LOOKING IN THE RIGHT DIRECTION

CARL WOESE

AND THE NEW BIOLOGY

09.18 – 20, 2015

ALICE CAMPBELL ALUMNI CENTER

GO.ILLINOIS.EDU/NEWBIOLOGY

#WoeseIGB

“IF I HAVE SEEN FURTHER THAN OTHERS, IT IS BECAUSE I WAS LOOKING IN THE RIGHT DIRECTION.”

CARL R. WOESE

WELCOME

THE CARL R. WOESE INSTITUTE FOR GENOMIC BIOLOGY IS PROUD TO HOST "LOOKING IN THE RIGHT DIRECTION: CARL WOESE AND THE NEW BIOLOGY" TO MARK THE RENAMING OF OUR INSTITUTE.

This symposium will highlight not only some of the historical aspects of work on microbiology, evolution and molecular biology as researched by Carl Woese and colleagues, but also some of the most exciting modern research directions that have been inspired or impacted by his work and ideas.

We're excited to have you join us and look forward to engaging with you as we hear from our esteemed presenters over the course of the symposium.

BEST WISHES,
The Organizing Committee

ISAAC CANN · NIGEL GOLDENFELD · ZAN LUTHEY-SCHULTEN · RACHEL WHITAKER

9
18
FRIDAY
15

AGENDA

More about Penny
Chisholm on page 10

PUBLIC LECTURE

7:30 P.M.

"Tiny Cells, Global Impact: A Journey of Discovery with a Microbe from the Sea"

Penny Chisholm

Lee and Geraldine Martin Professor of Environmental Studies

Massachusetts Institute of Technology

9 19 15

SATURDAY

AGENDA

BREAKFAST

7:30 A.M.

OPENING REMARKS

8:30 A.M.

Peter Schiffer
Vice Chancellor for Research
University of Illinois

SESSION 1: EVOLUTION AND THE TREE OF LIFE — SESSION CHAIR: ZAN LUTHEY-SCHULTEN

8:45 - 9:20 A.M.

"Pushing the Limits of Diversity Through the Lens of Woese"

Mitch Sogin
Department of Molecular Biology, Cell Biology and Biochemistry
Brown University

9:20 – 9:55 A.M.

"Phylogenomics and the Tree of Life: Progress and Challenges"

Simonetta Gribaldo
Department of Microbiology
Institut Pasteur, Paris, France

BREAK

9:55 – 10:30 A.M.

"The Alien-Looking Codon Usages of Recently Acquired Genes Are Not Alien"

Gary Olsen
Department of Microbiology
Biocomplexity Theme, Carl R. Woese Institute for Genomic Biology
University of Illinois

10:30 – 10:45 A.M.

SESSION 2: RIBOSOMES AND THE GENETIC CODE — SESSION CHAIR: ZAN LUTHEY-SCHULTEN

10:45 – 11:20 A.M.

"Ribosome Origins and Evolution"

George Fox
Department of Biology and Biochemistry
University of Houston

11:20 – 11:55 A.M.

"Inferring the Complexities of Early Life From Simple Facts—A Woeseian Approach to Evolution and Universal Biology"

Nigel Goldenfeld
Department of Physics
Biocomplexity Theme Leader, Carl R. Woese Institute for Genomic Biology
University of Illinois

11:55 – 12:30 P.M.

"Bringing Genome Evolution Into Focus Through the Lens of CRISPR-Cas"

Rachel Whitaker
Department of Microbiology
Biocomplexity Theme, Carl R. Woese Institute for Genomic Biology
University of Illinois

LUNCH

12:30 – 1:30 P.M.

SESSION 3: MICROBES AROUND US — SESSION CHAIR: BRUCE FOUKE

1:30 – 2:05 P.M.

"A National Microbiome Agenda"

Jo Handelsman
Associate Director for Science
White House Office of Science and Technology Policy

2:05 – 2:40 P.M.

"Carl Woese and the Beginnings of Metagenomics"

Norman Pace
Department of Molecular, Cellular and Developmental Biology
University of Colorado Boulder

SESSION 4: MICROBES WITHIN US — SESSION CHAIR: BRUCE FOUKE

BREAK

2:40 –3:15 P.M.

"From Illinois to the Sea: Novel Microbiome Diversity in Marine Symbioses"

Colleen Cavanaugh
Department of Organismic and Evolutionary Biology
Harvard University

3:15 – 3:30 P.M.

