

## **NC1194: Nanotechnology and Biosensors**

Annual Meeting, June 4-5, in Coordination with 2018 Gordon Research Conference -

Nanoscale Science and Engineering for Agriculture and Food Systems

Mount Holyoke College  
50 College Street, South Hadley, MA

### **Business Meeting held at:**

**Grandmary's Bed & Breakfast, 11 Hadley St., South Hadley MA**

### **Minutes**

Meeting started at 1:45 PM, June 4, 2018 (with break at ~4 PM, resuming at ~1:30 PM on June 5 and concluding June 5 about 4 PM), with following members in attendance

**Tzuen-Rong Jeremy Tzeng**, Clemson University -  
Acting Chair

**Fanbin Kong**, UGA - Acting Vice Chair

**Daniel M. Jenkins**, University of Hawaii - Acting  
Secretary

**Steve Lommel**, NCSU - Administrative Advisor

**Hongda Chen**, USDA-NIFA - Bioprocess  
Engineering and Nanotechnology

**Eric McLamore**, University of Florida

**Jose Reyes-de-Corcuera**, UGA

**Jonathan Claussen**, Iowa State University

**Carmen Gomes**, Iowa State University

**Chengxu Yu**, Iowa State University

**Evangelyn Alocilja**, Michigan State University

**Paul Takhistov**, Rutgers University

**Sundaram Gunasekaran**, University of  
Wisconsin Madison

**Joel Pedersen**, University of Wisconsin Madison

**Anhong Zhou**, Utah State University

1. Introductions
2. Disposition / election of officers
  - a. Jeremy is acting as chair (on behalf of Jenna Rickus from Purdue who has recently assumed additional administrative responsibilities as Provost), Fanbin Kong is acting as vice-chair in lieu of Mengshi Lin (University of Missouri), and Daniel Jenkins was delegated to act as secretary.
  - b. Given that all "acting" officers served on an ad-hoc basis, it was agreed unanimously that they will continue to serve in these positions officially for the upcoming year (2018 – 2019 culminating in 2019 annual meeting).
3. Administrative update (Steve Lommel, Hongda Chen)
  - a. Hongda Chen provided an overview of on-going NIFA sponsored Nanotechnology projects, and encouraged the group to submit proposal for upcoming Sustainable Agriculture opportunity:  
<https://nifa.usda.gov/funding-opportunity/afri-sustainable-agricultural-systems-competitive-grants-program>
  - b. Steve Lommel introduced himself (he agreed to serve as administrative officer for the project, subsequent to the retirement of Vincent Bralts from Purdue University)

#### 4. Brief station reports/updates

- a. Florida (Eric McLamore): Publicized a USDA supported conference on food engineering in September 2018 <https://socfoodeng.org/cofe/>, as well as an on-going project / initiative to compile a virtual “sandbox” of nanotechnology resources for water quality for agricultural producers / growers
- b. Missouri (Fanbin Kong on behalf of Mengshi Lin): Summarized progress on developing nanostructures / nanosubstrates for SERS building on cellulose nanofiber composites, and applications for biosensing (full report available elsewhere)
- c. Hawaii (Daniel Jenkins): Summarized progress in developing open source palm-sized wireless potentiostat to accelerate the commercialization of point-of-use diagnostics for agriculture / food safety / water quality. Hardware is currently available for testing, and Android interface is freely available on Google Play: [https://play.google.com/store/apps/details?id=com.diagenetix.abestat&hl=en\\_US](https://play.google.com/store/apps/details?id=com.diagenetix.abestat&hl=en_US)
- d. Michigan (Evangelyn Alocilja): Overview of advances in nanoparticle assisted rapid recovery of pathogens, including some video demonstration; report on expanding international network of opportunities for developing diagnostics in under-resourced communities, including dedication of building space for the “Global Alliance for Rapid Diagnostics In Peru” (<https://www.egr.msu.edu/alocilja/GARD-location/global-alliance-rapid-diagnostics-peru>)
- e. South Carolina (Jeremy Tzeng): Advances in nanoparticle development for anti-microbial applications, including improvement in selectivity)
- f. Wisconsin (Joel Pedersen and Sundaram Gunasekaran): Call for collaboration with University of Wisconsin Center for Sustainable Nanotechnology <https://susnano.wisc.edu/>, a \$4M / year 3 year effort to develop sustainable nanotechnology for societal benefit; Sundaram summarized advances in research for developing nanoparticle enabled technologies for low-cost time temperature integrators, smart packaging, and diagnostics including for cancer screening.
- g. Iowa (Chenxu Xu, Jonathan Claussen, and Carmen Gomes): Chenxu summarized research progress related to nanoparticles and biomaterials, i.e. characterization of formation and properties of high quantum efficiency carbon nanotubes during grilling of meats, and localization of particles in plant and animal tissues (mouse and sprouts), and potential use as fluorescent labels.
- h. New Jersey (Paul Takhistov): Summary of ongoing projects related to nanotechnology for edible films, pathogen control and detection.

