Granada Health Technology Park: Translating Discovery into Innovation

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Health
PTS Granada

Source: Adapted from http://techcitynews.com/2016/04/26/how-mit-is-supporting-innovation-in-britain/
Granada

4% national scientific production

2.5% country

1.9% population

1.4% GDP
Shortage of Translational and Clinical Research

25,290 articles (in 4 yrs)

101 articles with possible human clinical applications

10 yrs later

5 were in licensed clinical use

1, and only 1, had a major impact on current medical practice

“I think you should be more explicit here in step two.”
Developing medicines is a long, risky and expensive endeavour
The bottlenecks: focus on pre-competitive research
Lost in Translation
Translational Paradigm

Bench to Bedside

Basic
- Disease Focused Investigation
- Pathogenesis and Pathophysiology
- Targets

Basic
- Use of Pre-Clinical Model and Tool Compounds
- Credential Targets

Translation
- Identify and Validate Biomarkers
- Generate Hypothesis
- Diagnosis Treatment Prevention

Clinical
- Does Agent/Test Validate the Target
- Biological Endpoints

Bedside to Bench
What does industry want from Academia?

“Our main need is to identify and validate relevant biomarkers to help us to sensibly decide if we should embark on big Phase III clinical trials, which cost millions of euros to run”

William J. Slichenmyer, MD, VP Therapeutic Development, Pfizer
Steve Averbuch, MD, Executive Director, Merck
Gregory Burke, MD, PhD, Senior VP, Novartis
Renzo Canetta, MD, VP, Global Development, Bristol Myers
Gwen Fyfe, MD, MPH, VP Hematology and Clinical Oncology, Genentech
Gerald Kenneaey MD Product Global Director Astra Zeneca
Homer Pearce, PhD, Global Director Lilly
Industry-Academia Comparison: Translational Capabilities

Academia

- Basic Research
- Preclinical Research
- Patient Care

Industry

- Basic Research
- Pharmaceutical Development
- MKT & sales
How to build New Pathways from Lab to Market:

1. acquire, process, store, and retrieve human specimens
2. develop and conduct biologic surrogate endpoint analyses
3. develop and conduct novel imaging endpoints
4. write and manage INDs
5. write and manage complex translational clinical protocols
6. acquire, manage, and interpret complex clinical and biologic data
Thank you!

Any question?
<table>
<thead>
<tr>
<th>Barrier category</th>
<th>Specific barrier identified by the literature</th>
<th>Solutions</th>
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<tbody>
<tr>
<td><strong>Research workforce</strong></td>
<td>Lack of qualified clinical and translational investigators[^2]</td>
<td>Research education, training, and career development</td>
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<tr>
<td></td>
<td>Lack of sufficient mentoring[^3]</td>
<td>Research education, training, and career development</td>
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<td>Academic reward system and career disincentives[^4]</td>
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<td><strong>Research operations</strong></td>
<td>High research costs and lack of funding[^5]</td>
<td>Pilot and collaborative translational and clinical studies</td>
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<td>Regulatory burden[^6]</td>
<td>Regulatory knowledge and support</td>
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<td>Fragmented infrastructure[^7]</td>
<td>Biomedical informatics; design, biostatistics, and clinical research ethics</td>
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<td>Lack of willing participants in clinical trials[^8], lack of outreach to minorities[^9]</td>
<td>Participant and clinical interactions resources; community engagement</td>
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<td>Incompatible databases between clinical practice and clinical research[^10]</td>
<td>Biomedical informatics</td>
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<td><strong>Organization silos</strong></td>
<td>Lack of communication, coordination, and connection between basic scientist and clinical investigator[^11]</td>
<td>Integrate translational and clinical science by fostering collaboration between departments and schools of an institution and between institutions and industry</td>
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<td>Lack of systematic implementation of interdisciplinary centers by universities[^12]</td>
<td>Create an academic home(center/department/institute) for clinical and translational Science</td>
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<td>Department-based budgeting structure of universities[^13]</td>
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<td>Different departmental policies and procedures[^14]</td>
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Control and proposed solutions
Clinical Research Center:

