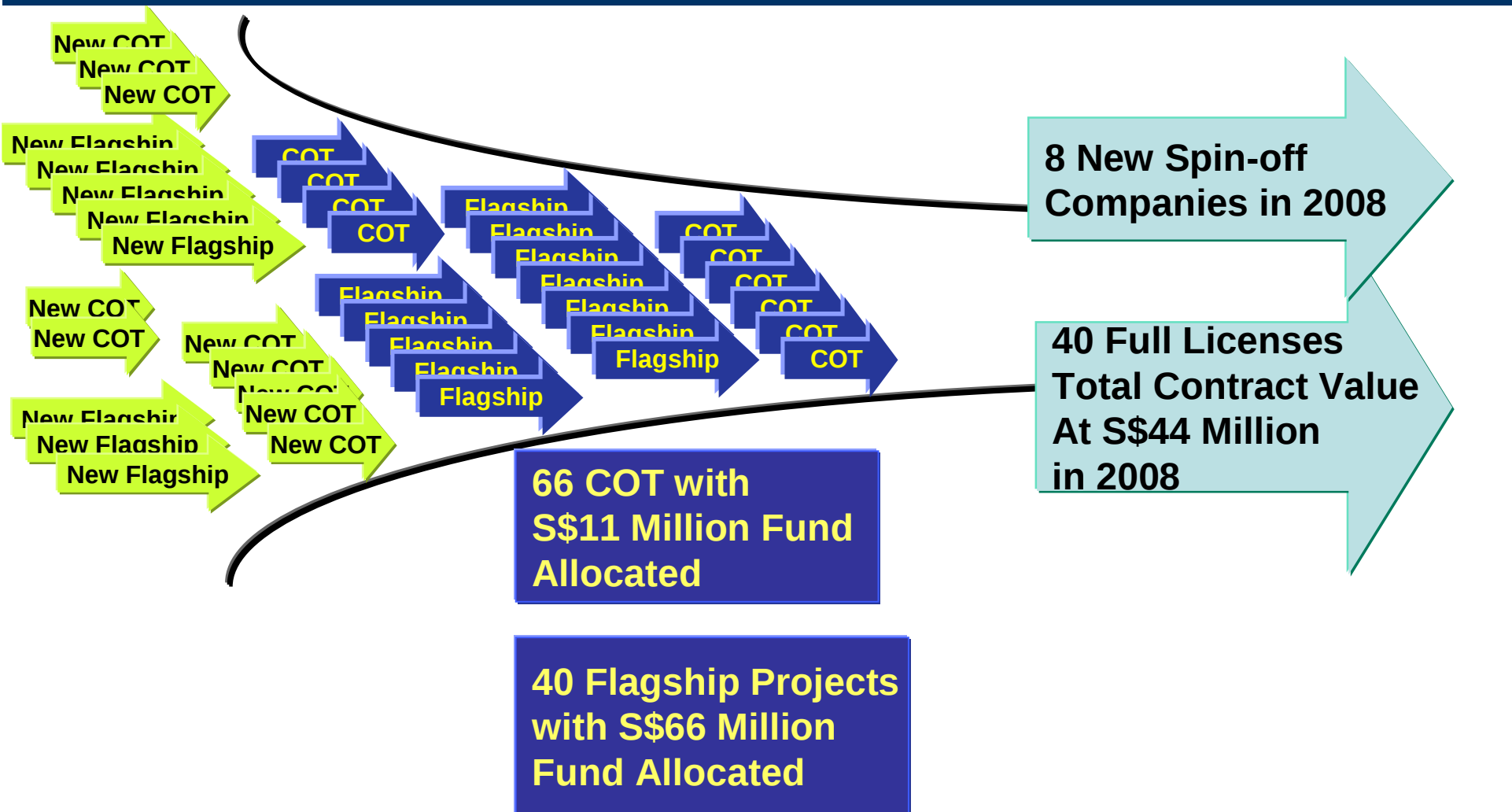


Flagship Program

- Emerging technologies funded and developed to near commercial readiness; significant reduction in technical risks through beta trials and validations
- **Desired Outcome:**
 - **More & stronger licenses**
 - **Spawn new and sustainable local technology-based industries and promote technology start-ups**



