Practical Aspects of Running a Bioinformatics Core Facility

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Structure

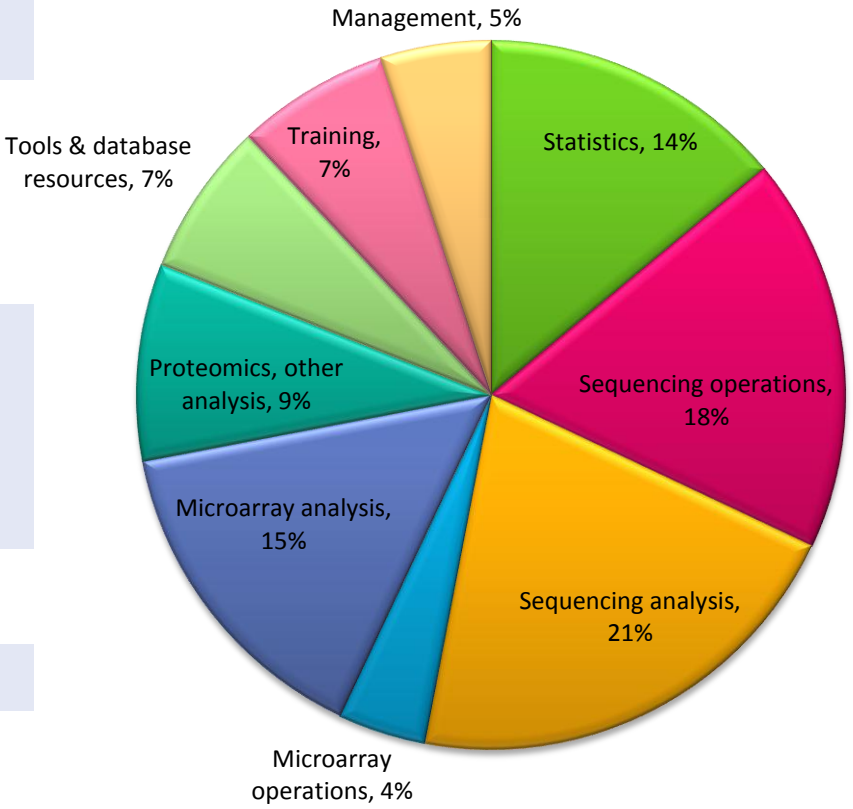
- Team structure/composition (9.4 FTE)

- Customers
  - 300 research scientists in 22 research groups
  - Other core facilities – Genomics, Proteomics
  - Sequencing operation for 3 collaborating institutes in Cambridge

- CompBio @ CRI
  - Core (10) + 2 research groups (20) + 10 “embedded” in wet-lab groups

Services

Statistics	Drop-in clinics
Experimental Design	Experimental design clinics
Next gen sequencing	LIMS Data management, processing, QC Analysis pipeline development Analysis projects – ChIP-seq, variation
Microarrays	Operational support, data QC Analysis pipeline, Bioconductor packages ▪ beadarray package, probe annotation Analysis projects ▪ Illumina expression, Affymetrix SNP, exon, ...
Proteomics	Analysis projects – SILAC MS/MS, protein arrays
Other analysis	Motif enrichment
Analysis tools & data resources	Galaxy, Ensembl (local installations) Commercial databases, tools
Training courses	NGS, microarrays, motif analysis, functional/pathway analysis



Funding

- Cross charging since April 2011
  - Hourly rate for consultation and analysis support directly attributable to research group or grant
  - Does not include overheads (seminars, office space, computing resources)
  - No sign-off or approval process

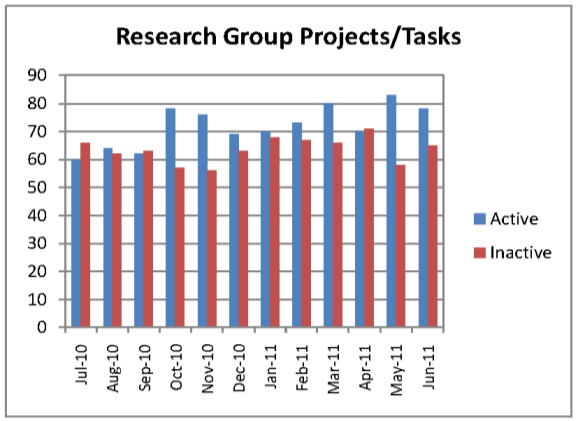
- Exemptions
  - Drop-in clinics, experimental design meetings
  - Training courses
  - Operational support – LIMS, analysis pipeline development
  - Commercial software and database licenses