BREAK

3:30 – 4:05 P.M.

"From the Human Microbiome Project to the Earth Microbiome Project"

Rob Knight
Departments of Pediatrics and Computer Science & Engineering
University of California, San Diego

4:05 – 4:40 P.M.

"Chromosome Evolution: Looking in the Opposite Direction"

Harris Lewin
Department of Evolution and Ecology
University of California, Davis

BREAK

4:40 – 6:00 P.M.

DINNER RECEPTION

6:00 P.M.

Carl R. Woese Institute for Genomic Biology
1206 W. Gregory Drive, Urbana

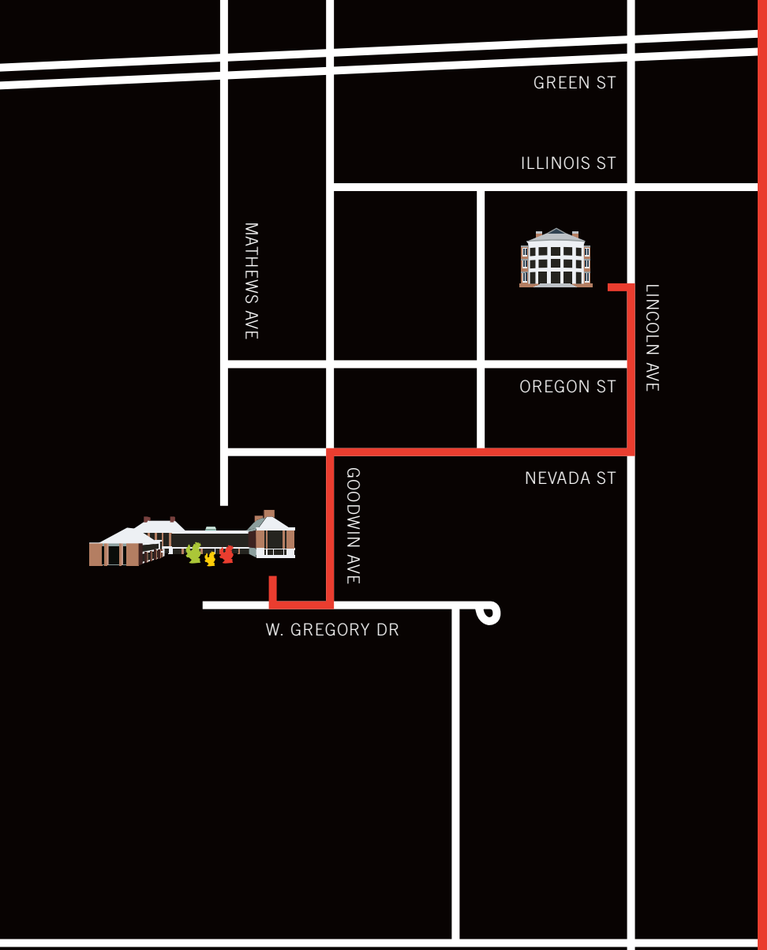
DINNER PROGRAM

7:00 P.M.

Archaea Tree Ensemble

Gene Robinson, Introduction
Director, Carl R. Woese Institute for Genomic Biology
Department of Entomology
University of Illinois

Larry Gold, Dinner Remarks
Department of Molecular, Cellular and Developmental Biology
University of Colorado Boulder



WALKING DIRECTIONS

ALICE CAMPBELL ALUMNI CENTER TO CARL R. WOESE IGB
11 MIN

ALICE CAMPBELL ALUMNI CENTER
601 S LINCOLN AVE, URBANA, IL 61801

Head south on S Lincoln Ave toward W Oregon St
0.1 mi

Turn right onto W Nevada St
0.2 mi

Turn left onto S Goodwin Ave
0.1 mi

Turn right onto W Gregory Dr
IGB will be on the right

CARL R. WOESE IGB
1206 W GREGORY DR, URBANA, IL 61801

9/20/15

SUNDAY

AGENDA

BREAKFAST

7:30 – 8:30 A.M.

SESSION 5: THE ARCHAEA

8:30 – 9:05 A.M.

"Ribosomal RNA: The Kernel of Life"

Harry Noller
Department of Molecular, Cell & Developmental Biology
University of California, Santa Cruz

SESSION CHAIR: ISAAC CANN

BREAK

9:40 – 10:00 A.M.

