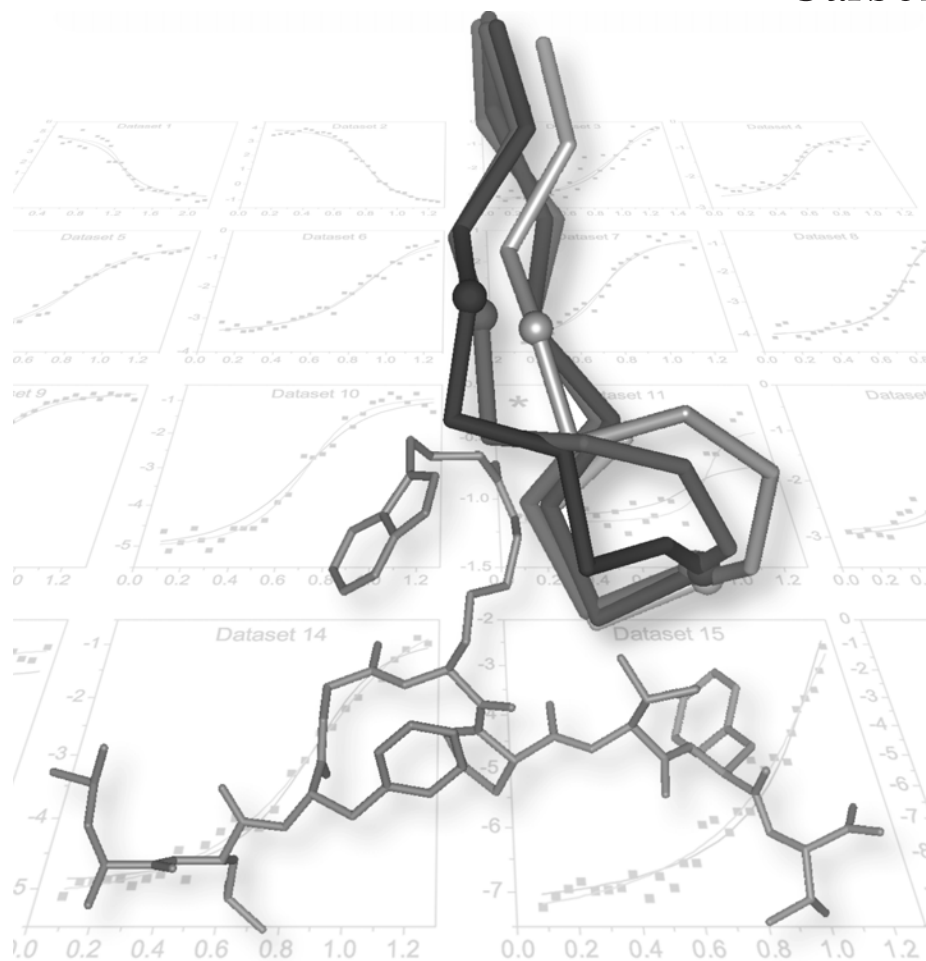


21st Annual Gibbs Conference on Biothermodynamics

Saturday, September 29 - Tuesday, October 2, 2007

Touch of Nature Environmental Center
Southern Illinois University
Carbondale, Illinois



Organizers

Brian M. Baker and Michael T. Henzl

Sponsors

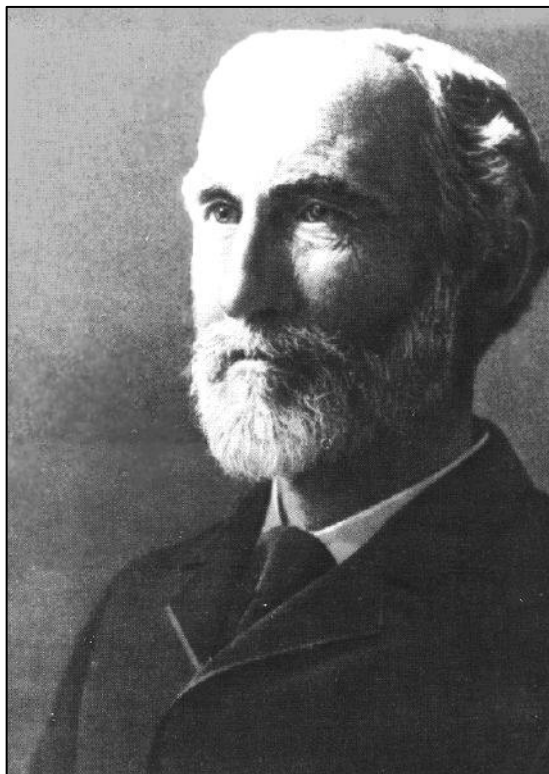
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Cover figure: Global analysis of calorimetric data provides insight into the energetics of conformational changes occurring on recognition of peptidic ligands by $\alpha\beta$ T cell receptors