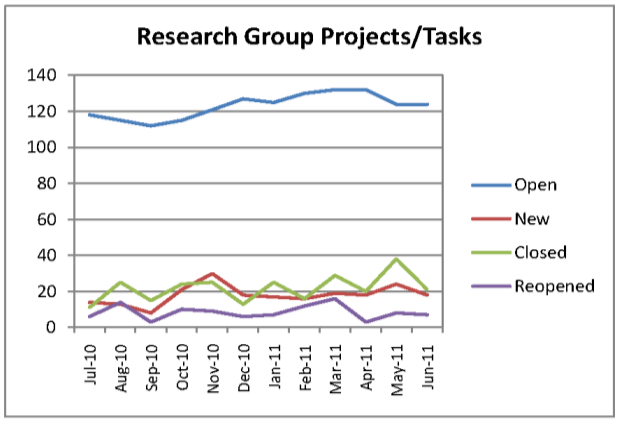
- Approx. 40% recorded time is cross-charged

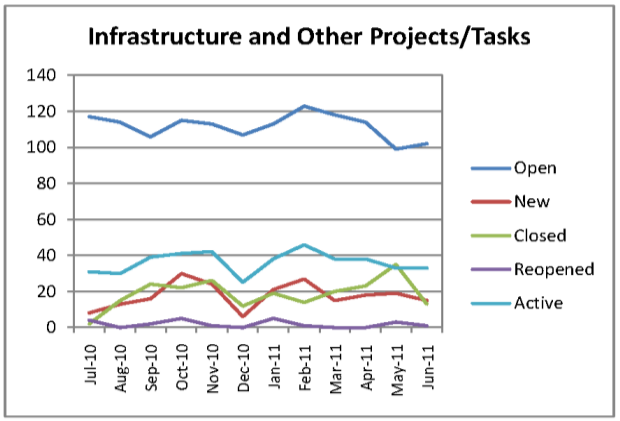
Monitoring

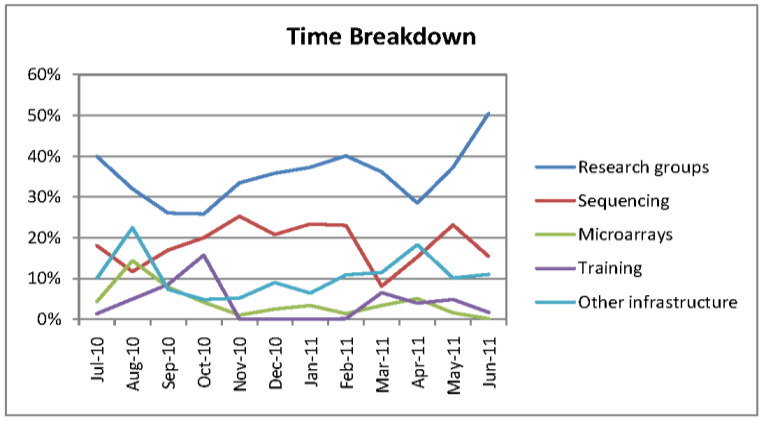
- Group objectives (yearly)
- Update to Steering committee (quarterly)
- Scorecard (monthly)
  - Metrics to monitor health/performance of Core
- External review (every 3 – 4 years)
  - User questionnaire/survey
  - Detailed report
  - Assessment by external review panel