9:05 – 9:40 A.M.

"Towards a Computational Model of a Methane Producing Archaeum"

Zan Luthey-Schulten
Department of Chemistry
Biocomplexity Theme,
Carl R. Woese Institute for Genomic Biology
University of Illinois

SESSION 6: THE FUTURE

SESSION CHAIR: ISAAC CANN

10:00 – 10:35 A.M.

"Synthetic Biology: Life Redesigned"

Jim Collins
Department of Biological Engineering
Massachusetts Institute of Technology

10:35 – 11:10 A.M.

"Inspired by Carl: Exploring the Microbial Dynamics Within"

Larry Smarr
Jacobs School of Engineering,
Department of Computer Science and Engineering
University of California, San Diego

DISCUSSION / CLOSING REMARKS

11:10 A.M.

Gene Robinson
Director,
Carl R. Woese Institute for Genomic Biology
Department of Entomology
University of Illinois

LUNCH

11:30 A.M.

SPEAKERS

FRIDAY PUBLIC LECTURE

SATURDAY SESSION 1

FRIDAY PUBLIC LECTURE

PENNY CHISHOLM

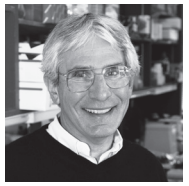
Department of Biology
Massachusetts Institute of Technology

"Tiny Cells, Global Impact: A Journey of Discovery with a Microbe from the Sea"

The overarching goal of the Chisholm lab's research is to advance understanding of the ecology and evolution of microbes in the oceans and how they influence global biogeochemical cycles. Over the past few decades they have focused attention on the cyanobacterium *Prochlorococcus*, which is the smallest and most abundant microbe in ocean ecosystems—sometimes accounting for half of the total photosynthetic biomass. This minimal phototroph can create a living cell with 1700 genes, sunlight, and inorganic compounds.

They are developing *Prochlorococcus* as a model system for studying life across all spatial scales, from genomes to the biosphere, and across evolutionary and daily time scales. Expanding systems biology across these dimensions will help better elucidate the fundamental principles shaping life processes and the biosphere.

SATURDAY SESSION 1: EVOLUTION AND THE TREE OF LIFE



MITCH SOGIN

Department of Molecular Biology, Cell Biology and Biochemistry
Brown University

"Pushing the Limits of Diversity Through the Lens of Woese"

Sogin combines training in molecular evolution and microbiology to investigate the diversity and evolution of single-cell organisms. Sogin's pioneering use of molecular phylogeny produced the reference framework for understanding the evolution of microbial eukaryotes. He documented the earliest diverging eukaryotic lineages, provided the first evidence of a specific link between animals and fungi to the exclusion of all other eukaryotes, discovered a novel assemblage of heterotrophic and photosynthetic eukaryotes (the Stramenopiles), and demonstrated that the AIDS pathogen *Pneumocystis* shares a recent common evolutionary history with fungi instead of with parasitic protozoa that cause malaria.

SIMONETTA GRIBALDO

Department of Microbiology
Institut Pasteur, Paris, France

"Phylogenomics and the Tree of Life: Progress and Challenges"

The Microbial Phylogenomics group explores the biodiversity of microorganisms through phylogenomics approaches. They are particularly interested in reconstructing the evolutionary relationships among organisms at large-taxonomic scale (Order, Phylum, Domain, Tree of Life), highlighting the existence of novel microbial lineages, studying the origin and evolutionary history of key cellular processes, and investigating major transitions in the history of life on our planet.

GARY OLSEN
Department of Microbiology
Biocomplexity Theme,
Carl R. Woese Institute for Genomic Biology
University of Illinois

"The Alien-Looking Codon Usages of Recently Acquired Genes Are Not Alien"

Olsen's research focuses on the functions, evolutionary histories and structures of genes and proteins. Mainly based in genomics, there is an additional emphasis on comparative genomics and genome evolution. His approach is a combination of experimental work and computational analyses of genomes and proteins.

SATURDAY SESSION 2: RIBOSOMES AND THE GENETIC CODE

GEORGE FOX
Department of Biology and Biochemstry
University of Houston

"Ribosome Origins and Evolution"

The Fox laboratory engages in a combination of basic and associated applied research. Much of their work focuses on RNA, including studies of structure and evolution. The applied work relates primarily to applications of RNA technology in space flight and environmental monitoring. The laboratory combines theoretical and experimental work. They commonly use the modern tools of microbiology, molecular biology and bioinformatics and high-speed computation.

