

Aymerick Eudes, Ph.D.

Deputy Director of Cell Wall Biology & Engineering
Joint BioEnergy Institute, Emeryville, CA
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Research Experience

- Oct. 2016 – Present** **Biological Engineer Career Scientist**
Lawrence Berkeley National Laboratory
Biosciences Area
Berkeley, CA
- April 2016 – Present** **Deputy Director of Cell Wall Engineering**
Joint BioEnergy Institute, Feedstocks Division,
Emeryville, CA
- Jan. 2011 – Oct. 2016** **Biologist Project Scientist**
Joint BioEnergy Institute, Feedstocks Division,
Emeryville, CA
Supervisor: Dr Dominique Loqué
- Jan. 2009 - Dec. 2010** **Biologist Post-Doctoral Fellow**
Joint BioEnergy Institute, Feedstocks Division,
Emeryville, CA
Supervisor: Dr Dominique Loqué
- Jan. 2006 - Dec. 2008** **Postdoctoral Associate**
University of Florida, Horticultural Sciences
Supervisor: Prof. Andrew D. Hanson
- Sep. 2001 - Dec. 2005** **Ph.D. and Master Student**
INRA Versailles, Cellular Biology Laboratory (France)
Supervisor: Prof. Lise Jouanin
- Apr. 2001 - Aug. 2001** **Undergraduate Student**
INRA Dijon (France), Legume Physiology and Genetics Research Unit
Supervisor: Prof. Sergio J. Ochatt

Training / Supervisory Experience

- Apr 2018 – Present Chien-Yuan Lin, Postdoctoral Scholar, LBNL
May – Jul 2018 Pablo Bouchez, Master student, Polytech Clermont-Ferrand (France)
May – Jul 2018 Delphine Khuu, Master student, Polytech Clermont-Ferrand (France)
Mar – Jul 2018 Jessica Trinh, Research Assistant, LBNL
Mar – Sep 2016 Saeed Nassef, Undergraduate student, UC Berkeley

Mar – Sep 2016	Roland Berthomieu, Master student, École Polytechnique (France)
Feb 2016 – Apr 2017	Lucien Roux, Master student, École Polytechnique Fédérale de Lausanne (Switzerland)
Nov 2014 – Jun 2016	Anagh Sinha, , Undergraduate student, UC Berkeley
Nov 2014 – Jun 2016	Nanxia Zhao, Undergraduate student, UC Berkeley
Feb 2014 – Sep 2016	Veronica Teixeira Benites, Undergraduate student, UC San Francisco
Jul – Oct 2015	Maxence Mouille, Master student, University of Tours (France)
Feb 2014 – May 2015	Sasha Yogiswara, Undergraduate student, UC Berkeley
Jan – Jul 2011	Valerie Cornuault, Master student, University of Leeds (UK)
Jan – Jul 2010	Davy Baratiny, Master student, University of Strasbourg (France)
Jan – Aug 2005	Guillaume Le Mignon, Master student, University of Paris VII (France)

Education

- 2005 **Doctorate****
University of Paris XI, France
French National Institute for Agricultural Research (INRA), Versailles
Supervisor: Prof. Lise Jouanin
Thesis: Characterization of new genes involved in secondary cell wall formation in Arabidopsis
- 2002 **Master's Degree****
University of Paris XI / AgroParisTech, France
Subject: Plant Molecular and Cellular Physiology
Dissertation: Identification of new genes involved in secondary cell wall formation in Arabidopsis
- 2001 **Bachelor's Degree****
University of Caen, France
Subject: Biology and Ecosystems