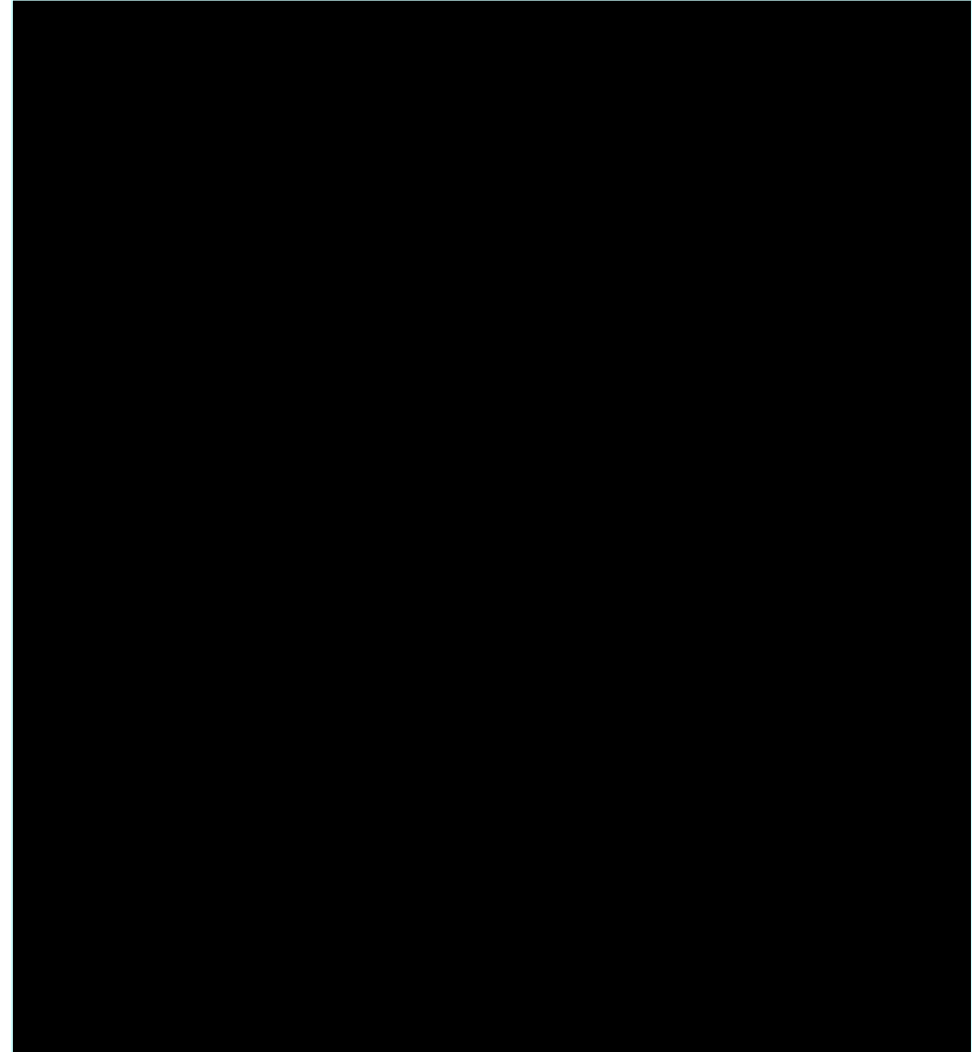
COT and Flagship Pipeline



Investment and Spin-off Management



- Grooms researchers into successful technopreneurs
- Takes a proactive role in strategic planning to building business network
- Provides business support such as marketing, business development and networking
- Guides and develops start-ups to attract venture capitalists and angel investors



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Challenges faced by Spin-offs

1. **Strength of IP**
2. **Avenues to generate more IP**
3. **Avenues to raise more funds**
4. **Conflict of interest**
5. **Management team**
6. **Consultancy**
7. **Exit strategy**

Conclusions

- In most OECD countries, some sort of legal action has been necessary to stimulate the “transfer” of publicly funded research
- Legal instruments are not sufficient, in many countries a change in the culture and mindset of researchers is also needed
- TTOs need to be free to hire high-quality technology transfer specialists with industry experience

Conclusions

- There is no one TTO model - individual countries and organizations are still learning about costs and benefits of various approaches and some are experimenting with regional TTOs
- Close relationships with inventors and labs are necessary to tech transfer process
- Few TTOs are likely to generate positive net revenues, at least in their early years
- The licensing strategies of PROs should ensure continued access to IP so that it is not lost should, for example, a “spin-off” company fail

Thank you

Questions?

A*STAR – Fostering world-class scientific research and talent for a vibrant knowledge-based Singapore