NIGEL GOLDENFELD
Department of Physics
Biocomplexity Theme Leader,
Carl R. Woese Institute for Genomic Biology
University of Illinois

"Inferring the Complexities of Early Life From Simple Facts—A Woeseian Approach to Evolution and Universal Biology"

Nigel's research explores how patterns evolve in time; examples include the growth of snowflakes, the microstructures of materials, the flow of turbulent fluids, the dynamics of geological formations, and even the spatial structure of ecosystems. Nigel's interests in emergent and collective phenomena extend from condensed matter physics, where he has contributed to the modern understanding of high temperature superconductors, to biology, where his current work focuses on evolution, microbial ecology and astrobiology.

RACHEL WHITAKER
Department of Microbiology
Biocomplexity Theme,
Carl R. Woese Institute for Genomic Biology
University of Illinois

"Bringing Genome Evolution Into Focus Through The Lens of CRISPR-Cas"

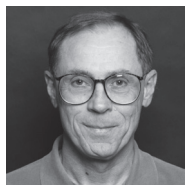
The Whitaker lab focuses on the evolutionary ecology of microbial populations. They combine field sampling of natural populations with culture and non-culture based genetic and genomic analyses. Currently they are working on understanding how the interactions between basic population genetic parameters (mutation, selection, recombination and genetic exchange, neutral genetic drift, and biogeography) shape diversity, promote ecological differentiation, and lead to speciation in the microbial world. Ultimately they will develop a comparative approach, describing natural population dynamics of different species across spatial and temporal scales, with a particular interest in how population structures reflect the unique biology and ecology of organisms in the Archaeal domain.

SATURDAY SESSION 3: MICROBES AROUND US

JO HANDELSMAN
Associate Director for Science
White House Office of Science and Technology Policy

"A National Microbiome Agenda"

Dr. Handelsman helps to advise President Obama on the implications of science for the Nation, ways in which science can inform U.S. policy, and on Federal efforts in support of scientific research. Dr. Handelsman is an expert in communication among bacteria that associate with soil, plants, and insects and helped pioneer the field of metagenomics, bridging agricultural and medical services. Dr. Handelsman is also recognized for her research on science education and women and minorities in science.



NORMAN PACE
Department of Molecular, Cellular and Developmental Biology
University of Colorado Boulder

"Carl Woese and the Beginnings of Metagenomics"

Pace Lab research falls into two broad categories, one being the study of RNaseP, a catalytic RNA that functions in the conversion of pre-tRNA to functional tRNA, and its associated proteins through biochemical and biophysical methods. The other category researches the use of molecular methods such as cloning and sequencing to detect microorganisms in various environments.

SATURDAY SESSION 4: MICROBES WITHIN US

COLLEEN CAVANAUGH
Department of Organismic and Evolutionary Biology
Harvard University

"From Illinois to the Sea: Novel Microbiome Diversity in Marine Symbioses"

Cavanaugh's research primarily involves the study of symbioses of bacteria in marine invertebrates from deep-sea hydrothermal vents, methane seeps, and coastal reducing sediments. Specific emphasis is placed on the characterization of metabolic and genetic capabilities of symbionts, evolutionary relationships with free-living bacteria, and co-evolution of host and symbiont.

ROB KNIGHT
Departments of Pediatrics and Computer Science & Engineering
University of California, San Diego

"From the Human Microbiome Project to the Earth Microbiome Project"

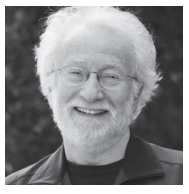
The Knight Lab addresses a variety of questions surrounding environmental and host-associated microbiota. The lab develops tools and molecular and microbiological techniques to support their projects, such as implementing a highly efficient, semi-automated pipeline for DNA extraction, PCR amplification, and high-throughput sequencing of microbial samples using the Illumina platform, as well as the development of new bioinformatic tools and resources to facilitate processing, analysis, and visualization of large data sets. Encompassing environmental, human-associated and animal-associated microbiota, the lab has launched programs to characterize the human microbiome on a massive scale, and to elucidate the evolutionary processes that govern assembly of the vertebrate microbiome. A further research component in forensic science uses a mouse model system to help understand how bacterial and microbial eukaryotic communities change during decomposition.

