

CURRICULUM VITAE

University of Idaho

NAME: McDonald, Armando Gabriel

DATE: January 15th, 2015

RANK OR TITLE: Professor

DEPARTMENT: Renewable Materials Program; Dept. of Forest, Rangeland, and Fire Sciences

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DATE OF FIRST EMPLOYMENT AT UI: December 6, 2001

DATE OF TENURE: tenured, July 2006

DATE OF PRESENT RANK OR TITLE: July, 2006

EDUCATION BEYOND HIGH SCHOOL:

Degrees:

Doctor of Philosophy, York University, Toronto, Ontario, Canada. June 1993, Chemistry. Thesis "Lipopolysaccharides from *Campylobacter*," Supervisor: Dr G.O. Aspinall, Examiner: Dr. J.C. Richards (NRC, Ottawa)

M.S., University of Otago, Dunedin, New Zealand, May 1986, Chemistry, with Distinction. Thesis "Glucofructan Polysaccharides," Supervisor: Dr. D.J. Brasch

Post Graduate Diploma in Science in Chemistry, University of Otago, Dunedin, New Zealand, May 1984,

B.Sc., University of Otago, Dunedin, New Zealand, May 1983, Chemistry and Applied Chemistry

Certificates and Licenses:

Managerial Excellence Programme. Certificate of Practicing Management, December 1999. New Zealand Institute of Management and University of Waikato,

EXPERIENCE:

Teaching, Extension and Research Appointments:

August 2011- , Professor, Forest, Rangeland and Fire Sciences Dept, University of Idaho

July 2006-August 2011, Professor, Forest Products Department, University of Idaho

December 2001-June 2006, Associate Professor, Forest Products Department, University of Idaho.

June 1998-November 2001, Project/Group Leader, Material Discovery, Forest Research.

September 1993-June 1998, Senior Scientist in Wood Materials Chemistry, New Zealand Forest Research Institute.

December 1985-August 1989, Scientist in Carbohydrate Chemistry, New Zealand Forest Research Institute.

TEACHING ACCOMPLISHMENTS:

Areas of Specialization:

Renewable materials chemistry

Carbohydrate chemistry & biochemistry

Wood science

Biopolymer and Biomaterials science

Natural products chemistry

Biomass conversion and biofuels

Courses Taught:

Wood Composites: FORP436/536 Spring 2002-2007, Fall 2007-2009
 Wood Composites: FORP502, Spring 2002
 Biocomposites: FORP436/536 Fall 2010, 2011, 2013; RMAT436/536 Fall 2014
 Wood Chemistry, FORP502, Fall 2002
 Wood Chemistry, FORP438/538, Fall 2003-2006, Spring 2007-2010
 Lignocellulosic Biomass Chemistry: FORP438/538 Spring 2011, 2013; RMAT 438/538 Spring 2014
 Biomaterials product and process development: FORP491, Spring 2005-2013; RMAT491 Spring 2014
 Biomass and Biorefinery BAE504, Fall 2006, Spring 2010
 Forest Products Issues and Technology FORP100, Fall 2006-2011
 Introduction to Renewable Materials Issues RMAT100, Fall 2013, 2014

Students Advised:

Secondary Student Internships:

Casey Cook, HOIST summer internship, 2004

Undergraduate Students:

David Zack, RMAT summer intern, University of Idaho, 2014
 Nikki Yates, ENVS senior project, University of Idaho, 2012
 Alan Kycek, Directed Studies, FORP, University of Idaho, 2011
 Brandon Higgins, Directed Studies, FORP, University of Idaho, 2010
 Jon Slette, Directed Studies, FORP, University of Idaho, 2010
 Justin Pattison, Directed Studies, FORP, University of Idaho, 2003
 Brent Jacobson, Directed studies, FORP, University of Idaho, 2003
 Stephanie Weal, 3rd and 4th year project, BscTech University of Waikato, New Zealand, 2001
 Cathy Risch, 4th year Bsc project, Ecole Normale Supérieure, France, 2001
 Brendan Lee, 3rd and 4th year project, BscTech, University of Waikato, New Zealand, 1997
 Greg Findleyson, 3rd year project, BscTech, University of Waikato, New Zealand, 1996
 Marc Fernandez, 4th year project, BSc, Victoria University, Canada, 1995

Graduate Students:

Currently advising-major professor:

Liqing Wei, Ph.D., Natural Resources, University of Idaho, 2011-
 Abdulbaset Alayat, Ph.D., Environmental Science, University of Idaho, 2013-

Advised to completion of degree-major professor:

Sang Yeob Lee, M.S., Forest Products, University of Idaho, December 2002
 Anand Mangalam, M.S., Forest Products, University of Idaho, 2002-05
 Smith Sundar, M.S., Forest Products, University of Idaho, 2003-05
 Andres Soria, Ph.D., Forest products, University of Idaho, 2002-05
 Carter Fox, M.S., Forest Products, University of Idaho, 2004-06
 Lance Gallagher, M.S., Forest Products, University of Idaho, 2003-06
 Karthik Pillai, M.S., Forest Products, University of Idaho, 2004-07
 James Fabiyi, Ph.D., Forest Products, University of Idaho, 2004-07
 Ayiguli Keyoumu, M.S., Forest Products, University of Idaho, 2005-07
 Lina Ma, M.S., Forest Products, University of Idaho, 2005-07
 Clay Dodson., M.S. Environmental Science, University of Idaho, 2006-08
 Shengjun Hu, M.S., Forest Products, University of Idaho, 2008-2010
 Janet Dai, M.S., Forest Products, University of Idaho, 2008-2010
 Noridah Osman, Ph.D., Forest Products, University of Idaho, 2005-2010
 Liqing Wei, M.S., Forest Products, University of Idaho, 2009-2011
 Guanqun Luo, M.S., Natural Resources, University of Idaho, 2010-12
 Jowita Laniak, Ph.D., Environmental Science, University of Idaho, 2007-2012
 Shaobo Liang Ph.D., Environmental Science, University of Idaho, 2010-2014
 Janet Dai, Ph.D., Natural Resources, University of Idaho, 2010-2014
 Hui Li, Ph.D., Natural Resources, University of Idaho, 2010-2014
 Yinglei Han, M.S., Natural Resources, University of Idaho, 2013-2014

