



Published in final edited form as:

Metabolomics. 2015 February ; 11(1): 3–5. doi:10.1007/s11306-014-0755-6.

Introducing the USA Plant, Algae and Microbial Metabolomics Research Coordination Network (PAMM-NET)

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The USA National Science Foundation (NSF) recently funded a Research Coordination Network (RCN) grant (Award # 1340058) in September 2013. The primary goal of the RCN is the development of a USA Plant, Algae and Microbial Metabolomics Research Coordination Network (PAMM-NET) that will promote effective communication, enhance opportunities for collaboration, build community consensus, identify key challenges in metabolomics, and facilitate coordinated community empirical efforts to meet these challenges. Participation in the USA PAMM-NET is open to the public, and PAMM NET will interact with existing and future international metabolomics organizations and communities.

The Specific Aims of the USA PAMM-NET are to:

- Unify and facilitate greater collaboration between the awardees of the USA National Science Foundation and Japanese Science and Technology Agency (NSF-JST) Metabolomics for a Low Carbon Society Program
- Build a collaborative and cooperative metabolomics research coordination network within the United States

- Update plant, algae and microbial metabolomics reporting standards
- Train and promote the next generation of metabolomics researchers
- Correspond with and engage large informatics groups for the development of metabolomics tools and databases
- Build a cooperative international network to pursue cooperative international funding opportunities that address the grand challenges of metabolomics

PAMM-NET was jointly initiated by four independent and international projects funded through the joint NSF-JST Metabolomics for a Low Carbon Society program (http://www.nsf.gov/news/news_summ.jsp?cntn_id=122045&org=NSF&from=news). The unification of these projects' efforts will further amplify NSF's investment in plant, algae and microbial metabolomics, and is being achieved through regular videoconferences and annual face-to-face program meetings and workshops. The NSF-JST team will serve as a nucleus to build a more unified national network of researchers that will identify key challenges and develop strategies to surmount barriers that impede the full utilization of metabolomics. A PAMM-NET coordinator serves as a dedicated advocate for the organization, facilitates integration, and provides logistical support for consensus reporting of the network outcomes. The NSF-JST team and the PAMM-NET coordinator will recruit public participants from the USA and global plant, algae and microbial metabolomics communities to build working focus groups that will identify and discuss the current grand challenges associated with metabolomics and potential solutions to these challenges. The PAMM-NET recognizes that addressing many of these challenges will require the involvement of the larger biology, technology, and bioinformatics communities. Therefore, PAMM-NET will recruit feedback and active participation from these diverse groups to best formulate empirical solutions to the grand challenges. Some of the challenges for which PAMM-NET will facilitate coordinated community efforts include:

- Metabolite annotation and identification
- Mapping and understanding temporal and spatial metabolite distributions (e.g., imaging, atlases, etc.)
- Developing national and international metabolomics databases and repositories
- Improving metabolomics measurements, including dynamic range, sensitivity, selectivity, remote sensing, and non-invasive measurement
- Exploring the interaction of multiple species and metabolomes to understand the role of diversity in ecological and microbiome contexts
- Applying metabolomics in metabolic engineering, genome editing, and synthetic biology
- Functional analysis of as-yet unknown metabolites
- Enhancing the professional development of early career scientists

PAMM-NET will reach out to other established scientific communities and organizations, such as the bioinformatics community, the newly formed USA NIH Common Fund Metabolomics Consortium and the international Metabolomics Society, to communicate these and other key challenges and to recruit expertise and participation in solutions to the key challenges. PAMM-NET will also cooperate with other federally funded programs, such as the NIH Common Fund supported National Metabolomics Centers, to better coordinate efforts across federal funding divisions and scientific disciplines. Finally, PAMM-NET will initiate conversations with the global metabolomics community to identify and pursue cooperative international metabolomics funding opportunities that address the grand challenges of metabolomics. A coordinated community effort is expected to be more cordial, efficient, and productive, leading to new and enabling scientific discoveries and innovations.

PAMM-NET will also play a catalytic role in building a more coordinated metabolomics community within in the United States. Many members of the PAMM-NET have already contributed to the building of the international Metabolomics Society that has grown to over 700 members. Although the international Metabolomics Society provides important international services, many members face the major challenge of geographical travel restrictions associated with the attending the Metabolomics Society's rotating international conferences. Due to this challenge and additional local needs, several countries have developed more localized communities that interact on a regular basis and compliment the major functions of the parent Metabolomics Society. Thus, PAMM-NET will work with the Metabolomics Society Board to explore the creation of a USA Chapter or International Affiliate of the Metabolomics Society in close coordination with other networks and organizations that will extend the activities of the parent Metabolomics Society.

The USA Chapter of the Metabolomics Society will serve a diverse group of metabolomics scientists within the United States (and possibly North America) who have interests that extend far beyond the immediate interests of the NSF-JST or NIH Metabolomics Common Fund program and projects. It is envisioned that the USA Chapter will organize complementary local and national themed workshops, organize national metabolomics meetings in years when the Society's meeting is overseas, and coordinate efforts and interactions across the USA. The USA National Chapter will also be a more accessible venue for scientists that cannot afford or commit time for international travel, and it will provide additional opportunities for early career metabolomics scientists. The PAMM-NET organizers are working towards this goal in consultation with the international Metabolomics Society, which has previously developed a network of associated regional organizations to facilitate interactions and communications. The ultimate intent for the USA Chapter is to enter into a productive collaboration with the international Metabolomics Society to maximize international interactions and minimize redundancy and competition.

In summary, the ultimate goal of both PAMM-NET and the USA Chapter of the Metabolomics Society is to promote effective communication, enhance opportunities for national/international collaboration, build community consensus, identify key challenges in metabolomics, and facilitate coordinated community empirical efforts to meet these challenges. A coordinated community effort is expected to be more cordial, efficient, and productive; leading to new and enabling scientific discoveries and innovations. We invite

you to unite with us and contribute efforts towards further enhancement of our national expertise and capacity in metabolomics. Our inaugural event will take place at the 11th annual meeting of the international Metabolomics Society which will be located in San Francisco/Burlingame, June 29-July 02, 2015 (<http://metabolomics2015.org>). We will start with a pre-conference workshop focused on recent activities of the NSF-JST project on June 28, followed by a workshop on the formation of the U.S. Chapter on Tuesday evening, June 30, 2015. We invite you to join us there!

We invite you to visit and/or join one or more of our following websites and social pages:

<http://pamm-net.org/>

<http://pamm-net.org/us-chapter-of-metabolomics-society/>

http://nsf.gov/funding/pgm_summ.jsp?pims_id=503558

<http://nsf-jst-metabolomics.org/>

<https://www.facebook.com/groups/PAMMNET/>

<https://www.linkedin.com/groups/Plant-Algae-Microbial-Metabolomics-Research-6715710>