Project Management in Large-Scale Research Projects

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BC Cancer Agency
Genome Sciences Centre
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Genome Sciences Centre

- Started in 1999 by Dr. Michael Smith
- Canada’s largest genome centre, ~5th largest in the world
- ~280 staff, including 9 faculty, 14 staff scientists, and over 60 trainees
- Operates at 2 locations over 50,000 sq. ft. of lab and office space
- Part of British Columbia Cancer Agency, part of Provincial Health Service Authority (PHSA)
Total Funding 1999-Present
$487,461,059 total
256 grants/contracts

- GC/GBC: 40%
- NIH: 29%
- CFI: 14%
- CIHR: 7%
- MSFHR: 3%
- NSERC: 1%
- CCSRI: 3%
- Cdn Other: 3%
- US Other: <1%
- USDOD: <1%

GSC Grant Application Success Rate (1999-present): 45%
Funding sources
Grants, contracts, collaborations
Rationale for Project Management

• Sound project management adds value and increases successful project outcomes.
  • Focusing appropriate expertise on the management or “business” of the project and allows the scientists to focus on the science.
  • Fostering culture of project management within the research team leads to scope and budget control throughout the project.
Role of the Project Manager

- Manage project communications
  - Granting agencies
  - Collaborators/clients
- Monitor and manage project progress
  - “Milestone” or objective management
  - Contingency planning
- Maintain control - budget and scope
- Facilitate grant applications and submissions
Best project management software

• Team of project managers!
Manage Communications

- Internal: PI and project team, department/institution
- External: Funders, Regulators, Public
- Communication tools
  - Email, meeting
  - Reports - progress, status, forecast
Monitor Progress

- Reports
  - Gantt charts
  - Financial status
  - Reports - progress, status, forecast
- Meetings
- Project “wiki”
Maintain Control

- Control does not mean “limit” or “restrict” - it means “check and correct” as required
  - Within funder rules and guidelines
- Emphasis on scope management
  - Stamp out Scope Creep!
- Challenge: science is all about change
SCOPE CHANGE
Disruptive “next generation” sequencing technology

> 2,800 – fold decrease in cost / base
> 4,600-fold increase in throughput / instrument-year

Old Generation (pre-2006) = 92 machine-years

Next Generation (2006-2010) = 1 machine-week
Evolution of the Next-generation Sequencing Platform at the GSC - 2007-2010

September 2007 to September 2010

3 Illumina GAs
2 cluster stations
PET in development
Standard read length 35bp
Flow cell raw data yield 3.5Gbps or 10.5Gbps/week

GA-II released
2008

2 cluster stations
PET standard on all instruments
Read lengths up to 100bp
Flow cell raw data yield 50Gbps or 700 Gbps/week

SOLiD version 2.0 evaluation
2009

16 Illumina GAiix’s
8 cluster stations
PET standard on all instruments
Read lengths up to 100bp
Flow cell raw data yield 50Gbps or 700 Gbps/week

10 SOLiD version 4.0 sequencers - >460Gbps/week
The Illumina HiSeq 2000
# Evolution of disruption

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<th>per sample</th>
<th>pre-2001</th>
<th>2004</th>
<th>2007</th>
<th>2008</th>
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<th>2010</th>
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<tr>
<td>Cost ($)</td>
<td>&gt;$3 billion</td>
<td>$60 million</td>
<td>$400,000</td>
<td>$160,000</td>
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<td>$12,500</td>
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<tr>
<td>TAT (weeks)</td>
<td>&gt;25,000</td>
<td>572</td>
<td>28</td>
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Facilitate grant applications

• Identify funding opportunities
• Review research ideas
• Grant writing and submission
• Connect with others
  • Statistical analysis
  • Protocol design
  • Bioinformatics
  • REB and other certification
Role of the Project Manager

- Listen, remind, encourage
- Email, spreadsheets (repeat as needed)
- Challenging
  - Keeping science organized
  - Keeping up with changing technology
  - Meeting funder requirements
  - Allow scope change while preventing scope creep
- Contribution - enabling research
Rationale for Project Management in Research

• Project and business management expertise improves research outcomes
  • Scientific resources focus scientific activities → greater scientific success
  • Management professionals → provision of higher quality service
  • Integration of PMt principles throughout project teams → efficient successful projects