Graduate Students (cont):

Served on graduate committee:

Adetayo Mustapha, Ph.D., Chemistry, University of Idaho, 2013-
Mohammadali Azadfar., Ph.D. Biosystems Eng, WSU, 2013-
Zheting Bi, Ph.D., Biological & Agricultural Eng., UI, 2013-
Nicholas Guho, Ph.D., Civil Engineering, University of Idaho, 2010-
Brian Harris, Ph.D., Chemistry, University of Idaho, 2005-
Daniel Howe, Ph.D., Civil Eng, WSU, 2007-
Odgerel Bumandalai, M.S. Biosystems Eng, WSU, 2013-2014 (completed)
Ryan Rehder, M.E., Civil Engineering, University of Idaho, 2011-2014 (completed)
Hesham Tantawy, Ph.D. Chemical Engineering, UI, 2010-2014 (completed)
Carl Morrow, Ph.D., Forest Products, University of Idaho, 2009-2013 (completed)
Hugo Araujo Lino., M.S., Chemistry, University of Idaho, 2012-2013 (completed)
Zhouhong Wang, Ph.D., Biosystems Eng, WSU, 2010-2013 (completed)
Chao-Feng Hsieh, Ph.D., Food Science, University of Idaho, 2009-2013 (completed)
Shaui Zhou, Ph.D., Biosystems Eng, WSU, 2010-2013 (completed)
Tushar Jain., Ph.D., Biological & Agricultural Eng., UI, 2009-2012 (completed)
Tova Sardot, Ph.D., Chemistry, University of Montana 2008-2012 (completed)
Christoph Schauwecker, Ph.D., Wood Sci. Eng, OSU, 2007-2011 (completed)
Keegan Duff., M.S., Biological & Agricultural Eng., UI, 2009-2011 (completed)
Wei Chen Yu, M.S., Food Science, University of Idaho, 2005-2010 (completed)
Robert Johnson, M.S., Biosystems Eng, WSU, 2007-2009 (completed)
Mackenzie Ellison, M.S., PSES, University of Idaho, 2008-2010 (completed)
Nicholas Guho, M.E., Civil Engineering, University of Idaho, 2009-2010 (completed)
Zachary Dobroth, M.E., Civil Engineering, University of Idaho, 2009-2010 (completed)
Isabela Reiniati, M.S., Material Science, WSU, 2007-2009 (completed)
Carl Morrow, M.S., Forest Products, University of Idaho, 2007-2009 (completed)
Joey Charboneau, M.S., Chemistry University of Idaho, 2007-2009 (completed)
Hyun-Seok Kim, Ph.D., Food Science, University of Idaho, 2005-2009 (completed)
Przemyslaw Brejna, Ph.D., Chemistry, University of Idaho, 2007-2010 (completed)
Nareh Pachauri, M.S., Bio & Agric. Eng., University of Idaho, 2005-2008 (completed)
Erica Rude, M.S., Materials Science, WSU, 2005-2007 (completed)
Sudip Chowdury, M.S., Civil Engineering, WSU, 2004-2006 (completed)
Ben LaFrentz, Ph.D. Fish & Wildlife, University of Idaho, 2004-2007 (completed)
Wei Lao, Ph.D. Biosystems Engineering, WSU 2004-2007 (completed)
Jinwu Wang, Ph.D., Civil Engineering, WSU, 2004-2007 (completed)
Carla Blengeri-Oyarce, M.S., Forest Products, UI, 2004-2006 (completed)
Jeremy Higley, M.S., Food Science, University of Idaho, 2003-05 (completed)
Cathy Hunt, M.S., Chemistry, University of Idaho, 2003-2005 (completed)
Holton Quinn, M.S, Chemical Engineering, University of Idaho, 2003-2007 (completed)
Leslie Ganus, M.S., Forest Products, University of Idaho, 2001-
Sharlene Peterson, Ph.D., Engineering, University of Auckland, 1998-2007 (completed)
Stephanie Weal, M.S., Engineering, Waikato University 2003-2006 (completed)
Erik Coats, Ph.D., Civil Engineering, WSU, 2002--05 (completed)
Ben Harlow, M.S., Forest Resource Management, UI, 2003-05 (completed)
Catherine Riddle, M.S., Chemistry, University of Idaho, 2002-04 (completed)
Kirk Kludt, M.E., Civil Engineering, WSU, 2001-03 (completed)
Jonathon Songster, M.S., Forest Products, University of Idaho, 2002-04 (completed)
Ralf Moeller, Ph.D., Biology, University of Auckland, 1998-2003 (completed)
Xiaowen Yuan, Ph.D., Engineering, University of Auckland, 1999-2003 (completed)
Brendan Lee, M.Sc., Chemistry, University of Waikato, 2000-03 (completed)
Ali Abdallah, M.Sc., Technology, University of Waikato, 2000-03 (completed)
Brian Harris, M.S., Chemistry, University of Idaho, Feb 2003 (completed)
Jason Brandt, M.S., Forest Products, University of Idaho, 2001-03 (completed)
Suzie Carnachan, Ph.D., Biology, University of Auckland, 1996-2000 (completed)

Courses Developed:

Wood composites FORP436/536
 Biocomposites RMA436/536
 Wood chemistry FORP438/538
 Lignocellulosic biomass chemistry RMA438/538
 Biomaterials product and process development RMA491
 Biomass and Biorefinery BAE504
 Introduction to Renewable Materials Issues "Design Project" RMA100