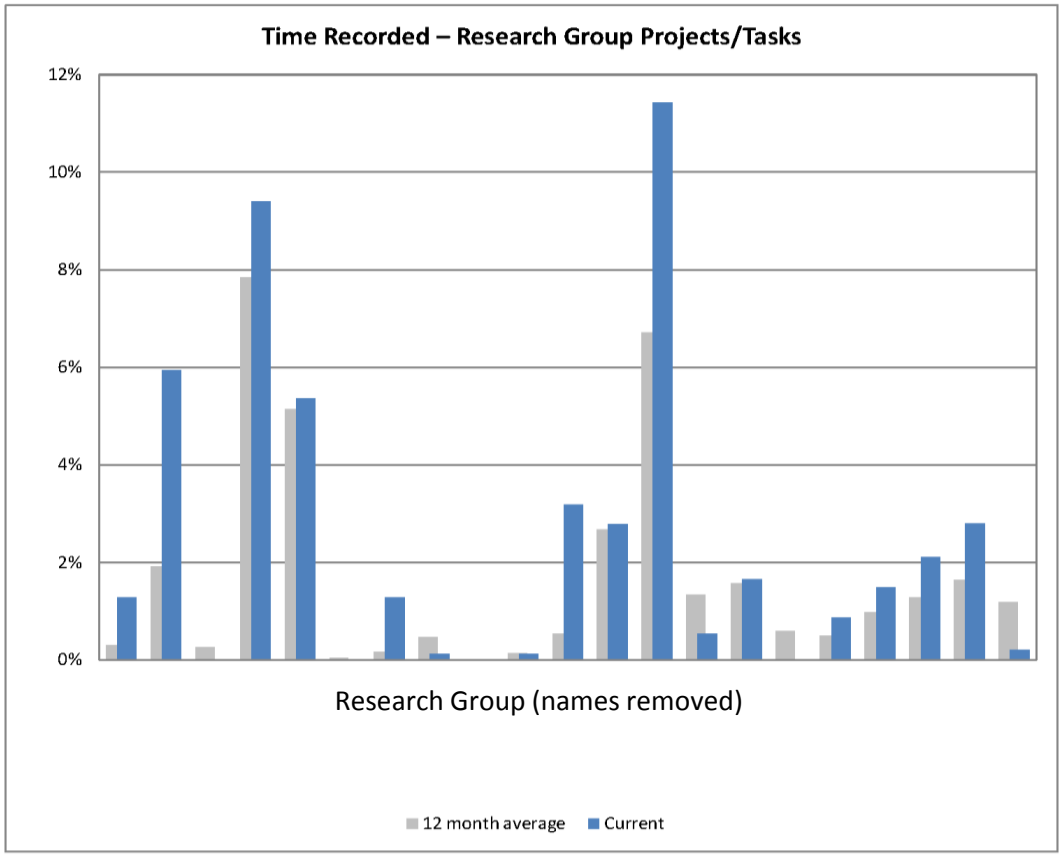
Bioinformatics Core Scorecard – June 2011

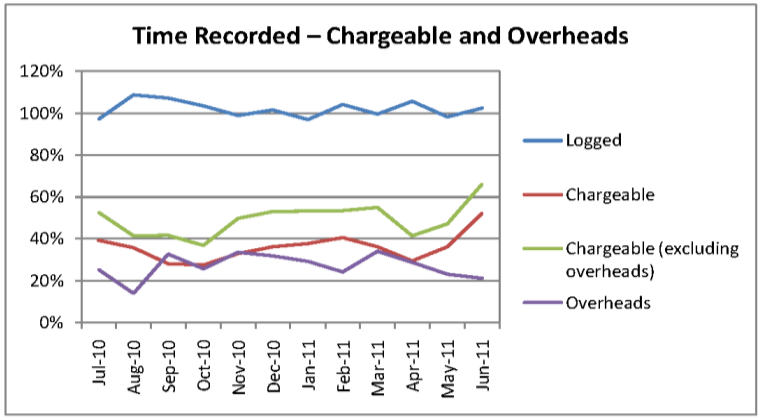












Challenges

Challenge	Strategy/Response
Large numbers of projects and support requests	▪ Project tracking/management
High workload/demand	▪ Analysis pipeline development ▪ Balancing workload across team ▪ Cross charging
Frustration with turnaround/responsiveness	▪ Improved communication, expectation setting ▪ Enabling biologists to be more self-sufficient (training courses, access to tools, databases)
Evolving bioinformatics service model	▪ Changing interactions with users, remit and nature of service

Project tracking

Challenge: volume of projects/requests

- 70 – 80 chargeable projects/tasks active each month
  - largely excludes infrastructure, software development
- Project management tool (redmine)
  - Capture project details, status
  - Time logging for monitoring, charging
- Projects largely scheduled on FIFO basis but no formal queue
- Questions:
  - *Do other cores operate a more formal queuing/scheduling process?*
  - *How are other cores measuring response/turnaround times?*

Workload management

- Communication with researchers
  - Clearly define scope/deliverables, set realistic expectations
  - Communicate often about project status and progress
- Balance workload within team
  - Project monitoring and reassignment
  - Skills development across team
- Analysis pipeline development and automation
  - Significant investment but yields efficiency gains and consistent, high-quality deliverables
- Access to analysis tools/resources and training
  - Galaxy including roll-out of analysis tools developed in-house
  - Various commercial databases and associated tools

Challenge: high workload/demand

Challenge: turnaround, responsiveness

Future of the Bioinformatics Core

Challenge: evolving service model

- Increasing adoption of "embedded bioinformatician" model

- Bioinformatics Editorial, March 2011, Kallioniemi, Wessels & Valencia

  Author's institutes:
  - Core: 1 FTE per 100 scientists, institutionally-funded
  - Embedded: 5–10x working in research groups funded by outside grants

  Changing nature of Core service:
  - More emphasis on more general, institute-wide support activities, less on specific research-oriented work

- Questions*:*
  - *What impact would this have on the Core's ability*
    - *to deliver services, e.g. training, pipeline development?*
    - *to retain high-calibre staff?*