Publications

- 26) Li G, Jones K, **Eudes A**, Pidatala V, Sun J, Xu F, Zhang C, Wei T, Jain R, Birdseye D, Canlas P, Baidoo E, Duong P, Sharma M, Singh S, Ruan D, Keasling J, Mortimer J, Loqué D, Bartley L, Scheller H, Ronald P (2018) Overexpression of a rice BAHD acyltransferase gene in switchgrass (*Panicum virgatum* L.) enhances saccharification. **BMC Biotech**, Submitted.
- 25) Liang Y, **Eudes A**, Yogiswara S, Jing B, Benites V, Yamanaka R, Cheng-Yue C, Baidoo E, Mortimer J, Scheller H, Loqué D (2018). A screening method to identify efficient sgRNAs in Arabidopsis, illustrated with two case studies: 1. Generation of chimeric plants for essential genes. 2. Production of triallelic mutant in one generation. **Plant Biotech J**, Submitted.
- 24) Mnich E, Bjarnholt N, **Eudes A**, Harholt J, Holland C, Jørgensen B, Larsen FH, Liu M, Manat R, Meyer AS, Mikkelsen J, Motwawie M, Muschiol J, Møller B, Møller S, Perzon A, Petersen B, Ravn J, Ulvskov P (2018) Phenolic cross-links: Building and de-construction of the plant cell wall. **Nat Prod Rep**, Submitted.
- 23) Yan J, Aznar A, Chalvin C, Birdseye D, Baidoo E, **Eudes A**, Shih P, Loqué D, Aying Zhang A, Scheller HV (2018) Increased drought tolerance in plants engineered for low lignin and low xylan content. **Biotechnol Biofuels** 11:195.

- 22) **Eudes A**, Berthomieu R, Hao Z, Benites VT, Baidoo EEK, Loqué D (2018) Production of muconic acid in plants. **Metab Eng** 46:13-19.
- 21) Wu W, Dutta T, Varman A, **Eudes A**, Manalansan B, Loqué D, Singh S (2017) Lignin Valorization: Two Hybrid Biochemical Routes for the Conversion of Polymeric Lignin into Value-added Chemicals. **Sci Rep** 7:8420.
- 20) **Eudes A**, Dutta T, Deng K, Jacquet N, Sinha A, Benites VT, Baidoo EEK, Richel A, Sattler SE, Northen TR, Singh S, Simmons BA, Loqué D (2017) SbCOMT (Bmr12) is involved in the biosynthesis of triclin-lignin in sorghum. **PLOS ONE** 12:e0178160.
- 19) **Eudes A**, Mouille M, Robinson DS, Benites VT, Wang G, Roux L, Tsai YL, Baidoo EE, Chiu TY, Heazlewood JL, Scheller HV, Mukhopadhyay A, Keasling JD, Deutsch S, Loqué D (2016) Exploiting members of the BAHD acyltransferase family to synthesize multiple hydroxycinnamate and benzoate conjugates in yeast. **Microb Cell Fact** 15:198.
- 18) **Eudes A**, Zhao N, Sathitsuksanoh N, Baidoo E, Lao J, Wang G, Yogiswara S, Lee TS, Singh S, Mortimer J, Keasling J, Simmons B and Loque D (2016) Expression of S-adenosylmethionine Hydrolase in Tissues Synthesizing Secondary Cell Walls Alters Specific Methylated Cell Wall Fractions and Improves Biomass Digestibility. **Frontiers Bioeng Biotechnol** 4:58.
- 17) **Eudes A**, Yogiswara S, Wang G, Teixeira Benites V, Baidoo EEK, Lee TS, Keasling JD, Loqué D (2016) Exploiting The Substrate Promiscuity of Hydroxycinnamoyl-CoA:shikimate Hydroxycinnamoyl Transferase to Reduce Lignin. **Plant Cell Physiol** 57:568-579.
- 16) **Eudes A**, Teixeira Benites V, Wang G, Baidoo EEK, Lee TS, Keasling JD, Loqué D (2015) Precursor-directed combinatorial biosynthesis of cinnamoyl, dihydrocinnamoyl, and benzoyl anthranilates in *Saccharomyces cerevisiae*. **PLOS ONE** 10:e0138972.
- 15) **Eudes A**, Sathitsuksanoh N, Baidoo EEK, George A, Liang Y, Yang F, Singh S, Keasling JD, Simmons BA, Loqué D (2014) Expression of a bacterial 3-dehydroshikimate dehydratase reduces lignin content and improves biomass saccharification efficiency. **Plant Biotech J** 13:1241-1250.
- 14) **Eudes A**, Liang Y, Mitra P, Loqué D (2014) Lignin bioengineering. *Curr Opin Biotechnol* 26:189-198.
- 13) **Eudes A**, Juminaga A, Baidoo EE, Collins FW, Keasling JD, Loqué D (2013) Production of hydroxycinnamoyl anthranilates from glucose in *Escherichia coli*. **Microb Cell Fact** 12:62.
- 12) **Eudes A**, George A, Mukerjee P, Kim JS, Pollet B, Benke PI, Yang F, Mitra P, Sun L, Cetinkol OP, Chabout S, Mouille G, Soubigou-Taconnat L, Balzergue S, Singh S, Holmes BM, Mukhopadhyay A, Keasling JD, Simmons BA, Lapierre C, Ralph J, Loqué D (2012) Biosynthesis and incorporation of side-chain-truncated lignin monomers to reduce lignin polymerization and enhance saccharification. **Plant Biotech J** 10:609-620.
- 11) Loque D, **Eudes A**, Yang F (2011) Biomass availability and sustainability for biofuels, in *Chemical and Biochemical Catalysis for Next Generation Biofuels*. Royal Society of Chemistry. Energy and Environment Series n°4. B. A. Simmons eds. 5-32.
- 10) **Eudes A**, Baidoo EE, Yang F, Burd H, Hadi MZ, Collins FW, Keasling JD, Loqué D (2011) Production of tranilast [N-(3',4'-dimethoxycinnamoyl)-anthranilic acid] and its analogs in yeast *Saccharomyces cerevisiae*. **Appl Microbiol Biotechnol** 89:989-1000.
- 9) **Eudes A**, Kunji ER, Noiriél A, Klaus SM, Vickers TJ, Beverley SM, Gregory JF, Hanson AD (2010) Identification of transport-critical residues in a folate transporter from the folate-bioperin transporter (FBT) family. **J Biol Chem** 285:2867-75.