HARRIS LEWIN
Department of Evolution and Ecology
University of California, Davis

"Chromosome Evolution: Looking in the Opposite Direction"

Professor Lewin's research interest is in mammalian genome evolution. He and his collaborators are studying how mammalian chromosomes evolve and the role of chromosome rearrangements in adaptation, speciation and the origins of cancer. Lewin's earlier research in immunogenetics and comparative genomics led to the identification of a gene responsible for resistance and susceptibility to bovine leukemia virus infection, the development of high-density comparative maps for mammalian genomes, and co-discovery of a gene affecting milk fat composition. In addition, his group produced the first large-scale cattle cDNA and oligo microarrays, which were used to study the genomic effects of nuclear transfer cloning, the development and involution of the mammary gland, and the dietary effects on gene expression during the periparturient period. Lewin was also the founding Director of the Institute for Genomic Biology at the University of Illinois.

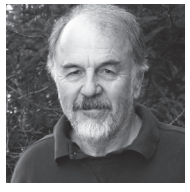
SATURDAY DINNER PROGRAM



LARRY GOLD
Department of Molecular, Cellular and Developmental Biology
University of Colorado Boulder

The Gold lab began with basic research on bacteria and bacteriophage, then shifted focus to human disease following the invention of the SELEX process in 1989. SELEX (Systematic Evolution of Ligands by Exponential enrichment) is a combinatorial chemistry methodology in which vast numbers of oligonucleotides (DNA, RNA, or unnatural compounds) are screened rapidly for specific sequences that have appropriate binding affinities and specificities toward any target. SELEX also has been used to identify new ribozymes and deoxyribozymes. The Gold Lab currently focuses on the utilization of biological and information technology to improve healthcare.

SUNDAY SESSION 5: THE ARCHAEA



HARRY NOLLER

Department of Molecular, Cell & Developmental Biology
University of California, Santa Cruz

"Ribosomal RNA: The Kernel of Life"

Noller and his lab use a wide range of experimental and computational approaches, including x-ray crystallography, single-molecule FRET, genetics and biochemistry to study the structure and mechanisms of action of the ribosome, the very large cellular ribonucleoprotein complex responsible for the translation of the genetic code and synthesis of proteins in all organisms. Noller studies how the core biological functions of the ribosome, including aminoacyl-tRNA selection, peptide bond formation and translocation, are based on its ribosomal RNA (rRNA). His lab also researches translocation (the coupled movement of mRNA and tRNA through the ribosome during the elongation phase of protein synthesis); the mechanism of action of the mRNA helicase activity of the ribosome; the mechanism of translation termination; the forces exerted by the ribosome during protein synthesis; and the mechanism of translation initiation by IRES elements.

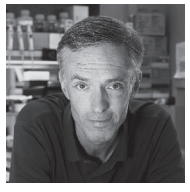
ZAN LUTHEY-SCHULTEN

Department of Chemistry
Biocomplexity Theme,
Carl R. Woese Institute for Genomic Biology
University of Illinois

"Towards a Computational Model of a Methane Producing Archaeum"

The Luthey-Schulten group focuses on the energy landscapes of biological molecules and exploring the evolution of structure function/folding. They investigate into the areas of evolution of translation, origins of life, physical bioinformatics, prediction of protein structure and function with QR profiles, docking with steered molecular dynamics (SMD), VMD/ multiple alignment evolutionary analysis tools, and protein folding of hybrid molecular dynamics.

SUNDAY SESSION 6: THE FUTURE



JIM COLLINS

Department of Biological Engineering
Massachusetts Institute of Technology

"Synthetic Biology: Life Redesigned"

The Collins research group works in synthetic biology and systems biology, designing and constructing synthetic gene networks for a variety of biotechnology and medical applications, with a particular focus on the detection and treatment of infectious diseases. They also use network biology approaches to study antibiotic action, bacterial defense mechanisms, and the emergence of antibiotic resistance.

