

Gordon Research Conference and Seminar

Molecular Basis of One-Carbon Metabolism

30 July – 5 August

Waterville Valley, NH

Follow-up Report

The 10th Gordon Research Conference on the Molecular Basis of Microbial One-Carbon Metabolism (C₁-GRC) and associated Seminar for young researchers were held from July 30 to August 5, 2016 in Waterville Valley, New Hampshire, USA. Both the C₁-GRC conference and GRS seminar featured the wide-ranging metabolic diversity of autotrophic microbes, methanogens, acetogens, methylotrophs and methanotrophs. All aspects of anaerobic as well as aerobic microbial C₁ metabolism were covered, providing complementary cross-disciplinary perspectives from researchers at the forefront of current understanding of microbial metabolism, in the fields of microbiology, biochemistry, structural biology, ecology and evolution, and synthetic biology. New applications of microbial C₁ metabolism, e.g. for production of biofuels and high added value chemicals, and for bioremediation of environmental contamination, were also presented.

As in previous editions of this long-running meeting, the 2016 conference brought together junior and senior investigators from the microbial C₁ research community. For the third time, the 2016 C₁-GRC was paired with a two-day Graduate Research Symposium (GRS) immediately before the GRC at the same site, actively contributing to integrate younger members of the community into this dynamic and expanding field of research in Microbiology. This GRS, chaired by Dipti Nayak, University of Illinois at Urbana-Champaign, and Kai Schuchmann, University of Nottingham, UK, was a full success, with a record 63 participants, and a total of 12 talks – 10 by graduate students and postdocs chosen from the participants, and 2 by more senior members of our community.

The GRC itself also showed a record attendance, with 156 participants in total. The meeting showed unprecedented high levels of participation of young scientists, junior talks, and participants from all parts of the world. In total, 48 graduate students, 24 postdocs, and 13 assistant professors (54% of total) participated at the GRC, a clear indication of the vitality and openness of our research community. A similar percentage of participants (56%) attended the conference for the first time.

In terms of GRC speakers and discussion leaders, there were 35 speakers and 9 discussion leaders at our conference this year. Among them, 1 was a PhD student, 2 were postdocs, and 2 were assistant professors; 4 additional speakers also qualified as Early Career Scientists under the definition of GRC (i.e., PhD degree less than 10 years ago). It should also be pointed out that 5 of the 44 speakers and discussion leaders were from Asia (2 Japanese, 2 Chinese, 1 Korean), also a record for our GRC. The proportion of North American to European speakers was almost exactly one to one (20:18), the corresponding proportion among participants was two to one.

For discussion leaders, priority was given to experienced, leading colleagues of our community. One Discussion Leader, Prof. Lisa Stein (University of Alberta, Canada), also chaired a new program element entitled "Power Hour: Committed to inclusion and the professional development of women in science." The GRC Power Hour, an optional informal gathering open to all meeting participants, was introduced to help address the challenges women face in science and support the professional growth of women in our communities.

In this context, the gender balance of speakers and discussion leaders (36%) slightly exceeded that of participants to our conference (33% women). Very encouragingly, gender balance among senior speakers and discussion leaders was exactly one to one at the GRS pre-conference, and 4 out of 10 talks by early career scientist (PhDs and postdocs) were given by women.

As in past meetings, the C1-GRS featured 2 poster sessions, and the C1-GRC 4 poster sessions in the afternoons. In total, some 102 posters were presented. Poster Prizes in the form of an allocation towards their registration fee were awarded by a jury composed of the younger leading scientists of our community, and presented to their recipients in plenary session at the Conference close.

The conference featured several talks with a relation to astrobiology and the early terrestrial biosphere, most notably that of Dr. Gary King (University of Louisiana), who gave a talk entitled "Carbon Monoxide as Survival Substrate in Water-Stressed Extreme Terrestrial and Extraterrestrial Systems". The meeting was also the opportunity to develop new collaborations in this area, e.g. the MMARS (Microbial Methane Associated Research Strasbourg) collaborative project for research on the International Space Station, currently under way. Developments in this rapidly expanding field on aspects of microbial one-carbon metabolism are clearly to be foreseen, and will certainly be a focal point of future editions of our Conference. Indeed, the upcoming 2018 GRC conference, with multiple NASA Astrobiology Institute Awardee Prof. Victoria Orphan (Caltech) as the new Chair, will feature a new session entitled "C1 Metabolism: Implications for Early Earth and Astrobiology".

We thank NASA again for its very generous support at this conference. It allowed to provide support for the registration of PhD students, postdocs, and young faculty at both GRS and GRC. Feedback on the meeting obtained during and after the conference, both informally and as documented by the official GRC questionnaires filled in during the meeting, concur to attest that the meeting was a great success. It seems fair to say that the community is looking forward to another milestone conference in 2018.

Stéphane Vuilleumier, Chair, 2016 GRC Molecular Basis of Microbial One-Carbon Metabolism