SCHOLARSHIP ACCOMPLISHMENTS:**Publications, Exhibitions, Performances, Recitals:****Refereed/Adjudicated (118):**

- Reiniati, I., Osman, N.B., McDonald, A.G., Laborie, M-P. (2015) Linear viscoelasticity of hot-pressed hybrid poplar relates to densification and to the in situ molecular parameters of cellulose. *Annals of Forest Science*. DOI: 10.1007/s13595-014-0421-1.
- Balogun, A.O., Lasode, O.A., Li, H., McDonald, A.G. (2015) Fourier transform infrared (FTIR) study and thermal decomposition kinetics of Sorghum bicolor glume and *Albizia pedicellaris* residues. *Waste and Biomass Valorization*. DOI: 10.1007/s12649-014-9318-3.
- Liang, S., Han, Y., Wei, L., McDonald, A.G. (2015) Production and characterization of bio-oil and bio-char from pyrolysis of potato peel wastes. *Biomass Conversion and Biorefinery*. DOI: 10.1007/s13399-014-0130-x.
- Liang, S., Gliniewicz, K., Mendes-Soares, H., Settles, M.L., Forney, L.J., Coats, E.R., McDonald, A.G. (2015) Comparative analysis of microbial community of novel lactic acid fermentation inoculated with different undefined mixed cultures. *Bioresource Technology*. 179, 268–274.
- Dai, J., Gliniewicz, K., Settles, M.L., Coats, E.R., McDonald, A.G. (2015) Influence of organic loading rate and solid retention time on polyhydroxybutyrate production from hybrid poplar hydrolysates using mixed microbial cultures. *Bioresource Technology*. 175: 23–33.
- Wei, L. and McDonald, A.G. (2015) Effect of peroxide induced cross-linking on structure and properties of two biopolyesters: poly(3-hydroxybutyrate) and poly(L-lactic Acid). *Journal of Applied Polymer Science*. 132(13): 4233-4247. DOI: 10.1002/app.41724
- Li, H., Sivasankarapillai, G., McDonald, A.G. (2015) Lignin valorization by forming toughened thermally-stimulated shape memory copolymeric elastomers: Evaluation of different industrial lignins. *Journal of Applied Polymer Science*. 132(5): 1505-1517. DOI: 10.1002/app.41389.
- Dai, J., McDonald, A.G., (2014) Production of fermentable sugars from hybrid poplar: Response surface model optimization of a hot-water pretreatment and subsequent enzymatic hydrolysis. *Biomass & Bioenergy*. 71: 275–284.
- Lasode, O.A., Balogun, A.O., McDonald, A.G. (2014) Investigation into isothermal heating of lignocellulosic biomass and their model constituents. *Journal of Sustainable Technology*. 5(1): 101-107.
- Liang, S., McDonald, A.G., Coats, E.R. (2014) Lactic acid production with undefined mixed culture fermentation of potato peel waste. *Waste Management*. 34(11): 2022-2027.
- Passero, M., Cragin, B., Hall, A.R., Staley, N., Coats, E.R., McDonald, A.G., Feris, K. (2014) Ultraviolet radiation pre-treatment modifies dairy wastewater, improving its utility as a medium for algal cultivation. *Algal Research*. 6: 98-110.
- Lasode, O.A., Balogun, A.O., McDonald, A.G. (2014) Torrefaction of some Nigerian lignocellulosic resources and decomposition kinetics. *Journal of Analytical and Applied Pyrolysis*. 109: 47-55.
- Pelaez-Samaniego, M.R., Yadama, V., Garcia-Perez, M., Lowell, E., McDonald, A.G. (2014) Effect of temperature during wood torrefaction on the formation of lignin liquid intermediates. *Journal of Analytical and Applied Pyrolysis*. 109: 222–233
- Abbas-Abadi, M.S., Haghghi, M.N., Yeganeh, H., McDonald, A.G., (2014) Evaluation of pyrolysis process parameters on polypropylene degradation products. *Journal of Analytical and Applied Pyrolysis*. 109: 272-277.
- Li, H., McDonald, A.G. (2014) Fractionation and characterization of industrial lignins. *Industrial Crops and Products*. 62: 67–76.