LARRY SMARR

Jacobs School of Engineering, Department of Computer Science and Engineering
University of California, San Diego

"Inspired by Carl-Exploring the Microbial Dynamics Within"

Smarr drives major developments in planetary information infrastructure, begun during his previous experience as founding Director of the National Center for Supercomputing Applications and the National Computational Science Alliance, including contributions to the Internet, the Web, scientific visualization, virtual reality, collaboratories, global telepresence and Green IT. His views have been quoted in *Science, Nature,* the *New York Times, Wall Street Journal, Time, Newsweek, Wired, Fortune,* and *Business Week*. Smarr served as principal investigator on NSF's OptIPuter project and currently is principal investigator of the Moore Foundation's CAMERA project and co-principal investigator on NSF's GreenLight project.

“IMAGINE WALKING OUT IN THE COUNTRYSIDE AND NOT BEING ABLE TO TELL A SNAKE FROM A COW FROM A MOUSE FROM A BLADE OF GRASS,

THAT’S BEEN THE LEVEL OF OUR IGNORANCE.”

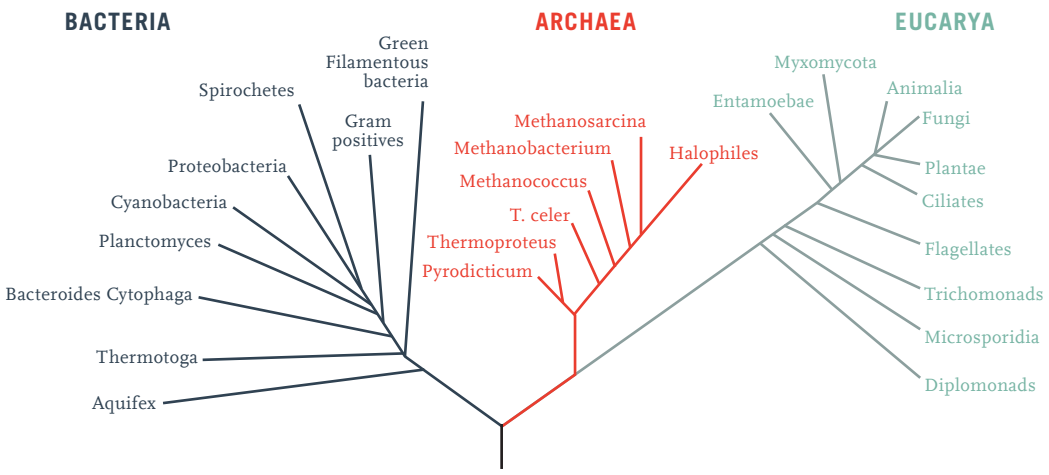
CARL R. WOESE

CARL R. WOESE

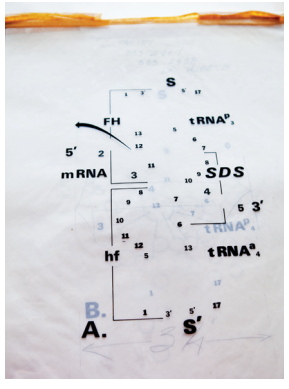
JULY 15, 1928 – DECEMBER 30, 2012

Carl R. Woese was the first scientist to map out the evolutionary history of all life on Earth. In so doing, he not only showed that all known life is related and descended from a common ancestral state, but he also overturned one of the major dogmas of biology with his discovery of the archaea, the third domain of life. CONTINUED

CARL R. WOESE



Woese and his colleagues wrote two papers, published in 1977, that challenged the universally held assumption about the basic structure of the tree of life. They reported that the microbes now known as archaea were as distinct from bacteria as plants and animals are. Prior to this finding, scientists had grouped archaea together with bacteria, and asserted that the tree of life had two main branches – Bacteria (which they called Prokarya), and everything else (Eukarya). Because of Woese's work, it is now widely agreed that there are three, not two, primary divisions of life – Eukarya, Bacteria, and Archaea. This classification scheme represents one of the 20th century's landmark achievements in science and has fundamentally changed our understanding of evolutionary biology.

