

Matyas Kosa

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Objective:

A prospective Ph.D. in chemistry is interested in working on biofuel, biomaterial and paper science related problems.

Education

Georgia Institute of Technology (GT)

Expected Graduation: December 2011

Ph.D. in Chemistry

Current GPA: 3.80/4.00

Budapest University of Technology and Economics (BME)

Graduation: February 2007

University Diploma (equal to M.Sc.) in

Bioengineering, Final GPA: 4.47/5.00

Research Experience

Graduate Research Assistantship, (GT)

August 2007 - present

Evaluating lignin utilization; including biomass characterization and pretreatment/lignin degradation experiments (e.g. pyrolysis).

LignoBoost lignin characterization, pyrolysis and bioconversion, to enhance the Kraft-cycle by lowering input streams to the recovery boiler, while also valorizing the process by the addition of a valuable side-product.

Lignin bioconversion: microbe selection and fermentation, as well as metabolic pathway mapping and process optimization with Gram-positive *Rhodococci*.

Graduate Researcher (BME)

February 2006 - February 2007

Genetic engineering research: focusing on DNA manipulation and transformation creating heterologous *P. pastoris* yeast and *E. coli* bacterium strains, as well as gene expression from the recombinant strains and protein analysis.

Teaching Experience

BME – Microbial Genetics class

September-December 2006

Teaching assistant

Industrial Experience

Internship at Alpharma Hungary Ltd

August 2005

Antibiotic drug production –downstream processing- engineering assistant

Internship at Coca-Cola Hellenic

July - August 2004

Quality control assistant in technology and later in microbiology labs

Laboratory Skills

- Bacteria and yeast cultivation and selection, DNA manipulation and transformation, protein expression and activity assays
- Analytical spectroscopy (strong knowledge of NMR techniques and spectrum analysis, FT-IR and UV-VIS), chromatography (strong knowledge of GC-MS, HPLC and GPC)
- Paper testing, deep knowledge of pulping and bleaching chemistry

- Basic knowledge/use of fermentation modeling, optimization and bioinformatics
- Accentuated interest in statistics (experimental design)

Publications

1. M. Kosa and A. J. Ragauskas, Lipids from heterotrophic microbes: advances in metabolism research. *Trends in Biotechnology* 29: 53-61, **2011**
 2. K. David, M. Kosa, A. Williams, R. Mayor, M. Reaff, J. Muzzy and A. J. Ragauskas, ³¹P-NMR analysis of bio-oils obtained from the pyrolysis of biomass. *Biofuels* 1: 839-845, **2010**
 3. M. Nagy*, M. Kosa*, H. Theliander and A. J. Ragauskas, Characterization of CO₂ precipitated Kraft lignin to promote its utilization. *Green Chemistry* 12: 31-34, **2010**
 4. M. Kosa, Sustainability in wood-using sectors: a student perspective. *Tappi Journal* 8: 3, **2009**
1. COVER art for the issue, in March Top 5th most downloaded article
 3. * equal contribution, COVER art for the issue, within Top 10 most accessed articles in 02/2010
 Further papers are submitted or in preparation.

Presentations

- M. Kosa, Characterization of LignoBoost lignin to predict possible utilization, Performance for Innovation/CIBER Exchange program, Portugal **2009**
- M. Nagy, M. Kosa, H. Theliander and A. J. Ragauskas, New energy: Fuel resources from kraft pulping. Abstracts of Papers, 237th ACS National Meeting CELL-191, Salt Lake City, UT, United States, March **2009**

Advisors, contacts

- **Prof. Arthur J. Ragauskas** (GT, Institute of Paper Science and Technology)
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(www.ipst.gatech.edu/faculty/ragauskas_art/bio_ragauskas_art.html)
- **Prof. Katalin Réczey** (BME, Dept. of Applied Biotechnology and Food Science)
E-mail: kati_reczey@mkt.bme.hu; phone: +36-1-463-2843 (www.nonfood.bme.hu)
- **Prof. András Holczinger**, (BME)

Language

English and Hungarian