- Schauwecker, C.F., McDonald, A.G., Preston, A.F., Morrell, J.J. (2014) Use of iron oxides to influence the weathering characteristics of wood surfaces: A systematic survey of particle size, crystal shape and concentration. *European Journal of Wood & Wood Products*. 72(5): 669-680.
- Fabiyi, J.S., McDonald, A.G. (2014) Degradation of polypropylene in naturally and artificially weathered plastic matrix composites. *Maderas Ciencia y tecnología*. 16(3): 275-290.
- Li, H., Sivasankarapillai, G., McDonald, A.G. (2014) Lignin valorization by forming thermally-stimulated shape memory copolymeric elastomers - partially crystalline hyperbranched polymer as crosslinks. *Journal of Applied Polymer Science*. 131(22):12050-12060.
- Wei, L., Guho, N., Coats, E.R., McDonald, A.G., (2014) Characterization of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) biosynthesized by mixed microbial consortia fed fermented dairy manure. *Journal of Applied Polymer Science*. 131(11):5516-5528.
- Liang, S., McDonald, A.G. (2014) Chemical and thermal characterization of potato peel waste and its fermentation residue as potential resources for biofuel and bioproducts production. *Journal of Agricultural and Food Chemistry*. 62(33): 8421–8429.
- Balogun, A.O., Lasode, O.A., McDonald, A.G. (2014) Thermo-analytical and physico-chemical characterization of woody and non-woody biomass from an agro-ecological zone in Nigeria. *Bioresources*. 9(3): 5099-5113.
- Luo, G., Kengne, B-A.F., McIlroy, D.N., McDonald, A.G. (2014) A novel nano Fischer-Tropsch catalyst for the production of hydrocarbons. *Environmental Progress & Sustainable Energy*. 33(3): 693–698.
- Pohjanlehto, H., Setälä, H.M., Kiely, D.E., McDonald, A.G. (2014) Lignin-xylic acid-polyurethane based polymer network systems: preparation and characterization. *Journal of Applied Polymer Science*. 131(1):39714-39721.
- Zhou, S., Pecha, B., van Kuppevelt, M., McDonald, A.G., Garcia-Perez, M. (2014) Slow and fast pyrolysis of Douglas-fir lignin: Importance of liquid intermediates formation on products distribution. *Biomass & Bioenergy*. 66: 398–409.
- Wang, Z., Pecha, B., Westerhof, R., Kersten, S., Li, C-Z., McDonald, A.G., Garcia-Perez, M. (2014) Effect of cellulose crystallinity on solid/liquid phase reactions responsible for the formation of carbonaceous residues during slow pyrolysis. *Industrial & Engineering Chemistry Research*. 53(8): 2940–2955.
- Zhou, S., Garcia-Perez, M., Pecha, B., McDonald, A.G., Kersten, S. Westerhof, R. (2014) Effect of particle size on the composition of lignin derived oligomers obtained by fast pyrolysis of beech wood. *Fuel*. 125:15-19.
- Luo, G., McDonald, A.G. (2014) Conversion of methanol and glycerol into gasoline via ZSM-5 catalysis. *Energy & Fuels*. 28(1):600-606.
- Balogun, A.O., Lasode, O.A., McDonald, A.G. (2014) Devolatilisation kinetics and analytical pyrolysis gas chromatography/mass spectrometry (Py-GC/MS) of Nigerian teak (*Tectona grandis*). *Bioresource Technology*. 156:57-62.
- Mottern, D.L., Wagner, F.G., McDonald, A.G. (2013) Mitigation of brown stain in Ponderosa pine shop grade using high temperatures used early in kiln schedules. *Forest Products Journal*. 63(1/2):28-30.
- Zhou, S., Garcia-Perez, M., Pecha, B., Kersten, S., McDonald, A.G., Westerhof, R. (2013) Effect of fast pyrolysis temperature on the primary and secondary products of lignin. *Energy & Fuels*. 27(10): 5867–5877.
- Gallagher, L.W., McDonald, A.G., (2013) The effect of micron sized wood fibers in wood plastic composites. *Maderas Ciencia y tecnología*. 15(3): 357-374.
- Mamiński, M.L., Król, M., McDonald, A.G., McIlroy, D.N., Niraula, I.B., Czechowska, J., Parzuchowski, P. (2013) Thermally-initiated solvent-free radical modification of beech (*Fagus sylvatica*) wood. *Journal of Wood Science & Technology*. 47(5): 1019-1031.
- Coats, E.R., Searcy, E., Feris, K., Shrestha, D., McDonald, A.G., Briones, A., Magnuson, T., Prior, M. (2013) An integrated two-stage anaerobic digestion and biofuel production process to reduce life cycle GHG emissions from U.S. dairies. *Biofuels, Bioproducts & Biorefining*. 7(4):459-473.
- Chakraborty, M., McDonald, A.G., Nindo, C., Chen, S. (2013) Physicochemical characterization of an α -glucan from *Chlorella sorokiniana* isolated as a co-product of biooil extracted using a unique two-step hydrothermal technology. *Algal Research*. 2(3): 230–236.
- Titiladunayo, I.F., Fapetu, O.P., and McDonald, A.G. (2013) Development of a fixed-bed pyrolysis reactor from local materials for thermochemical conversion of lignocellulosic biomass. *Journal of Biobased Materials & Bioenergy*. 7(3): 336-347.

