Curriculum Vitae – Javier A. Ceja-Navarro

AREAS OF EXPERTISE

- Metazoan's biology and microbiology.
    - Metazoans physiology characterization using fine scale techniques – dissections of animals with size ranging from 0.5 mm and larger; use of microelectrodes for the characterization of the metazoan's physiology (Oxygen, Hydrogen, pH and redox gradients).
    - Isolation of microorganisms from metazoans' guts. Development of media for selective isolations.
    - Optimization of DNA/RNA extraction procedures from metazoans and other environmental samples.
    - Maintenance of eukaryotic cell lines and transfection techniques.
- Soil microbiology and study of biogeochemical cycles.
    - Analysis of the effect of human activities on soil microbial communities by microbiological and molecular approaches;
    - Microbial isolations from soil and environmental samples;
    - Analysis of the expression of genes as proxies of biogeochemical cycling by RT-qPCR and Gas Chromatography.
- Application of omics' approaches for the study of environmental systems.
    - Characterization of microbial communities and insects' populations using cloning and Next Generation Sequencing (NGS) of molecular markers such as 16S and 18S rRNA, COI genes.
    - Preparation of fosmid libraries and functional screening.
    - Generation and analysis of metagenomic and metatranscriptomic libraries.
- NGS data analysis, Programming and Statistics.
    - Quality control of NGS generated data; Use of Velvet, IDBA_UD for metagenome assembly; Screening of genes by HMMER search; Binning and extraction of genomes from metagenomes based on coverage and composition.
    - Use of Python/Perl for bioinformatics and R for statistical analyses.

PERSONAL DATA

Nationality:	Mexico
Present address:	2209 Jefferson Ave, apt # 4 Berkeley, CA, 94703 Tel: 510-926-8981 Email: JCNavarro@lbl.gov

WORK EXPERIENCE (EMPLOYMENT RECORD)

- From August 2010 till now
  Lawrence Berkeley National Laboratory, ESD, Ecology Department – USA
  Position: Project Scientist – (Since December 2014)
  Position: Postdoctoral fellow (July 2011 – December 2014)
  Position: Visiting Scientist (August 2010 – July 2011)
  Projects:
  Study of the role of microbial communities associated with a coffee pest (*Hypothenemus hampei*) in the transformation of caffeine. Characterization

of the microbial communities associated with *H. hampei* from samples collected around world; isolation of the caffeine degrading bacteria from the insect's guts. Expression of the caffeine degrading genes was detected by RT-qPCR. The microbiome of the insects was manipulated to control their ability to degrade caffeine.

Characterization of the potential for biofuel production stored in the wood-feeding beetle *Odontotaenius disjunctus*. Multifaceted study of the insect's gut as a compartmentalized environment for wood transformation and hydrogen production. The gut environment was characterized with microelectrodes, the associated microbiota identified, functional screening of fosmid libraries and metagenomic analyses were performed, and the transformation of the wood food in the beetle's gut described. Functional microscopy is being developed to determine the spatial distribution of microbes.

The soil-metazoan microbiome, a functional compartment of importance to plant health and nutrient cycling. Use of multi-scale approaches to identify soil metazoans and their symbiotic microorganisms. The project aims to elucidate the role of the associated microbiome in the cycling and availability of nutrients such as N, P and C in soil. Functional distribution of nutrient cycling organisms will be assessed by functional microscopy.

Other responsibilities: Mentoring of undergraduate and graduate students in the area of insect microbiota research and related molecular techniques and laboratory equipment.

- From November 2009 to August 2010
  International Maize and Wheat Improvement Center (CIMMYT, Int.) - Mexico
  Position: Scientific Consultant
  Project: Development of a high-throughput platform for the screening of molecular markers associated with wheat traits.
  Other responsibilities: Mentoring of technical staff.

EDUCATION

- M.Sc./Ph.D. – Biotechnology and Bioengineering (2005 -2009)
  Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV-IPN), Mexico
  Department of Biotechnology and Bioengineering
  Thesis: ***The effect of agricultural practices on soil microbial communities.***
  Research focused on the analysis of the effect of different agricultural practices on soil bacterial communities and their processes using molecular and analytical techniques.
- B.Sc. – Chemical Engineer (2000-2005)
  Instituto Tecnologico de Celaya, Mexico
  Department of Chemical Engineering
  Research: ***Study of the kinetics for the large-scale production of Sodium Benzoate.*** Modeling and optimization of industrial processes with main focus on the study of chemical reactors.