1. 10 bed research unit dedicated to Ph1 and early PhII trials.
2. Senior nurses trained in conduct of first into human trials.
3. Dedicated research pharmacy with senior pharmacists skilled in clinical research.
4. Online protocol system and order entry.
5. Real time online entry to PK and toxicity data.
6. Associated with the Hospital San Cecilio and the Hospital Universitario Virgen de las Nieves.
Clinical Research Lab:

1. Dedicated to trafficking, sample processing, storage, and retrieval of clinical trials related specimens.
3. Processes blood, urine, body fluids, and normal and neoplastic tissue.
4. Preparation of samples for PK and PD.
5. Separation and storage of normal and tumor cells.
6. Preparation of DNA and RNA.
7. Capacity for short and long-term storage.
1. Research laboratory dedicated to developing, streamlining, and executing GLP level assays measuring surrogate endpoints.
2. Staffed with PhDs with industrial experience.
3. Assays are developed by collaboration with basic research laboratories and industrial partners.
4. Assays are prioritized to support the careers of young clinical investigators.
Model for a Translational and Clinical Research Center → Resource Center

**Resource Center:**

1. Full time, industry equivalent Chief Regulatory Officer who will write and hold PTS-based INDs and work close with pharmaceutical industry in drug development.
2. Identify new drug candidates, ensure the success of trial.
3. Align new drug candidates with Modality-Based Programs and charge each Translational: Clinical Investigator Term.
Model for a Translational and Clinical Research Center → Next Generation

Next Generation:

1. Identify potential translational and clinical investigators.
2. Formalize project teams composed of translational and clinical investigators, focused on a single hypothesis driven project.
3. Provide infrastructure and management for project teams.
4. Provide resources (space, money and human).
5. Partner teams with industrial collaborators.
Clinical and Translational Research Teams

- **Translational Investigator**
  - Lab Project
  - Pre-Clinical
  - Animal and Human models
  - Models
  - Hypothesis
  - Protocol
  - Development

- **Clinical Investigator**
  - Protocol
  - Endpoint
  - Assays
  - Protocol design
  - Activation
  - Data

- **Industry Pre-clinical Clinical**
  - Industrial Partners
  - New agents
  - Pre-clinical models trials
  - Design
  - Endpoint
  - Assays

- **Result**
  - Fist into Human:
  - Proof of concept

Plataforms: 1. Modality program 2. Imaging and Interventional Radiology
Ideal timing

14 months
Proof of Concept
- Small molecules
- Immunotherapy
- Angiogenesis
- Apoptosis
- Metastasis

4 months
Final Protocol
- Scientific Research Committee
- Institutional Research Committee
- Activation

Basic Research
Target
Industrial Collaboration
Candidate Drug
Metrics to determine the success: Institutional Measures

1. Number of first into human and early phase trials led by PTS clinical investigator
2. Number of new validated surrogate biological markers discovered and validated at PTS
3. Number of new stand of care diagnostic tests developed by PTS investigators
4. How many of the above result in changes in the standard of care
5. Institutional Branding as a “Model Disease Center”
6. Positive financial impact
7. Number of collaborations with other Integrative Centers
8. Increase in satisfaction by Department Chairs, Division Chiefs, and Disease Center Leaders
9. Increase in personal satisfaction by clinical and translational investigators
10. Increase in number of trainees and faculty who become clinical and translational investigators
11. Successful recruitment of clinical investigators
12. Retention of clinical investigators
Metrics to determine the success: academic and external

**Academic Measures:**
1. Academic Promotion
2. Manuscripts
3. Grants

**External Measures:**
1. Progression toward clinical impact and change in standard of care
2. Satisfaction by industry