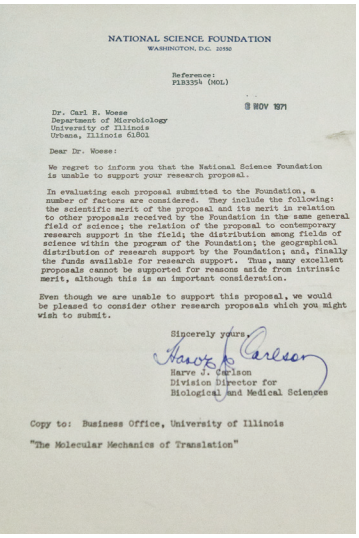


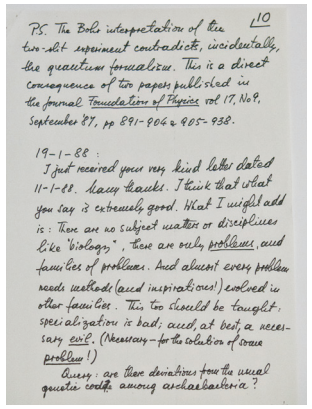
The discovery stemmed from Woese's painstaking analysis of the ribosome, a protein-building machine abundant in almost all living cells. Rather than classifying organisms by observing their physical traits, as others had done, Woese looked for evolutionary relationships by comparing genetic sequences. He focused on a subunit of the ribosome, and found that the ribosomal sequences of some methane-producing microbes formed a new group that was distinct from bacteria and from all other organisms. He named this group the Archaeabacteria (which was later shortened to Archaea).

By basing his classification on the sequences of molecules involved in the cell's earliest machinery for expressing genes, rather than purely physiological characteristics, Woese innovated a method to quantify evolutionary change, a strategy for investigating the origin of life, and a scientifically rigorous way to identify and classify all organisms. This has been especially transformative in the case of microbes, the vast majority of which cannot be cultured in the laboratory, but which represent the principal components of the Earth's biosphere.

Born July 15, 1928, in Syracuse, N.Y., Woese earned bachelor's degrees in math and physics from Amherst College in 1950 and a PhD in biophysics at Yale University in 1953. He studied medicine for two years at the University of Rochester, spent five years as a postdoctoral researcher in biophysics at Yale, and worked as a biophysicist at the General Electric Research Laboratory in Schenectady, N.Y. He joined

CARL R. WOESE




PS. The Bohr interpretation of the 10
two-slit experiment contradicts, incidentally, the quantum formalism. This is a direct consequence of two papers published in the Journal Foundations of Physics vol 17, No 9, September '87, pp 891-904 & 905-938.

19-1-88 :
I just received your very kind letter dated 11-1-88. Many thanks. I think that what you say is extremely good. What I might add is: There are no subject matter or disciplines like "biology," there are only problems, and families of problems. And almost every problem needs methods (and inspirations!) evolved in other families. This too should be taught: specialization is bad; and, at best, a necessary evil. (Necessary – for the solution of some problem!)
Query: are there deviations from the usual genetic code among archaebacteria?

Images of Woese and his lab in Morrill Hall on the University of Illinois campus (previous page), including the coveted Archaea Masters green golfing jacket, presented to the winner of a tournament held annually. Additional images with colleagues are seen to the left, as well as pages from his notebook. The upper left shows Woese with the King and Queen of Sweden, receiving the 2003 Crafoord prize for the discovery of Archaea.

the faculty of the University of Illinois at Urbana-Champaign in 1964 as professor of microbiology, serving in that capacity for the remainder of his career, nearly 50 years, during which he became a founding member of the Institute for Genomic Biology. His many accolades include the MacArthur Foundation "genius" award, election to the National Academy of Sciences, the National Medal of Science, the Crafoord Prize in Biosciences from the Royal Swedish Academy of Sciences, and the Leeuwenhoek Medal from the Dutch Royal Academy of Science, the highest honor bestowed in the field of microbiology. Woese was also a foreign member of the Royal Society and held the Stanley O. Ikenberry Endowed Chair at Illinois.

Woese's work was an early forerunner of today's genomic biology, with many extensions that continue to influence path-breaking work in microbiology, ecology and health sciences. As a memorial to his legacy, the Institute for Genomic Biology was officially renamed in 2014 as the Carl R. Woese Institute for Genomic Biology.

WOESE FELLOWSHIPS

The Carl R. Woese Institute for Genomic Biology (IGB) at the University of Illinois at Urbana-Champaign is proud to announce the Carl R. Woese Postdoctoral Fellowship Program.

As a faculty member of the University of Illinois for nearly 50 years and a founding member of the Institute for Genomic Biology, we honor the legacy of Carl R. Woese and his discovery of the third domain of life with the renaming of our institute to the Carl R. Woese Institute for Genomic Biology and the establishment of the Woese Fellowship.