STUDY STAYS

Visiting scholar at University of California Berkeley, USA
Biophysics department, Bustamante Group – work on the study of mitochondrial genetic dynamics, gene transfection and the use of Atomic Force Microscopy as a tool for gene delivery in eukaryotic cells and mitochondria.

- Fellowship of the Mexican Government (December 2008 – July 2009).

OTHER SKILLS AND KNOWLEDGE

Languages: Spanish –mother language
English – fluent

FUNDED PROPOSALS

- **The soil metazoan microbiome: A key functional compartment of importance to plant health and root carbon stabilization.** LDRD, FY 2015. Role: PI
- **Identifying the key organisms, pathways and locations of lignocellulosic biomass transformation and hydrogen production in wood-feeding Passalid beetles**. EMSL-DOE, 2014. Role: Postdoc/Senior Personnel.
- **Identifying the key organisms, pathways and locations of hydrogen fermentation from lignocellulosic biomass in wood-feeding Passalid beetles.** EMSL-DOE, 2013. Role: Postdoc/Senior Personnel.

PUBLICATIONS

Published

1. **Ceja-Navarro, J.A.,** Nguyen, N.H., Karaoz, U., Gross, S.R., Herman, D.J., Andresen, G., Bruns, T.D., Pett-Ridge, J., Blackwell, M., Brodie, E.L. 2014. Compartmentalized microbial communities, oxygen gradients and nitrogen fixation in the gut of *Odontotaenius disjunctus. ISME J.* 8:6-18.

2. **Ceja-Navarro, J.A., Brodie, E.L., Vega, F.E.** 2012. A technique to dissect the alimentary canal of the coffee berry borer (*Hypothenemus hampei*), with isolations of internal microorganisms. *JEAR* 44:117-119.

3. **Ceja-Navarro, J. A.**, Rivera, F.N., Patiño-Zuñiga, L., Vila-Sanjurjo, A., Crossa, J., Govaerts, B., Dendooven, L. 2010. Phylogenetic and multivariate analyses to determine the effect of different tillage and residue management on soil bacterial communities: Phylogenetic and multivariate analyses. *Appl. Environ. Microbiol.* 76: 3685-3691.

4. **Ceja-Navarro, J. A**., Rivera, F.N., Patiño-Zuñiga, L., Govaerts, B., Marsch, R., Dendooven, L. 2010. Molecular analysis of soil bacterial communities in contrasting zero tillage systems. *Plant Soil* 329:127-137.

5. Patiño-Zúñiga, L., **Ceja-Navarro, J.A.**, Govaerts, B., Luna-Guido, M., Sayre, K.D., Dendooven, L. 2009. The effect of different tillage and residue management practices on soil characteristics, inorganic N dynamics and emissions of N_2O, CO_2 and CH_4 in the central highlands of Mexico: a laboratory study. *Plant Soil* 314: 231-241.

6. Montoya-Gonzalez, A., Gonzalez-Navarro, O.E., Govaerts, B., Sayre, K.D., Estrada, I., Luna-Guido, M., **Ceja-Navarro, J.A**., Patiño-Zuniga, L., Marsch, R., Dendooven, L. 2009. Effect of straw management, crop rotation and nitrogen source effect on carbon and nitrogen dynamics and nitrous oxide emissions: a laboratory study. *Plant Soil* 325: 243-253.

In review or preparation

1. **Ceja-Navarro, J.A.,** Vega, F.E., Hao, Z., Jenkins, S., Hsiao-Chien, L., Kosina, P., Infante, F., Northen, T., Brodie, E.L. **Gut microbiota mediate caffeine detoxification in the primary insect pest of coffee.** In review, Nature Communications.
2. Vega, F.E., Brown, S.M. Chen, H., Shen, E., **Ceja-Navarro, J.A.**, Brodie, E.L., Infante, I., Pain, A. **Draft genome of the most devastating insect pest of coffee worldwide: the coffee berry borer, *Hypothenemus hampei*.** Submitted, Genome Research.
3. Ceja-Navarro, J.A., Karaoz, U., Hao, Z., Bill, M., Filley, T., Conrad, M., Pett-Ridge, J., Brodie, E.L. **Metagenomic and geochemical analysis to unveil the potential for lignocellulose degradation stored in the passalid beetle, *Odontotaenius disjunctus.*** In Prep.

INVITED TALKS:

1. **Ceja-Navarro, J. A.** Science at the Theater – 5 Big Questions. Do insects contain the secrets for sustainable food and energy production? – April, 29, 2015. Oakland, CA. https://youtu.be/kwCi0fD00zg

2. **Ceja-Navarro, J.A.** The soil mesofauna and the food web. Lecture at UC-Berkeley. February 09, 2015. Berkeley, CA.