#### 5. Multi-station collaboration/projects/ideas

- a. The USDA-NIFA solicitation for projects related to sustainable agriculture (\$10 M each for 5 years, articulating long term / 25 year vision for transformational change for improved sustainability of the food system) was identified as a good opportunity for the group to develop more highly coordinated and impactful collaboration(s): <https://nifa.usda.gov/funding-opportunity/afri-sustainable-agricultural-systems-competitive-grants-program>

- b. Significant discussion ensued related to the potential scope of a project, and the appropriate vision (some advocated for a broad set of objectives addressing multiple challenges to agriculture; others advocated for a more focused set of objectives with strong emphasis on strengths of group in sensors for improving decision support for food safety and agriculture).
  - c. Of the five priority 25-year goals supported by the program, it was decided that the last was most strongly aligned with the strengths of NC-1194 members: "Reduce food-borne illnesses to 8.5 cases per 100,000 people in the U.S. population per year..."
  - d. Members recommend addressing several key issues in response to solicitation, including improving traceability at critical control points, inclusion of veterinarian / ecologist epidemiologists to help understand ecological dispersion of pathogens, focus on livestock / animal biosecurity, inclusion of social / behavioral scientists especially to influence understanding and behavior of public.
  - e. Letter of intent is due June 27 (with full proposal due October 10).
  - f. Sundaram Gunasekaran volunteered to coordinate the submission of a letter of intent, with the assistance of Paul Takhistov and Evangelyn Alocilja (and contributions from all members).
6. Future meetings: format and locations
- a. The rotation of venues was discussed in some detail- Steve Lommel especially encouraged the group to consider periodically holding meetings completely separate from other meetings to improve the focus / collaborative culture of the group.
  - b. Members generally agreed to try to reestablish the practice of holding meetings in alternating years to meet hosted explicitly by one state / experiment station to explore the facilities / resources / opportunities there, and more focus more exclusively on opportunities for collaboration / interaction.
  - c. Members also encouraged the group to have longer term more predictable plan for meeting events (i.e. regularly in coordination with a conference, and/or hosted by experiment station where the program chair is housed) so that more meeting time could be devoted to meaningful collaboration, rather than identifying meeting location for upcoming year.
  - d. Hongda Chen and others encouraged the group to consider meeting again with the next GRC Nanoscale Science meeting (planned for 2020).
  - e. Iowa State University, Michigan State University, and Rutgers University were proposed as sites for 2019 meeting. Following discussion of the merits of each, members voted tentatively to have 2019 meeting hosted by Rutgers University (generously agreed to by Paul Takhistov)
  - f. Membership voted to hold 2019 meeting in New Jersey organized by Paul Takhistov, and 2020 meeting in coordination with next iteration of GRC Nanoscale Science and Engineering for Agriculture and Food Systems.
7. Meeting adjourned June 5, 2018, ~ 4 PM.