- 8) Rodionov DA, Hebbeln P, **Eudes A**, Ter Beek J, Rodionova IA, Erkens GB, Slotboom DJ, Gelfand MS, Osterman AL, Hanson AD, Eitinger T (2009) A novel class of modular transporters for vitamins in prokaryotes. **J Bacteriol** 191:42-51.
- 7) **Eudes A**, Erkens GB, Slotboom DJ, Rodionov DA, Naponelli V, Hanson AD (2008) Identification of Genes encoding the folate- and thiamine-binding membrane proteins in Firmicutes. **J Bacteriol** 190:7591-94.
- 6) **Eudes A**, Mouille G, Thévenin J, Goyallon A, Minic Z, Jouanin L (2008) Purification, cloning and functional characterization of an endogenous beta-glucuronidase in *Arabidopsis thaliana*. **Plant Cell Physiol** 49:1331-41.
- 5) **Eudes A**, Bozzo GG, Waller JC, Naponelli V, Lim EK, Bowles DJ, Gregory JF 3rd, Hanson AD. (2008) Metabolism of the folate precursor p-aminobenzoate in plants: Glucose ester formation and vacuolar storage. **J Biol Chem** 283:15451-59.
- 4) **Eudes A**, Pollet B, Sibout R, Do CT, Séguin A, Lapierre C, Jouanin L (2006) Evidence for a role of AtCAD1 in lignification of elongating stems of *Arabidopsis thaliana*. **Planta** 225:23-39.
- 3) Sibout R, **Eudes A**, Mouille G, Pollet B, Lapierre C, Jouanin L, Séguin A (2005) CINNAMYL ALCOHOL DEHYDROGENASE-C and -D are the primary genes involved in lignin biosynthesis in the floral stem of *Arabidopsis*. **Plant Cell** 17:2059-76.
- 2) Sibout R, **Eudes A**, Pollet B, Goujon T, Mila I, Granier F, Séguin A, Lapierre C, Jouanin L (2003) Expression pattern of two paralogs encoding cinnamyl alcohol dehydrogenases in *Arabidopsis*. Isolation and characterization of the corresponding mutants. **Plant Physiol** 132:848-60.
- 1) Goujon T, Sibout R, **Eudes A**, MacKay J, Jouanin L (2003) Genes involved in the biosynthesis of lignin precursors in *Arabidopsis thaliana*. **Plant Physiol Biochem** 41:677-87.