3. **Ceja-Navarro, J. A.,** Brodie, E. L. Insects empowered by microbes. Seminar Series of the Life Sciences Division, LBNL. May 27, 2014. Emeryville, CA, USA.

4. **Ceja-Navarro, J. A,** Brodie, E. L. Insects empowered by microbes. Coloquium at the Sonoma State University. January 29, 2013. Sonoma, CA, USA.

5. **Ceja-Navarro, J.A.** Microbes and Evolution, the Hologenome Theory. Lecture at the Sonoma State University. January 29, 2013. Sonoma, CA, USA

6. **Ceja-Navarro, J. A.,** Brodie, E.L. Insects Empowered by Microbes. Seminar series – Friends of Cinvestav. July 06, 2012. Cinvestav, Irapuato, Mexico.

CONFERENCES:

Oral presentations:

1. **Javier A. Ceja-Navarro**, Fernando E. Vega, Zhao Hao, Hsiao-Chien Lim, Petr Kosina, Francisco Infante, Eoin L. Brodie. **The microbiome of the primary coffee pest**

***Hypothenemus hampei*, and its role in caffeine detoxification.** Seventh International Symposium on Molecular Insect Science. July 2014. Amsterdam, The Netherlands.

2. **Javier A. Ceja-Navarro**, Fernando E. Vega, Ulas Karaoz, Hsiao-Chien Lim, Peter K. Weber, Zhao Hao, Hoi-Ying Holman, Jennifer Pett-Ridge, Eoin L. Brodie. **Microbial communities associated with the coffee berry borer (*Hypothenemus hampei*; Coleoptera: Curculionidae) and their role in caffeine metabolism.** ISME14 The Power of the Small. 2012. Denmark, Copenhagen.

Poster Presentations:

3. **Javier A. Ceja-Navarro**, Ulas Karaoz, Mari Nyssoonen, Mary S. Lipton, Joshua N. Adkins, Kristin E. Burnum-Johnson, Markus Bill, Timothy Filley, Mark Conrad, Xavier Mayali, Peter K. Weber, Meredith Blackwell, Jennifer Pett-Ridge, Eoin Brodie. **A systems biology characterization of the biotechnological potential stored in the wood-feeding beetle *Odontotaenius disjunctus.*** ASM General Meeting, 2014, Boston, MA, USA.
4. **Javier A. Ceja-Navarro*** (JCNavarro@lbl.gov), Ulas Karaoz, Mari Nyssoonen, Mary S. Lipton, Joshua N. Adkins, Kristin E. Burnum-Johnson, Markus Bill, Timothy Filley, Mark Conrad, Xavier Mayali, Peter K. Weber, Meredith Blackwell, Jennifer Pett-Ridge, Eoin Brodie. **A systems biology characterization of the biotechnological potential stored in the wood-feeding beetle *Odontotaenius disjunctus.*** JGI general users meeting, 2014, Walnut Creek, CA, USA.
5. Javier A. Ceja-Navarro, Mari Nyyssönen , Marcus Bill, Mark Conrad, Zhao Hao, Timothy Filley, Meredith Blackwell, Jennifer Pett-Ridge, Eoin L. Brodie. **The passalid beetle (*Odontotaenius* disjunctus) and its microbial functional potential: Lignocellulosic deconstruction to potential biofuels. ASM general meeting 2013. Denver, Colorado, USA.**
6. Javier A. Ceja-Navarro, Nhu H. Nguyen, Mari Nyyssönen, Ulas Karaoz, Zhao Hao, Hoi-Ying Holman, Meredith M. Blackwell, Jennifer Pett-Ridge, and Eoin L. Brodie. **A multi-scale approach to characterize microbial communities and their physiology in the wood-feeding beetle *Odontotaenius disjunctus.* ASM general meeting. 2012. San Francisco, California, USA.**
7. Javier A. Ceja-Navarro, Xavier Mayali , Peter K. Weber, Mari Nyyssönen, Zhao Hao, Hoi-Ying Holman, Meredith M. Blackwell, Jennifer Pett-Ridge , Eoin L. Brodie. **Characterization of H_2 Producing Microbial Communities of the Wood-Feeding Beetle *Odontotaenius disjunctus* by Multi-Scale Measurement of Metabolic Function.** Genomic Sciences Contractor-Grantee Meeting/USDA-DOE Plant Feedstock Genomics for Bioenergy Awardees Meeting. 2012. Bethesda, Maryland, USA.