- Wei, L., McDonald, A.G., Freitag, C., Morrell, J.J. (2013) Effects of wood fiber esterification on properties, weatherability and biodurability of wood plastic composites. *Polymer Degradation & Stability*. 98: 1348-1361.
- Osman, N.B., McDonald, A.G., Laborie, M-P.G. (2013) Characterization of water-soluble extracts from hot-pressed poplar. *European Journal of Wood & Wood Products*. 71(3): 343-351.
- Sahaf, A., Laborie, M-P.G., Englund, K., Garcia-Perez, M., McDonald, A.G., (2013) Rheological properties and tunable thermoplasticity of phenolic rich fraction of pyrolysis bio-oil. *Biomacromolecules*. 14(4): 1132–1139.
- Hu, S., McDonald, A.G., Coats, E.R. (2013) Characterization of polyhydroxybutyrate (PHB) biosynthesized from crude glycerol waste using mixed microbial consortia. *Journal of Applied Polymer Science*. 129: 1314-1321.
- Zhou, S., Garcia-Perez, M., Pecha, B., McDonald, A.G., Kersten, S., Westerhof, R. (2013) Secondary vapor phase reactions of lignin derived oligomers obtained by the fast pyrolysis of pine wood. *Energy & Fuels*. 27(3): 1428-1438.
- Sardot, T., McDonald, A.G. and Smith, G. (2013) Characterization of a cardboard recycling facility's mixed plastic waste for beneficial use. *Waste & Biomass Valorization*. 4(1): 161-171.
- Fabiyi, J.S., McDonald, A.G. (2013) Weathering performance of delignified pine-based polyvinylchloride composites. *Journal of Reinforced Plastics & Composites*. 32(8): 44-60.
- Schauwecker, C., McDonald, A.G., Morrell, J.J. (2013) Performance of wood treated with prospective surface protectants on outdoor exposure: FTIR spectroscopic analysis of weathered surfaces. *Holzforschung*. 67(2): 227-235.
- Wang, Z., McDonald, A.G., Westerhof, R.J.M., Kersten, S.R.A., Cuba-Torres, C.M., Ha, S., Pecha, B Garcia-Pereza, M. (2013) Effect of cellulose crystallinity on the formation of a liquid intermediate and on product distribution during pyrolysis. *Journal of Analytical & Applied Pyrolysis*. 100: 56-66.
- Zhou, S., Osman, N.B., Li, H., McDonald, A.G., Mourant, D., Li, C-Z., Garcia-Perez, M. (2013) Effect of sulfuric acid addition on the yield and composition of lignin derived oligomers obtained by the Auger and fast pyrolysis of Douglas-fir wood. *Fuel*. 103: 512-523.
- Dai, J., McDonald, A.G. (2013) Response surface optimization of hot water pretreatment for enzymatic hydrolysis of hybrid poplar – first step of bioconversion of woody biomass to value added bioplastics. In: Pretreatment techniques for biofuels and biorefineries, Editor - Zhen Fang, Springer-Verlag, Springer Asia Limited Beijing. pp 183-195, ISBN 978-3-642-32734-6.
- Osman, N.B., McDonald, A.G., Laborie, M-P.G. (2012) Analysis of DCM extractable components from hot-pressed hybrid poplar. *Holzforschung*. 66(8):927–934.
- Sivasankarapillai, G., McDonald, A.G., and Li, H. (2012) Lignin valorization by forming toughened lignin-co-polymers: Development of hyperbranched prepolymers for cross-linking. *Biomass & Bioenergy*. 47: 99-108.
- Sardot, T., McDonald, A.G. and Smith, G. (2012). Valorizing Mixed Plastic Waste from Cardboard Recycling by Amendment with MAPE, Wood, Cement and Ash. *Journal of Reinforced Plastics & Composites*. 31(21): 1488–1497.
- Soria, A.J. and McDonald, A.G. (2012) Liquefaction of softwoods and hardwoods in supercritical methanol: a novel approach to bio-oil production. In: "Biomass Conversion: The interface of biotechnology, chemistry and materials science". Eds. Baskar, C., Baskar, S., and Dhillon, R.S. Springer-Verlag, Berlin. Pp 421-433. DOI: 10.1007/978-3-642-28418-2_13
- Titiladunayo, I.F., McDonald, A.G., and Fapetu, O.P. (2012) Effect of temperature on biochar product yield from selected lignocellulosic biomass in a pyrolysis process. *Waste & Biomass Valorization*. 3(2)311-318.
- Dziedzic, J.A. and McDonald, A.G. (2012) A comparative survey of proteins from recalcitrant tissues of a non-model gymnosperm, Douglas-fir. *Electrophoresis*. 33(7):1102-1112.
- Chakraborty, M., Miao, C., McDonald, A., and Chen, S. (2012) Concomitant extraction of bio-oil and value added polysaccharides from *Chlorella sorokiniana* using a unique sequential hydrothermal extraction technology. *Fuel*. 95:63-70.
- Adefisan, O.O., Fabiyi, J.S. and McDonald, A.G. (2012) Hydration behaviour and infrared spectroscopy of pre-treatments effect on Portland cement-*Eremospatha macrocarpa* and *Laccosperma secundiflorum* systems. *Journal of Applied Science*. 12(3):254-262.
- McDonald, A.G. and Ma, L. (2012) Plastic moldable lignin. In: "Lignin: properties and applications in biotechnology and bioenergy". Ed. Paterson R.J., Nova Science Publishers, Inc. Chapter 19. pp. 489-498.

- Pillai, K.V., McDonald, A.G., and Wagner, F.G. (2011) Developing a model system in vitro to understand tracheary element development in Douglas-fir (pseudotsuga menziesii). *Maderas. Ciencia y tecnología* 13(1): 3-18.
- Fabiyi, J.S., McDonald, A.G., Morrell, J.J., and Freitag, C. (2011) Structural characterization of wood species on biodegradation of wood plastic composites. *Composites part A*. 42:501-510.
- Dobroth, Z.T., Hu, S., Coats, E.R., McDonald, A.G. (2011) Polyhydroxybutyrate synthesis on biodiesel wastewater using mixed microbial consortia. *Bioresource Technology*, 102:3352-3359.
- Sivasankarapillai, G., McDonald, A.G. (2011) Synthesis and properties of lignin-highly branched poly(ester-amine) polymeric systems, *Biomass & Bioenergy*, 35:919-931.
- McDonald, A.G., and Ma, L. (2010) Plastic moldable pine fiber by benzylation. In: Wood: Types, Properties, and Uses. Ed. Botannini, L.F., Nova Science Publishers, Inc. pp181-192.
- Jain, T., Van Gerpen, J., McDonald, A.G. (2010) Production of fuel ethanol from woody biomass. *Journal of Biofuels*.1(1):109-114.
- Fabiyi, J.S., McDonald, A.G., (2010) Physical morphology and quantitative characterization of chemical changes of weathered PVC/pine composites. *Journal of Polymers in the Environment*. 18:57-64.
- Fabiyi, J.S., McDonald, A.G., (2010) Effect of wood species on property and weathering performance of wood plastic composites. *Composites Part A*. 41:1434-1440.
- Fox, S.C., McDonald, A.G. (2010) Chemical and thermal characterization of three industrial lignins and their corresponding lignin esters. *BioResources*. 5(2):990-1009.
- Candan, Z., Hiziroglu, S., McDonald, A.G., (2010) Surface quality of thermally compressed Douglas fir veneer. *Materials & Design*. (31)7: 3574-3577.
- Johnson R.L., Liaw, S-S, Garcia-Perez, M., Ha, S., Lin, S.S-Y, McDonald, A.G., Chen, S. (2009) Pyrolysis-GC/MS studies to evaluate high temperature aqueous pretreatment as a way to enhance the quality of bio-oil from fast pyrolysis of wheat straw. *Energy & Fuels*. 23(12):6242-6252.
- Fabiyi, J.S., McDonald, A.G., (2009) Pyrolysis gas chromatography-mass spectrometry study of weathered wood plastic composites. In: Handbook on Mass Spectrometry Instrumentation, Ed. J. K. Lang, Nova Science Publishers, Inc. Chp 19.pp 447-458.
- Fabiyi, J.S., McDonald, A.G., McIlroy, D. (2009) Wood modification effects on weathering of HDPE-based wood plastic composites. *Journal of Polymers in the Environment*. 17:34-48.
- Wagner, F.G., Smith, N.R., McDonald A.G., (2008) Initial high-temperature schedule to reduce drying time and control kiln brown stain in ponderosa pine shop lumber. *Forest Products Journal*. 58(12):29-32.
- Soria, A.J., McDonald, A.G., Shook, S.J. (2008) Wood solubilization and depolymerization using supercritical methanol. Part 1: Process optimization and analysis of methanol insoluble components (bio-char) *Holzforschung*. 62: 402-408.
- Soria, A.J., McDonald, A.G., He, B.B. (2008) Wood solubilization and depolymerization by supercritical methanol. Part 2: Analysis of methanol soluble compounds. *Holzforschung*. 62: 409-416.
- Fabiyi, J.S., McDonald, A.G., Wolcott, M.P., Griffith, P.R. (2008) Wood plastic composites weathering: Visual appearance and chemical change. *Polymer Degradation & Stability*. 93:1405-1414.
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Grants and Contracts Awarded:

- Williams, R., Hrdlicka, P.J., Magolan, J., Shreeve, J.M., Baker, L.L., Strawn, D., Cheng, I.F., McDonald, A.G., Roll, M.F. Acquisition of a 500 MHz Nuclear Magnetic Resonance Spectrometer. M.J. Murdock Charitable Trust. 01/2015-12/2015, \$395,690.
- McDonald, A.G. Coleman, M., Brooks, R. Washington DNR Pyrolysis Project. Washington State DNR, 4/14-12/14, \$18,261.
- McDonald, A.G. and McIlroy, D. Upgrading biomass pyrolysis bio-oil to renewable fuels. NIATT-DOT-TransLIVE, 9/13-8/14, \$55,000.
- McDonald, A.G. Waters Academic Grant program, 10/12-6/13. \$12,000.
- Searcy, E., Coats, E., Feris, K., McDonald, A.G., Newby, D. Integrated Approach to Algal Biofuel, Bio-power, and Agricultural Waste Management. INL-LDRD, 10/12-9/15, \$600,000.
- McDonald, A.G. and McIlroy, D. Pyrolysis bio-oil upgrading to renewable fuels. NIATT-DOT, 9/12-8/13, \$82,000.
- Feris, K., Coats, E., McDonald, A.G., Guillen, D.P., Hamilton, M. Enhancing greenhouse gas mitigation and economic viability of manure management systems via production of value added carbon sequestering bio-products and soil amendments. USDA-NIFA. 9/12-8/15, \$650,000.
- Huber, K., McDonald, A.G., Kim, J-Y. Contrast of Russet Burbank and Premier Russet Potato Tissue and Starch Characteristics. J.R. Simplot Company. Jan 2012-Dec 2012, \$24,732.
- Sablani, S., Bohlscheid, J., Nindo, C., Huber, K., and McDonald, A.G., Vapor Sorption Analyzer Equipment Grant - Decagon Devices, Pullman, WA.
- McDonald, A.G. and McIlroy, D. Development of nanocatalysts for the synthesis of biofuels from biomass derived syngas. NIATT-DOT, 9/11-8/12, \$104,603.

