



Marine Microbial Biodiversity, Bioinformatics & Biotechnology



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Selected sites to receive OSD support

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Summary

We formed an OSD Committee to prioritize Micro B3 budget spend for OSD 2014. We prioritized spending on sequencing to get best economy of scale, maximize data generated and based on the success of the OSD Consortium in unifying a range of sites willing to give samples to make OSD 2014 possible. As an OSD Committee, co-ordinated by the OSD Core Team, we explored options for data generation, generated a call and publicized it, obtained quotes and offers for collaborative contributions to OSD, reviewed and selected the best option, and recommended it to the Micro B3 community for final vote. The final decision was to spend fund in 2014 on sequencing of community profiles and metagenomes as agreed at the April 2014 EEB.

BACKGROUND: Spending the Budget for OSD

As described in D2.3 (Initial list of suitable sampling sites) and D2.5 (Final call for sampling sites), we will not conduct a final call for sampling sites associated with an 'open call' for participation since OSD is already up and running. We will channel equivalent efforts into increasing the number of sites involved right up to the June 2014 event. This flexibility in dealing with the sampling sites has turned out to be a major part of the success of the project so far. Instead we will channel the funds set aside for OSD sites into generating data from OSD. A suggestion on how the budget will be split and spent prepared by an OSD committee formed and run as described below.

The Budget for OSD - Original DoW

For some OSD participants from outside the consortium a lump-sum contribution will be given to those partners with interesting sampling sites in need of some support. For this incentive funding for the Ocean Sampling Day around 90,000 Euro are reserved. The money will be dedicated for the logistics and organization of the OSD as well for some support of the best qualified external research teams, based on an open call to be launched within Micro B3. The financial aspects of this call and of the training sub-contracts will be managed by Jacobs Uni.

Amendment to DoW Agreed at EEB in 2013

At the EEB in May 2013 we discussed the OSD Call. We have 90,000 Euro reserved for OSD call, we were going to identify important sites that need support and the rest could go to cover sequencing costs. In reality we completed this task far faster than expected. We have already identified 60+ stations (May 2013) and an informal call for more to join is already out there. We have a list of stations, they keep flowing in. Therefore we do not need a formal call for OSD including support, but want still spend the money on the OSD. There was strong support for spending the money on sequencing. We discussed how best to decide to how to disperse the money and took the decision to form a committee. The EEB



agreed that the procedure we will follow will be to form an expert selection committee from WP leaders to prepare for the next GA what the money will be spent on. It was agreed that WP2 Leader would lead on this.

The OSD Committee

We formed an OSD Committee with the following Terms of Reference and Membership.

TERMS OF REFERENCE

It was agreed that the committee membership will be drawn from the following groups:

1. Micro B3 WP Leaders (All invited, agreed that WP Leaders can nominate representatives)
2. The OSD Core Team
3. Advisory Board members
4. Additional members of the wider committee selected if the OSD Committee required further input

The remit of this group will be to make a call for in kind generation of data for OSD and quotes for services for generating new data and use this information to decide on the budget spend of 90K Euros for 2014. This Committee is a taskforce with a specific task and will exist only until the funds are spent. Primary strategic development of OSD long-term still lies with the OSD Co-ordinators as we build the OSD Consortium.

Committee Members

The committee agrees keep membership small and membership is as follows as of Oct 2013:

1. Micro B3 WP Leaders:

- Frank Oliver Glöckner (WP1, Coordinator)
- Dawn Field (WP2, Chair)
- Dick Schaap (WP3)
- Guy Cochrane (WP4)
- Renzo Kottmann (WP5)
- Chris Bowler (WP6)
- Viggo Marteinson (WP7 Representative for Dick Janssen)
- Tom Dedeurwaerdere (WP8)
- Johanna Wesnigk (WP9)

2. The OSD Core Team

- Mesude Bicak
- Anna Klindworth



Katja Lehmann

3. Advisory Board members

Linda Amaral-Zettler

Scope of the Budget Spend

The OSD Committee moved to prioritize the budget as follows:

The total budget is 90,000 Euros and can only be spent on the June 2014 event (or on further pilot projects - i.e. metagenomes, other primers).

In discussing what is in scope for the money the committee has agreed that our priorities are to support sequencing costs:

Budget items in scope:

1. sequencing
2. consumables for sampling (filters, shipping)

potential priorities: Med countries (Maghreb)

Moroccan sites, Alexandria, North Cyprus

We also considered supporting the cost of metadata that might be associated with OSD samples if there were sufficient funds.

Budget items deemed out of scope:

1. training/workshops (this is supported with other funds)
2. sampling (ship time, costs for staff, equipment), this is supported by in kind contributions by sites

The strong consensus of the OSD Committee is that priority is to cover sequencing costs.

SUGGESTED BREAKDOWN OF BUDGET

10K for logistics support

Shipping, filters, consumables

80K for sequencing

rRNA and metagenomes as well as costs for DNA extraction and primers

We will aim for analysis of 500 samples - seeking in kind support in the first instances. We will circulate a call for the generation of candidate data sets to include the following:



Candidate list of data sets:

Foundational dataset:

- Community profiling of bacteria - 16S

Plus any or all:

- metagenomes (shotgun sequencing)
- 18S
- ITS
- viral sequencing
- use of other bacterial primers
- Fuhrman's primer
- V6 (VAMPs comparison to ICOMM)
- targeted deep sequencing of specific samples

Further wish list:

- cell densities
- environmental parameters
- microarrays

In making all final budget decisions we will be optimizing based on the quality of final scientific outputs of OSD.

THE CALL

As a result of Committee deliberations we posted on the OSD website an open call for contributions in Nov 2014. This was also circulated to a number of potential collaborators by the OSD Core Team.

