

## Y.-H. Percival Zhang, Ph.D.

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### I. EDUCATION AND TRAINING

|                               |                                    |                    |
|-------------------------------|------------------------------------|--------------------|
| East China U Sci Tech (ECUST) | Biochemical Engineering            | B.E., 1993         |
| ECUST                         | Biochemical Engineering            | M.S., 1996         |
| Dartmouth College             | Chemical & Biochemical Engineering | Ph.D., 2002        |
| Dartmouth College             | Chemical & Biochemical Engineering | Postdoc, 2002-2004 |

### II. RESEARCH AND PROFESSIONAL EXPERIENCE

|                |  |
|----------------|--|
| 4/2010-present | Associate Professor, Biological Systems Engineering, Virginia Tech |
| 8/2005-4/2010  | Assistant Professor, Biological Systems Engineering, Virginia Tech |
| 9/2007-present | Affiliated Investigator, DOE Bio Energy Science Center (BESC)      |
| 5/2004-7/2005  | Research Scientist, Dartmouth College                              |

### III. SELECTED AWARDS

|      |  |
|------|--|
| 2011 | Dean's Fellow (College of Engineering, Virginia Tech)  |
| 2010 | Biotechnology and Bioengineering Daniel IC Wang Award (Wiley and ACS BIOT)                         |
| 2009 | ASABE Sunkist Young Designer Award (ASABE)   |
| 2008 | British Petroleum Young Scientists Award (IBS2008)   |
| 2008 | DuPont Young Professor Award   |
| 2008 | Outstanding New Faculty Award of the College of Engineering of Virginia Tech                       |
| 2008 | Young Investigator Award of Air Force Office of Scientific Research (AFOSR)                        |
| 2006 | ACS PRF New Faculty Award  |
| 2006 | Best and Brightest (Science and Technology) of Esquire   |
| 2006 | Ralph E. Powe Junior Faculty Enhancement Award   |
| 2004 | 1 <sup>st</sup> Class Award for Advancement of Science & Technology (Ministry of Education, China) |
| 1993 | Honor degree of ECUST undergraduate  |

### IV. KEY ACHIEVEMENTS AND INNOVATIONS

- Implemented the production of 12 H<sub>2</sub> from per glucose unit and water and generated hydrogen energy from waste heat (without temperature gradient)
- Proposed cell-free synthetic pathway biotransformation (SyPaB) as cascade enzyme factories
- Enzymatic conversion of cellulose to starch
- Invented biomass-independent cellulose solvent- and organic solvent-based lignocellulose fractionation (COSLIF)
- Validated the feasibility of consolidated bioprocessing (CBP) for lowest-cost cellulosic ethanol production

### V. PUBLICATIONS (90+ peer-reviewed journal publications and book chapters, and 18 patent disclosures). > 2,000 ISI citations, H-index = 23)

- **Zhang Y-HP\***. 2011. What is vital (and not vital) to advance economically-competitive biofuels production. *Process Biochemistry* 46: 2091-2110 (**Invited opinion review**).
- **Zhang Y-HP\***, Myung S, You C, Zhu ZG, Rollin J. 2011. Toward low-cost biomanufacturing through cell-free synthetic biology: bottom-up design. *Journal of Materials Chemistry* 21: 18877-18886.
- **Zhang Y-HP\***. 2011. Substrate channeling and enzyme complexes for biotechnological applications. *Biotechnology Advances* 29: 715-725.

- **Zhang Y-HP\***. 2011. Simpler is better: high-yield and potential low-cost biofuels production through cell-free synthetic pathway biotransformation (SyPaB). *ACS Catalysis* 1: 998-1009 (**Invited perspective**).
- Zhu ZG, Wang YR, Minter SD, **Zhang Y-HP**. 2011. Maltodextrin-powered enzymatic fuel cell through a non-natural enzymatic pathway. *Journal of Power Sources* 196:7505-7509.
- Wang YR, Huang WD, Sathisuksanoh N, Zhu ZG, **Zhang Y-HP\***. 2011. Biohydrogenation from biomass sugar mediated by cell-free synthetic pathway biotransformation. *Chemistry and Biology* 18: 372-380 (**Featured article**).
- Huang WD, **Zhang Y-HP\***. 2011. Analysis of biofuels production from sugar based on three criteria: Thermodynamics, bioenergetics, and product separation. *Energy and Environmental Science* 4:784-792.
- Rollin J, Zhu ZG, Sathisuksanoh N, **Zhang Y-HP\***. 2011. Increasing substrate accessibility is more important than removing lignin: A comparison of cellulose solvent-based lignocellulose fractionation and soaking in aqueous ammonia. *Biotechnology and Bioengineering* 108: 22-30. (#1 cited paper in 2011)
- **Zhang Y-HP\***, Sun J-B, Zhong J-J. 2010. Biofuels production by *in vitro* synthetic pathway transformation. *Current Opinion in Biotechnology* 23: 663-669.
- Ye X, Wang Y, Hopkins RC, Adams MWW, Evans BR, Mielenz JR, **Zhang Y-HP\***. 2009. Spontaneous high-yield production of hydrogen from cellulosic materials and water catalyzed by enzyme cocktails. *ChemSusChem* 2: 149-152.
- **Zhang Y-HP\***. 2009. A sweet out-of-the-box solution to the hydrogen economy: Is sugar-powered car science fiction? *Energy and Environmental Science* 2: 272-282.
- Hong J, Wang Y, Ye X, **Zhang Y-HP\***. 2008. Simple protein purification through affinity adsorption on regenerated amorphous cellulose followed by intein self-cleavage. *Journal of Chromatography A* 1194(2): 150-154.
- Hong J, Ye X, **Zhang Y-HP\***. 2007. Quantitative determination of cellulose accessibility to cellulase based on adsorption of a non-hydrolytic fusion protein containing CBM and GFP with its applications. *Langmuir* 23 (25): 12535-12540.
- **Zhang Y-HP\***, Himmel ME, Mielenz JR. 2006. Outlook for cellulase improvement: Screening and selection strategies. *Biotechnology Advances* 24(5): 452-481. (#1 cited paper in 2006)
- **Zhang Y-HP**, Lynd LR\*. 2005. Cellulose utilization by *Clostridium thermocellum*: Bioenergetics and hydrolysis product assimilation. *PNAS* 102: 7321-7325.
- **Zhang Y-HP\***, Lynd LR\*. 2004. Toward an aggregated understanding of enzymatic hydrolysis of cellulose: Non-complexed cellulase systems. *Biotechnology and Bioengineering* 88: 797-824. (#1 cited paper in 2004).

#### IV. SELECTED SERVICES

**Journal Board Member.** Process Biochemistry, Biotechnology for Biofuels, International Journal of Agricultural and Biological Engineering

**Ad hoc journal reviewers (> 500 times for 58 journals):** Nature Biotechnol, Nature Commun, Chem. Rev, JACS, AEM, PNAS, PLoS ONE, MMBR, Biomacromolecules, Langmuir, Biotechnol Bioeng, etc.

**Ad hoc proposal reviewers:** NSF, NIH, DOE, EPA, AFOSR, UK BBSRC, Swiss NSF, ACS Petroleum Research Fund, UC Berkeley BioEnergy Institute, Canada Alberta Funding Consortium, Israel Ministry's of Infrastructure Program, India/Brazil/South Africa trilateral programme (IBSA), FONDECYT, and so on.