- Coats, E. and McDonald, A.G., Constructing a Pilot-scale Bioplastic Production Facility. Idaho SBOE. March 2011 – Dec 2011, \$50,000.
- McDonald, A.G., Coats, E., Huber, K. Converting Potato Peel Waste to Bioproducts. J.R. Simplot Company. Jan 2011-Dec 2012, \$150,725.
- Searcy, E., Briones, A., Coats, E., Feris, K., Keiser, D., Magnuson, T., McDonald, A., Shresth, D. Design and Operational Improvements, and LCA in Anaerobic Digestion of Fermented Dairy Manure Using a 2-Stage process. INL-LDRD, April 2010-Dec 2012, \$592,000.
- Gorman T.M., McDonald A.G., Bender, D., and Morgan, T. Inland Northwest Forest Products Consortium USDA-CSREES, July 2010-June 2013, \$504,000.
- Garcia-Perez M., McDonald A.G and Elliott D. Understanding Cellulose Primary Thermo-chemical Reactions to Enhance the Yields of Anhydro-saccharides Resulting from Fast Pyrolysis. NSF, Jan 2010-Dec 2012, \$298,863.
- Coats, E. and McDonald, A.G., Toward Commodity Biopolymer Production from Dairy Manure. Idaho Dairyman's Assoc. Jan 2010 – Dec 2011, \$102,300.
- McDonald A.G. and Soria A.J. Bio-oils from high lignin feedstocks Inland Northwest Forest Products Consortium USDA-CSREES, July 2009-June 2011, \$36,310.
- McDonald A.G. and Morrell, J. Durable Wood plastic composites. Inland Northwest Forest Products Consortium USDA-CSREES, July 2009-June 2011, \$54,200.
- Wagner F. and McDonald A.G. Energy Consumption at Commercial Dry Kilns. Inland Northwest Forest Products Consortium USDA-CSREES, July 2009-June 2011, \$47,409.
- Gorman T.M. and A.G. McDonald. Sustainable building materials from at-risk intermountain species. USDA-Forest Products Laboratory, June 2009-May 2014, \$100,000.
- Coats, E., McDonald, A.G., Makus, L. An Interdisciplinary Research Program Advancing Commercial Processes for Converting Organic Waste to Chemical Commodities, UI-FIT, Jun 2009-July 2010, \$10,000.
- McDonald A.G. and Laborie M-P. The Chemistry of Hot Pressing. Inland Northwest Forest Products Consortium USDA-CSREES, July 2008-June 2010, \$44,200.
- McDonald A.G. and Soria A.J. Biofuels Development and Evaluation. Inland Northwest Forest Products Consortium USDA-CSREES, July 2008-June 2010, \$37,800.
- Wagner F. and McDonald A.G. A Lumber Quality and Kiln-Time Implications of High-Temperature Kiln Schedules and Restraint on Inland Northwest Species. Inland Northwest Forest Products Consortium USDA-CSREES, July 2008-June 2010, \$44,000.
- Coats E and McDonald A.G. Development of a Bio-based Industry Utilizing Municipally-derived Organic Waste: Production of Biological Thermoplastics. Idaho SBOE-HERC, Jan 2008-July 2009, \$75,000.
- Gorman T.M. and A.G. McDonald. Chemical, physical and mechanical properties of at-risk intermountain species. USDA-Forest Products Laboratory, Aug 2008-Aug 2013, \$50,000.
- Gorman T.M. and A.G. McDonald. Assessing wood quality characteristics of the Intermountain Forest Resource. USDA-Forest Products Laboratory, Aug 2007-Aug 2012, \$130,000.
- McDonald A.G., Wagner F. and Paszczynski A. A Proteomic Study of Wood Formation in Douglas-fir using an In-vitro Model System. Stillinger Forestry Research Grant, July 2007-June 2008, \$24,000.
- Coats E and McDonald A.G. Development of a Bio-based Industry Utilizing Organic Waste Streams (Confined Animal Feedlot and Biodiesel co-Products): Production of Biological Thermoplastics and Natural Fiber-Plastic Composites (NFPCs). Sun Grant Initiative, July 2007-June 2009, \$254,916.
- Aston, D.E, McDonald, A.G, McIlroy, D, Griffiths, P, and Laborie, M-P. MRI: Acquisition of Confocal Raman, Scanning Near-Field Optical Microscopy (SNOM) System for Wet and Dry Materials and Device Engineering. NSF-MRI, Sept2006-Aug2007, 527,000.
- Gorman T.M. Shook, S, Nalle, D and A.G. McDonald. Log merchandising and wood quality enhancements. Inland Northwest Forest Products Consortium USDA-CSREES, July 2006-June 2008, \$381,672.
- Gorman T.M. and A.G. McDonald. Property evaluation of the at risk timber resource of the intermountain west. USDA-Forest Products Laboratory, July2006-June2010, \$91,000.
- McDonald A.G. and McIlroy, D. Surface modification of wood by UV Laser excitation. Inland Northwest Forest Products Consortium USDA-CSREES, July 2006-June 2008, \$77,697.
- He, B. Huber, K, Yukslell, G, Chen, S, and McDonald A.G. Curriculum development: biorefinery process analysis and design. USDA-CSREES, Oct 2004-Sept 2007, \$284,009.

- McDonald A.G. and Gorman T.M. Hardening and dimensionally stabilizing wood. Inland Northwest Forest Products Consortium USDA-CSREES, July 2005-June 2007, \$27,540.
- McDonald A.G.. Plasticization of Wood. Inland Northwest Forest Products Consortium USDA-CSREES, July 2005-June 2007, \$82,080.
- Paszczynski, A.P., et al., Proteomics Research Discovery Core Facility, Murdock Charitable Trust Equipment Grant, February 2005, \$419,000.
- McDonald A.G. et al., Extrusion Capabilities for Materials & Food Research in the Inland Northwest Murdock Charitable Trust Equipment Grant, February 2005, \$235,500.
- McDonald A.G. and K. Launchbaugh. Carbohydrate Analysis for Bioproducts Research. USDA-CREES-NRI program., equipment grant # 2005-35504-16083, 2005, \$24,750.
- McDonald, A.G. and B. He. FTIR Spectroscopy for Wood and Bioproducts Research. USDA-CSREES-NRI equipment grant #2004-03713 August 2004, \$24,006.
- Laborie, M-P and A.G. McDonald. Physico-chemical aspects of hybrid poplar hot-pressing. USDA-CSREES-NRI grant #2004-3565, August 2004, \$204,801.
- McDonald, A.G., and M.P. Laborie. Thermoplastics derived from lignin. Inland Northwest Forest Products Consortium USDA-CSREES, July 2004-June 2006, \$64,720.
- McDonald, A.G. and E. Aston. EPSCOR Instrument Grant, University of Idaho, Research Office, February 2004, \$10,000.
- McDonald, A.G., F. Wagner, D. Winney, and C. Anderson. Understanding Xylem Development in Conifers by In-vitro Studies. USDA-McIntire-Stennis, \$62,360, March 2004-March 2006.
- McDonald, A.G. and M.P. Wolcott. Improved formulations and/or product design for weatherability and prototype siding and trim components. Office of Naval Research Grant # N00014-03-1-0949, September 2003-05, \$111,472.
- McDonald, A.G., T. Gorman, and D. Bender. Rapidly Screening the Forest Resource for Wood Quality. Inland Northwest Forest Products Consortium USDA-CSREES, September 2003-05, \$71,589.
- Laborie M-P, and A.G. McDonald. "Pyrolysis-based Novolacs for Wood-Based Composites" USDA-CREES, Inland Northwest Forest Products Consortium, September 2003-05, \$49,891.
- McDonald, A.G., K. Huber, and P. Singh. Equipment Funds for Small Laboratory Molder. EPSCOR equipment grant, University of Idaho, Research office, August 2003, \$5,500.
- McDonald A.G., and K. Cain. Structural and Functional Characterization of an Immunoprotective Lipopolysaccharide (LPS) Component of the Fish Pathogen *Flavobacterium psychrophilum*. Seed Grant, EPSCOR-University of Idaho, April 2003, \$9,000.
- McDonald, A.G. Small Travel Grant, Research Office, University of Idaho, April 2003, \$900
- Huber, K., A.G. McDonald and P. Singh. Simultaneous microstructural and calorimetric characterization of foods and biomaterials using thermal microscopy. USDA-CREES-NRI equipment grant program (2003-35503-13697), October 2002, \$25,000.
- McDonald, A.G. Micro-woodfiber composites. USDA-CREES-NRI program: Improved Utilization of Wood and Woodfiber, 73.0, December 2002-November 2004, \$170,000.
- Huber, K., A.G. McDonald, and R. vonWandruska. EPSCOR instrument grant, University of Idaho, Research office, August 2002, \$15,500.
- McDonald, A.G., T.M. Gorman, and M.P. Wolcott. Property enhancements of wood and wood based products from small diameter logs by an electro-heating treatment. Inland Northwest Forest Products Consortium USDA-CSREES, July 2002-June 2003, \$64,519.
- McDonald, A.G. Small Travel Grant, Research Office, University of Idaho, April 2002, \$900.
- McDonald, A.G. EPSCOR equipment grant, University of Idaho, Research office, January 2002, \$30,000.