**The Gibbs Conference on Biothermodynamics
is only possible because of**

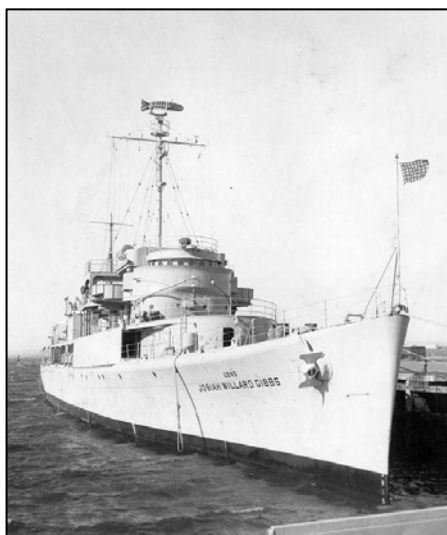


Josiah Willard Gibbs

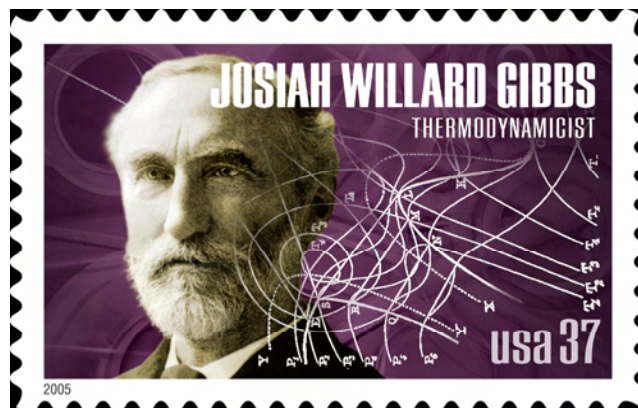
1839 – 1903

“The greatest thermodynamicist of them all”

–John Fenn, Nobel Prize in Chemistry, 2002



USNS Josiah Willard Gibbs, 1958-1971



USPS Gibbs Stamp, released May 5, 2005

History of the Gibbs Conference on Biothermodynamics

Touch of Nature Environmental Center, Carbondale, Illinois

- Fall, 1986 1st discussion of the discipline of Thermodynamics in Biological Systems.
held in Vail, Colorado: Gary Ackers, Wayne Bolen, Ernesto Freire, Stan
Gill, Jim Lee
- Feb, 1987 2nd discussion of the discipline of Thermodynamics in Biological Systems.
held in New Orleans: Gary Ackers, Norma Allewell, Wayne Bolen, Ken
Breslauer, Ken Dill, Ernesto Freire, Stan Gill, Jim Lee