Patents

- 1) US Patent Application 15/056,982: Loqué D and **Eudes A**: *Modified plants and methods for producing modified lignin by modulating expression of acyltransferases.*
- 2) US Patent Application 14/774,614: Loqué D and **Eudes A**: *Tissue Specific Reduction of Lignin.*
- 3) US Patent Application 14/232,018: Loqué D and **Eudes A**: *Lignification Reduction in Plants.*
- 4) US Patent Application 13/274,244: Loqué D and **Eudes A**: *Host Cells and Methods for Producing Cinnamoyl Anthranilate and Analogs Thereof.*

Scientific Presentations

- 09/2018: Lignobiotech V Symposium, Helsinki, Finland. INVITED SPEAKER
08/2018: Gordon Research Conferences – Lignin, Easton, MA, USA
07/2017: 6th International Conference on Plant Cell Wall Biology. Dalian, China
05/2017: 39th Symposium on Biotechnology for Fuels and Chemicals. San Francisco, CA, USA. INVITED SPEAKER
06/2016: Lignobiotech IV Symposium, Madrid, Spain. CO-CHAIRMAN' session
07/2015: Gordon Research Conferences – Plant Metabolic Engineering, Waterville Valley, NH, USA. INVITED SPEAKER
08/2014: Lignin 2014 – Biosynthesis and Utilization, Umeå, Sweden. INVITED SPEAKER
07/2013: Gordon Research Conferences – Plant Metabolic Engineering, Waterville Valley, NH, USA
10/2012: Lignobiotech II Symposium, Fukuoka, Japan. INVITED SPEAKER
03/2011: Keystone Symposium Conference on Biofuels, Singapore

07/2010: 12th Plant Cell Wall Meeting, Porto, Portugal
07/2009: Synthetic Biology Workshop by the Danish Ministry of Science, July, Berkeley, California
07/2009: ASPB Meeting, Honolulu, HI, USA
07/2008: ASPB Meeting, Merida, Mexico
07/2007: ASPB Meeting, Chicago, IL, USA
06/2005: Polyphenols and Micronutrients Meeting, Versailles, France. INVITED SPEAKER
09/2005: 4th French Cell Wall Meeting, Rouen, France. INVITED SPEAKER
06/2005: 16th International Conference on Arabidopsis Research, Madison, WI, USA
05/2005: International Workshop on Growing Plants for Increased Nutritional Value, Stavanger, Norway
08/2005: 10th Plant Cell Wall Meeting, Sorrento, Italy. INVITED SPEAKER

07/2004: Plant Polysaccharide Workshop – Satellite meeting of the 22nd International Carbohydrate symposium, York, UK
05/2004: French Molecular Biology of Woody Species Society, Clermont-Ferrand, France. INVITED SPEAKER
11/2003: 2nd French Cell Wall Meeting, November 6-7 (2003), Le Croisic, France
07/2003: 5th French Plant Physiology Society Meeting, "Plant Biology and the Challenge of Functional Genomics", Orsay, France.
03/2003: Genoplante Meeting, Poitiers, France

Synergistic Activities

Collaborative work with Afigen Inc., Futuragene, Forage Genetics International, Swetree (Plant biotech companies)

Member of the American Society of Plant Biologists (ASPB)

Reviewer for PNAS, *PLOS ONE*, *Biotechnology for Biofuels*, *Applied Biochemistry and Biotechnology*, *Plant Science*, *Scientific Reports*, *BioEnergy Research*, *Plant Biotechnology Journal*, *Nature Communications*, *Bioresource Technology*, *RSC Advances*, *Planta*, *ACS Sustainable Chemistry & Engineering*, *Frontiers in Plant Science*, *New Phytologist*, *Communications Biology*, *Plants*.

Member panel for DOE SBIR/STTR FY 2017 Phase II

Member panel for DOE JGI 2017 semi-annual CSP Synthetic Biology

Honors and Awards

Joint BioEnergy Institute Outstanding ROI and Patent Award (2017)

Joint BioEnergy Institute Research Contribution Award (2015)

Joint BioEnergy Institute Inventor Award (2014)

References

Dr. Dominique Loqué

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Prof. Andrew D Hanson

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Horticultural Sciences

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Prof. Henrik Scheller

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