Grants and Contracts Pending:

- McDonald, A.G., Stark, N. Bioplastic-grafted-nanocellulose biocomposite materials. U.S. Endowment for Forestry and Communities and USDA Forest Service (USFS) public private partnership (P3Nano). 1/2015-12/2017, \$348,475.
- McDonald, A.G., Garcia-Perez, M., Englund, K., Puettmann M. USDA-Critical Agricultural Materials. Biobased hot-melt adhesives. 1/2015-12/2016, \$ 575,087.
- Cook, S., McDonald, A.G., Coleman, M., Page-Dumroese, D., Schotzko, K.G. Impacts of nutrient availability on susceptibility and suitability of whitebark pine to mountain pine beetle. USDA-NIFA, 01/2015-12/2017, \$499,999.

- Mulbery, J., Roll, M., Williams, C., McDonald, A.G. Plug N'Play Modules for Analysis, Design of Experiments, and Measurement (ADEM) Education. NIST, 01/2015-12/2015, \$74,800.
- McDonald, A.G., Coats, E.R., Toward commercial production of lactic acid from potato peel waste. USDA-AFRI, 11/2014-10/2017, \$499,999.
- Coats, E.R., McDonald, A.G., Advancing Materials Processing, Structure, and Properties Fundamentals for Polyhydroxyalkanoates Synthesized from Waste Organic Matter. NSF, 08/2014-8/2017, \$ 393,889.
- Corti, G., McIlroy, D., McDonald, A.G. Nanosprings interlayer to enhance the interlaminar strength of fiber-metal and laminated composite materials. NSF, 01/2015-12/2017, \$578,196.
- Prior, M., Feris, K., McDonald, A.G., Ultraviolet radiation pre-treatment modified dairy wastewater, improving its utility as a medium for algal cultivation. USDA-SBIR phase I, 06/2015-02/2016, \$100,000.
- McDonald, A.G., McIlroy, D., Nanospring Networks As Supports for Fischer-Tropsch Catalysts. NSF, 05/2015-4/2018, \$ 329,739.
- McIlroy, D., McDonald, A.G. Solar cracking of water using advanced hybrid catalytic materials. NSF, 05/2015-04/2018, \$482,398.
- McDonald, A.G. Foamed cellulose-nanocrystals/polyhydroxybutyrate-co-valerate packaging materials. USDA-NIFA. 05/2015-04/2016, \$99,998.
- McDonald, A.G., McIlroy, D., Toughening composite materials with nanosprings for improved safety of transportation infrastructures and vehicles. NIATT, 01/2015-06/2016, \$60,000.

Honors and Awards:

NZ-FRI Achievement in Science Award for Inter-disciplinary Science, April 1997

SERVICE:

Major Committee Assignments:

- Served on the search committee for the Assistant Professor position in Conservation Social Science Department, UI 2014-
- Served on the search committee for Associate Contract Review Officer, UI, 2013
- Served on the search committee for the Polymer Scientist position in the Material Science and Chemical Engineering Department, UI, 2011
- Served on the search committee for the Polymer Scientist position in the Material Science and Engineering Department, UI, 2007
- Served on the search committee for the Polymer Scientist position in the Material Science and Engineering Department, UI, 2003
- Served on the two search committees for the Biomaterials position in the Wood Materials and engineering Laboratory, WSU, 2002, 2003
- Chair for the CNR committee of committees, 2002-04
- Committee member for the UI Safety and Loss committee, 2003-2009
- Committee member for the CNR Safety committee, 2005-present
- Committee member for the CNR Space committee, 2008-present
- Committee member for the CNR Graduate student scholarship committee, 2009-present
- Committee member for CNR Curriculum committee, 2013-present
- Committee member for CNR Promotion and tenure committee, 2013-present

Professional and Scholarly Organizations:

- Australian Pulp and Paper Institute Technical Association (APPITA), member, 1993-2010.
- Forest Products Society, Member, 2002-present
- Society of Wood Science and Technology, Member, 2002-present
- American Chemical Society, Member, 2010-present
- International Association of Wood Scientists (IAWS), Elected Fellow, 2013-present

Honors and Awards:

Carter Holt Harvey-New Ventures Ideas to Business Entrepreneur Awards 2001: Oct 2001.