Annual Gibbs Conference on Biothermodynamics

- 1st – 1987 Organizers: Jim Lee and Wayne Bolen
- 2nd – 1988 Organizers: Gary Ackers and Michael Johnson
- 3rd – 1989 Organizers: Susan G. Frasier and Michael Johnson
- 4th – 1990 Organizers: Michael Johnson & Marty Straume
- 5th – 1991 Organizers: Gary Ackers & Tim Lohman
Keynote: Ernesto Freire
- 6th – 1992 Organizers: Jim Lee & Tomasz Heyduk
Keynotes: Serge Timasheff & John Schellman
- 7th – 1993 Organizers: Maurice Eftink and Glen Ramsay
Keynotes: Peter von Hippel and Julian Sturtevant
- 8th – 1994 Organizers: Enrico Di Cera and Madeline Shea
Keynotes: Gary Ackers and Kathleen S. Matthews
- 9th – 1995 Organizers: Kenneth P. Murphy and Michael D. Brenowitz
Keynotes: Victor Bloomfield and Mario Amzel
- 10th – 1996 Organizers: Jonathan B. Chaires and Michael L. Doyle
Keynotes: J. Michael Schurr and Allen Minton
- 11th – 1997 Organizers: Dorothy Beckett and Jack Correia
Keynote: Adrian Parsegian
- 12th – 1998 Organizer: Andy Robertson
Keynote: David Draper
- 13th – 1999 Organizers: Bertrand Garcia-Moreno and John Shriver
Keynotes: Wayne Bolen and Gary Ackers
- 14th – 2000 Organizers: George Turner and Kim Sharp
Keynotes: Steve White (replaced Rodney Biltonen)
- 15th – 2001 Organizers: Margaret A. Daugherty and Luis A. Marky
Keynote: George Rose

16 th – 2002	Organizers: Michael Mossing and George Makhatadze Keynote: Rodney Biltonin
17 th – 2003	Organizers: Vince Hilser and Dick Sheardy Keynote: Jim Lee
18 th – 2004	Organizers: Doug Barrick and Kathleen Hall Keynote: Ignacio Tinoco
19 th – 2005	Organizers: Clay Clark and Trevor Creamer Keynote: Carl Frieden
20 th – 2006	Organizers: Karen Fleming and Rohit Pappu Keynotes: Madeline Shea and Timothy Lohman
21 st – 2007	Organizers: Brian M. Baker and Michael T. Henzl Keynote: Jamie Williamson

In 2002 The Gibbs Conference on Biothermodynamics incorporated as a mechanism of preserving the philosophy and spirit of the meeting. For a published 10 year history see Ackers and Bolen, "The Gibbs Conference on Biothermodynamics: Origins and evolution." *Biophys. Chem.* **64**, p 3-5, 1997.

President:	Jonathan B. Chaires, October, 2006 – October, 2007
President Elect:	Tim Lohman, October, 2007 – October, 2008
Secretary:	Margaret A. Daugherty, October, 2004 – October, 2008
Treasurer:	Michael Johnson, October, 2002 – October, 2008
Past Presidents:	Gary Ackers, October, 2001 – October, 2002 Jack Correia, October, 2002 – October, 2003 Wayne Bolen, October, 2003 – October, 2004 Madeline Shea, October, 2004 – October, 2005 Dorothy Beckett, October, 2005 – October, 2006



The 2006 Gibbs Conference

2. Meeting Schedule

Saturday, September 29, 2007

- 4:00 – 7:00 pm Check In
- 7:00 – 10:00 pm Reception in Indian Room
Light refreshments and beverages

Sunday, September 30, 2007

- 7:30 – 8:30 pm Breakfast in Freeberg Hall
- 8:30 – 8:35 am Welcome: Jonathan Brad Chaires, Gibbs Society President
- 8:35 – 8:40 am Administrative Items: Brian Baker and Mike Henzl

Keynote Address

- 8:40 – 8:45 Introduction: Brian M. Baker
- 8:45 – 9:35 Jamie Williamson (The Scripps Research Institute)
A postproteomic approach to study ribosome assembly
- 9:45 – 10:05 Refreshment break

Session I: Protein Folding and Stability

- Moderator: Scott Crick (Washington University; R. Pappu Lab)
- 10:05 – 10:35 D. Wayne Bolen (University of Texas Medical Branch)
Anatomy of the energetics of osmolyte-induced protein folding/unfolding
- 10:40 – 10:55 Krastyu Ugrinov (University of Notre Dame; P. Clark Lab)
Conformational properties of ribosome-bound GFP
- 11:00 – 11:30 Marina Ramirez-Alvarado (Mayo Graduate School)
The folding and misfolding of immunoglobulin light chains - not all dimers are equal
- 11:35-11:50 Matthew Auton (Rice University; J. Moake Lab)
Unfolding thermodynamics of a three domain fragment of Von Willebrand factor
- 11:55 – 12:25 Neil Zondlo (University of Delaware)
Stereoelectronic effects and aromatic electronic effects in the control of protein structure