OSD Open Call for Data Generation Partners

All of the work of the Ocean Sampling Day effort has been based on tremendous in kind contributions of the community co-ordinated by the Micro B3 project. Now, based on the successful engagement of 60+ sites (May 2013), in close collaboration with the Genomic Observatories (GOs) Network, preliminary sequencing results, generated by Argonne National Lab and a growing legal framework, including the option for bioarchiving through the Smithsonian's GGI initiative, we are making an open call for participation in the main OSD event on the summer solstice June 2014.

In addition to expressions of interest from expert sampling sites, we are looking forward to add additional data generation activities, specifically **DNA extraction, PCR and sequencing support**, to OSD.



We expect to have around **500 samples** and are particularly interested in the following types of data, but are open to additional uses of OSD samples:

OSD PRIORITY DATA SETS

Foundational dataset:

Community profiling of bacteria & Archaea - 16S (V3, V4) (already started by ANL)

Plus any or all:

- Metagenomes (shotgun sequencing)
- 18S
- ITS
- Viral sequencing
- Use of other primers for bacterial communities profiling (other regions of 16S, other loci, etc)
- Targeted deep sequencing of specific samples
- Metatranscriptomes

Further wish list:

- Cell densities
- Environmental parameters
- Microarrays

To express formal interest in participating in OSD as a data generation partner please fill in this brief form:

<https://www.surveymonkey.com/s/PQ8YMP5>

The OSD Team will follow up if we have further questions. For further information or to discuss ideas please contact the OSD Team via **osd-contact@microb3.eu**.

EXPRESSION OF INTEREST:

- Main contact and affiliation
- Short summary of your offered contribution to OSD
- Type of data you would like to generate and Why
- Scientific Contributions/Hypotheses to be tested
- How much DNA is required from each sample
- How many samples you are willing to analyze
- A costing for the contribution (in kind costs)
- Any further comments



Funding to Support OSD June 2014 Data Generation Activities

As part of ramping up OSD for 2014 we will be making available **a limited budget of roughly 50k Euros** for data generation activities under an open competition. We would like to be able to fund the engagement of as many groups as possible and will be seeking further funding so we welcome ideas for partnerships.

Please make your expression of interest by December 15th for consideration by the OSD Committee in January 2014.

All proposals will be judged first on scientific merit and activities that will be prioritized for contributed funding will include those that:

- offer significant in kind contributions to OSD
- align well with the existing efforts and priorities of OSD
- extend the breadth of taxonomic coverage of OSD
- extend the breadth of loci examined in OSD
- enable the comparison of OSD data to existing datasets
- help to build the OSD Consortium

THE RESPONSE

Working with the community, the OSD Committee iteratively explored options. As a result of the open call, 13 data generating partners (sequencing centres) were contacted and 7 of them short-listed based on formal expressions of interest (See Table below). All the expressions of interest involved analysis of bacterial sequences. All expressions of interest covered either 16S sequencing analysis or metagenomic shotgun analysis. All candidate data generators and their responses were catalogue in an online spreadsheet maintained by the OSD Core team and shared with the entire OSD Committee. A truncated version of the spreadsheet is presented as a table below.

We were extremely pleased that PacBio have offered in kind sequencing of 10-12 samples vastly improving OSD 2014.



Sequencing Center	Response	What	Grand Total (€)
UCSC - Jed Fuhrman	TBC by May 1	Primer	in-kind, perhaps shipping charges
Helgoland	yes	Premises for DNA Extraction	OSD Team to perform DNA extraction 3000 for consumables
Argonne - Jack & Jed	yes	EMP Primers + 16S + Metagenomes	72,096
LGC Genomics Berlin	yes	16S + Metagenomes	43,000
MrDNA	yes	16S + Metagenomes	64,005
PacBio	yes	SMRT	in-kind, 10-12 samples
Woods Hole	yes	V6 Primers	25,191

Table 1. List of Potential Data Generating Partners for OSD 2014. Potential partners contacted who were not able to offer a suitable quote for this work included: Genoscope (France, viral, protist sequencing), NBAF-Liverpool (UK, bacterial sequencing), GATC (Germany), Smithsonian (US, DNA barcoding), Birmingham BGI (UK, not ready to sequence such samples), Testing & Research Lab, MPG Center in Cologne (Germany), Lausanne University (Switzerland).

SELECTION OF BEST OPTION

We had several committee meetings to iterate over the options and refine them. We had to weigh up several issues but in the end there one clear option emerged, sequencing with the European company LGC. In our deliberations we weighed up cost, risk, collaborative value and need the end of our discussions the value of saving some funds for an OSD in 2015. We also weighed up the amount of data to be generated per cost (i.e. number of reads), quality ensured, timelines, and the type of data to be generated. We greatly valued ongoing and new academic collaborations but they were more costly in terms of price because of the added value contributions of helping to analyze the data. We could have ideally spent a



much larger budget than we had available but in the end had to make a final decision. Another development that occurred during this process is the transfer of DNA isolation activities from Argonne, which was done in kind for OSD pilot events, to Helgoland in Europe. The transfer to Helgoland freed up more budget and made possible the chance to just buy-in sequencing from a company.

In the end the committee selected to go with the quote from LGC. The benefits of going with a commercial company included the following:

- Exact service defined
- Little risk
- European base
- best quote, affordable price

The risks of not continuing with ANL was outweighed by the fact that this was a one-off event and we had budget. The committee strongly expressed interest in keeping open the option to gladly work with other partners in the future, especially when involving in kind contributions.

FINAL VOTE AT General Assembly 25.04.2014

Reallocate 80,000 Euro out of 90,000 Euro for sequencing of OSD samples

Keep 10,000 Euro for supporting sampling sites e.g. for filters, shipping etc.

21 yes

1 abstention