The Woese Fellows will be truly exceptional young scholars who have completed their Ph.D. within the last several years, and are at the forefront of their field in evolution and the emergence of life, or other rapidly developing areas of quantitative biology and genomics. Woese Fellows will combine a quantitative outlook on biology with creative, possibly interdisciplinary, approaches to deep scientific questions, and will be able to take advantage of the stimulating IGB environment to carry out independent and collaborative research in a field of genomic biology. Woese Fellows will typically spend two to three years conducting research in one or more of the several research themes in the Institute. An annual salary of $55,000 will be provided, with a yearly stipend of $10,000 to be used in support of research.

The closing date for all positions is December 15, 2015. Fellows will be announced on or about January 15, 2016. To apply, please visit http://go.illinois.edu/woesefellow.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer. The Carl R. Woese Institute for Genomic Biology is a pioneer in advancing life sciences research with program areas in systems biology, cellular and metabolic engineering, and genome technology. Visit www.igb.illinois.edu for additional information.

ARCHAEA
TREE
ENSEMBLE

TO LEARN MORE ABOUT THE ENSEMBLE, VISIT ARCHAEA TREE ENSEMBLE'S WEBSITE, WWW.ARCHAEATREE.COM. FOLLOW THE ENSEMBLE ON FACEBOOK (ARCHAEATREE), TWITTER (@ARCHAEATREE), AND SOUNDCLOUD, (SOUNDCLOUD.COM/ARCHAEA-TREE-ENSEMBLE).

THE ARCHAEA TREE ENSEMBLE (ATE) IS A DYNAMIC TRIO THAT CENTERS THEIR PERFORMANCES ON CONCEPTS OF PLAY, CURIOSITY, AND BEAUTY.

Through their unique and malleable instrumentation, ATE invites audiences to explore music through cross-disciplinary shows and interactive programs that draw from classical, contemporary, and folk genres alike. The ensemble is comprised of harpist, Erin Brooker-Miller, percussionist, Andy Miller, and flutist, Jennifer Shanahan.

Founded in 2013, the ensemble has performed in art galleries, schools, concert halls, and other unconventional venues throughout the United States. Their inaugural show took place at the Indi-Go Artist Co-op, during which audience members wandered through the gallery, enjoyed refreshments, and were able to interact freely with the musicians as the performance took place. This welcoming and interactive atmosphere set the tone for the work since achieved by ATE. The ensemble was most recently heard at AZULE (Hot Springs, NC), Constellation Chicago, the Milwaukee Art Museum, and the Champaign Public Library.

The Archaea Tree Ensemble aims to generate new works through collaborating with living artists of all mediums. In May 2015, the ensemble launched its first iteration of Troublesome Gap, an innovative and collaborative summer retreat for composers held at the unique artist retreat center AZULE in the Blue Ridge Mountains. The retreat aims at confronting the many forces that create separation in musical pursuits; the separation between artists and society, performers and composers, classical and traditional music, even timbres among instruments. Five up-and-coming composers were invited to write original compositions for Troublesome Gap, during which ATE worked closely with them to rehearse, record, and premiere the new works. At Troublesome Gap, the ensemble was joined by award-winning composer, Robert Paterson, the photography and videography team, Studio DíLitt, and recording engineer, Jeff Zahos.

IGB OVERVIEW

The Carl R. Woese Institute for Genomic Biology (IGB) brings together diverse experts to address formidable challenges using genomics. Since 2007, our Institute—an experiment in transdisciplinary research—has yielded many discoveries and scientific advancements, continually supporting the hypothesis that the whole is greater than the sum of its parts.

IGB members are drawn from a broad range of disciplines, including the life sciences, social sciences, engineering, law and business. They remain an integral part of home departments while pursuing collaborative research projects in the Institute's state-of-the-art, $75-million, 186,000-square-foot facility. Theme leaders help coalesce members into thematic research groups housed in large shared laboratories.

Through innovative outreach and education programs, the IGB invites people of all ages to learn about and participate in transdisciplinary research. The IGB hosts accessible, hands-on educational activities for children and their families, as well as workshops and events designed to engage groups through relevant genomic research.

SPONSOR INFORMATION

The Carl R. Woese Institute for Genomic Biology gratefully appreciates the following sponsors of this symposium:

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