12:30 GROUP PICTURE followed by LUNCH

Session II: Membranes and Receptors

- Moderator: Robert J. Hoey (Northern Illinois University, J. Horn Lab)
- 3:15 – 3:45 Adrian Parsegian (National Institutes of Health)
Confined Polymers: in the cell, in the test tube, or in polymer brushes
- 3:50 – 4:05 Emily R. Lamberson (Purdue University; J. Hovis Lab)
Controlling the charge and organization of anionic lipid bilayers: effect of monovalent and divalent ions
- 4:10 – 4:25 Michelle M. Gomes (University of Cincinnati; A. Herr Lab)
Biophysical analyses of the role of glycosylation on IgA1-Fc α RI interactions
- 4:30 – 4:50 Refreshment break
- 4:50 – 5:20 Karen Fleming (Johns Hopkins University)
Folding of outer membrane phospholipase A, a unique membrane embedded enzyme
- 5:25 – 5:40 Kathryn M. Armstrong (University of Notre Dame; B. Baker Lab)
Calorimetric studies of a T cell receptor – ligand interaction and the implications for CDR loop dynamics
- 5:45 – 6:15 Eric J. Sundberg (Boston Biomedical Research Institute)
Energetic cooperativity and conformational flexibility in protein-protein interactions
- 6:30 Dinner in Freeberg Hall
- 8:00 Posters and Beer/Wine I in Sledgefoot Hall
First author last names L – Z

Monday, October 1, 2007

7:30 – 8:30 Breakfast in Freebird Hall

Session III: Enzymes and Dynamics

Moderator: Rebecca L. Davis-Harrison (University of Illinois-UC; J. Morrissey Lab)

8:30 – 9:00 David A. Johnson (University of California Riverside)
Time-resolved fluorescence anisotropy and the measurement of protein conformational flexibility

9:05 – 9:35 Anne-Frances Miller (University of Kentucky)
Nitroreductase, a plastic explosive degrading protein

9:40 – 9:55 Andrew Bigley (Texas A&M University; G. Reinhart Lab)
A new tail in allostery: a reexamination of the role of the N-terminus of glycogen phosphorylase b in activation by AMP

10:00 – 10:20 Refreshment Break

10:20 – 10:50 Greg Reinhart (Texas A&M University)
Allosteric communication in a homo-tetramer: the inside story

10:55 – 11:10 Rebecca Strawn (Princeton University; J. Carey Lab)
Allosteric activation of arginine repressor

11:15 – 11:30 Michael J. Harms (Johns Hopkins University; B. Garcia-Moreno Lab)
Contribution of water penetration and conformational fluctuations to pKa values of internal ionizable groups

11:35 – 12:05 Jeffrey W. Peng (University of Notre Dame)
Functional motions of modular proteins - glimpses from NMR

12:15 Lunch

12:15 Gibbs business meeting: *all previous organizers please attend*

Session IV: Frontiers in Biophysics

- Moderator: Francis Insaïdo (University of Notre Dame; B. Baker lab)
- 3:30 – 4:00 Carlos Bustamante (University of California Berkeley)
Recent advances in single molecule manipulation in biophysics
- 4:05 – 4:20 Katrina L. Schweiker (Pennsylvania State University; G. Makhatadze Lab)
Computational design of the Fyn SH3 domain with increased stability through optimization of surface charge-charge interactions
- 4:25 – 4:55 Ishita Mukerji (Wesleyan University)
Spectroscopic and molecular dynamics evidence for a sequential mechanism for the A to B transition in DNA
- 5:00 – 5:20 Refreshment break
- 5:20 – 5:50 Yuri Lyubchenko (University of Nebraska)
Dynamics, mechanics and stability of synaptic SfiI-DNA complex: single molecule studies
- 5:55 – 6:10 Ellen Kloss (Johns Hopkins University; D. Barrick Lab)
Mapping of interfacial and intrinsic stabilities of leucine-rich repeat units in YopM
- 6:15 – 6:30 Nichola C. Garbett (University of Louisville; B. Chaires Lab)
Calorimetry outside the box: a new window into the plasma proteome
- 6:45 Dinner in Freebird Hall
- 8:00 Posters and Beer/Wine II in Sledgefoot Hall
First author last names A – K